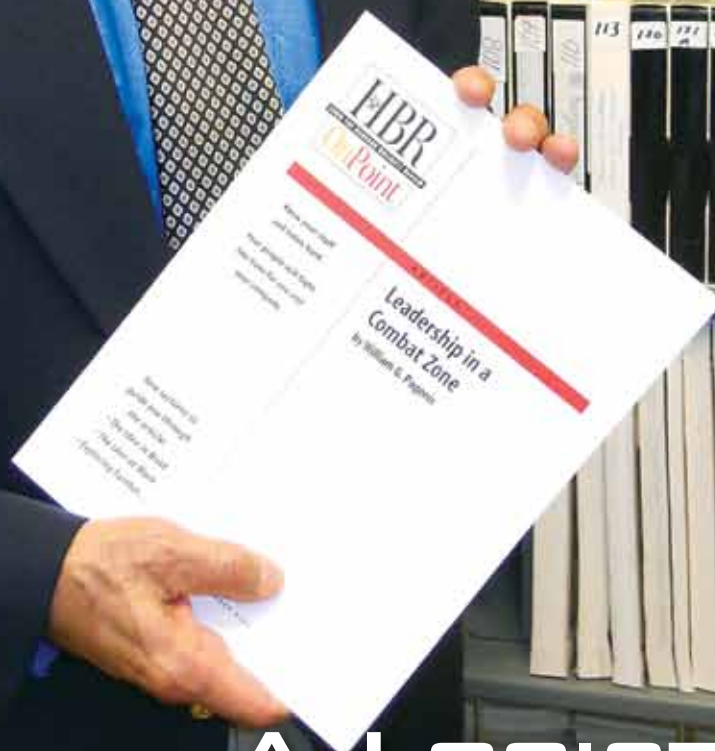


SEPTEMBER-OCTOBER 2010

ARMY SUSTAINMENT

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A LOGISTICIAN'S LEGACY COMES TO ALU

The Financial Management Campaign Plan
Building "Log Nation" in the U.S. Central Command
Evolution of Petroleum Support in the CENTCOM Area of Responsibility

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PB 700-10-5 Headquarters, Department of the Army

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Cover: Lieutenant General (Ret.) William G. "Gus" Pagonis poses amid the personal archives he donated to the Army Logistics University (ALU) Library on 17 May 2010. General Pagonis was the lead logistician during the Persian Gulf War of 1990 to 1991. His carefully preserved record of his role in that conflict will allow ALU students and researchers to study and benefit from his lessons learned in one of the most complicated logistics operations in Army history. The article beginning on page 32 discusses his donation, which will be the foundation of ALU's new Senior Sustainer's Collection. (Photo by Julianne E. Cochran, Army Sustainment)



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Logistics Officer Corps Update: Blending Functional and Multifunctional Expertise

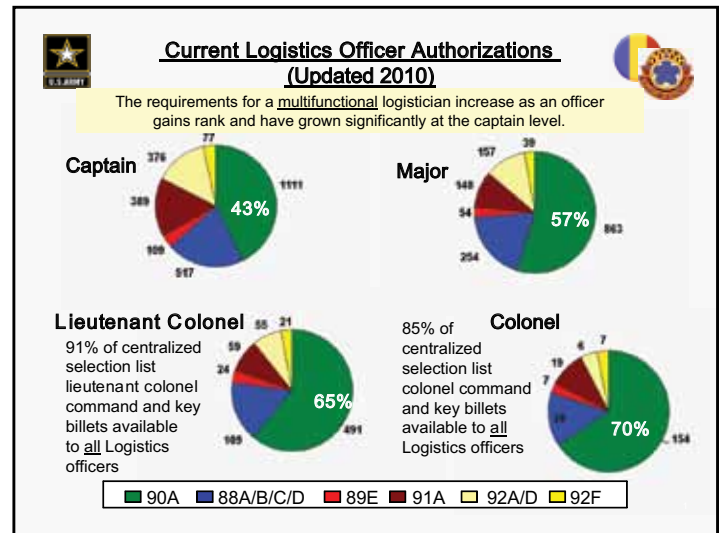
BY LIEUTENANT COLONEL MARSHALL N. RAMSEY AND LIEUTENANT COLONEL TIM GILHOOL

On 1 January 2008, the Logistics Corps as a branch became a reality. Long before 2008, quartermaster (QM), ordnance (OD), and transportation (TC) officers had served for a generation in multifunctional logistics positions in legacy forward, main, and corps support battalions. Today, after approximately 9 years of sustaining deployments and combat operations across the globe, the planning, coordination, synchronization, and execution of multifunctional logistics is definitely well within the comfort zone for this current generation of officers.

With that said, confusion seems to abound in the field as to what happens to the functional logistics skill set (QM, OD, and TC) that an officer brings to the table. After being inculcated for their first 3 to 5 years as a proud member of one of the regiments—QM, OD, and TC—does that knowledge vanish after graduation from the Combined Logistics Captains Career Course (CLC3)?

Every Logistics Officer Has a Functional Area

The answer to that question is a resounding “No!” Despite the advent of the Logistics (LG) branch and the proliferation of forward support companies (FSCs) across our formations, a requirement,

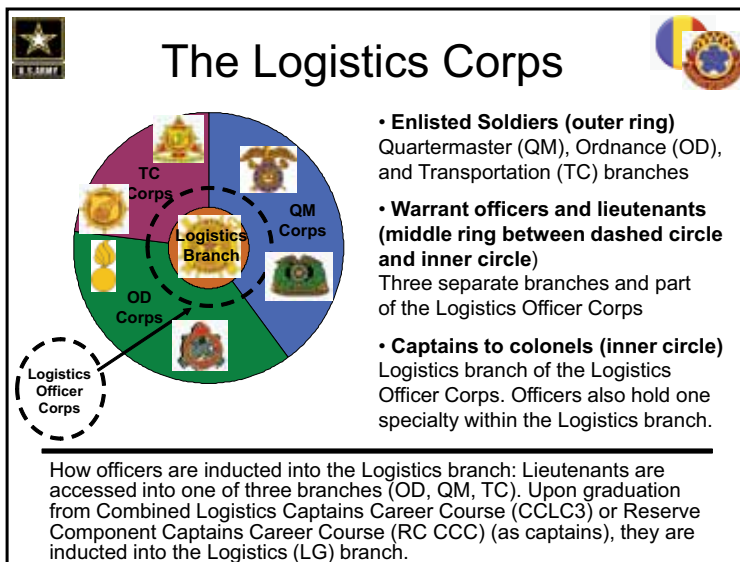


codified in numerous modification tables of organization and equipment and tables of distribution and allowances, still exists for functional QM, OD, and TC officers at the captain, major, lieutenant colonel, and even colonel ranks.

What this means for career path and professional development purposes is that LG officers must be aggressive in self-study and look for developmental opportunities to sharpen their functional skills. Human resources managers at the Army Human Resources Command and the Senior Leader Development Office can help by ensuring that officers have opportunities to rotate between multifunctional jobs and functional jobs as much as possible throughout their careers. This becomes much harder to do the more senior the officer is, but based on an officer’s own desires and the needs of the Army, it must be a factor in future assignments.

Career Paths of Logistics Officers

Logistics officers, regardless of what regiment they were accessed from, become Logistics Corps officers upon graduation from CLC3—period. The intent, as developed by Lieutenant General Mitchell H. Stevenson during his tenure as the commanding general of the



continued on page 54

Building “Log Nation” in the U.S. Central Command

BY MAJOR GENERAL KENNETH S. DOWD

Serving at the U.S. Central Command (CENTCOM) as Director of Logistics (CCJ4) for 36 months (June 2007 to June 2010) has been both an honor and a pleasure. In a fast-paced environment with the combatant command at war, the challenges have been huge. My previous position as the U.S. Pacific Command Director of Logistics was a great billet that prepared me well for the leadership challenges that confronted me at CENTCOM. Many lessons learned there translated directly to CENTCOM, but CENTCOM presented many more unique challenges to overcome.

Nothing is easy about logistics in Afghanistan, Iraq, or any of the 20 countries that make up the CENTCOM area of responsibility. Insurgent violence, political instability, and complex ethnic and religious issues all combine to challenge even the best laid plans. Conducting an effective logistics operation in these environments would have been impossible if not for the cooperation, communication, and dedication of countless professionals across several large and complex logistics organizations.

As I look back over my 36 months as the CCJ4, I am overwhelmed and humbled by the sense of teamwork, dedication, and pride that I have consistently witnessed across the logistics enterprise. From the Office of the Secretary of Defense (OSD) right down to the tactical-level truck companies and supply squadrons, the Soldiers, Marines, Sailors, Airmen, and Department of Defense (DOD) civilians have all worked together to document, track, and move mountains of critical resources. Along with the dedicated personnel of the Joint Staff and our national partners of the U.S. Transportation Command (TRANSCOM), the Defense Logistics Agency (DLA), and our service components, all constitute what I like to call “Log Nation.”

In this article, I will attempt to share my personal insights into how I saw the joint operating areas of Iraq and Afghanistan as well as the Central and South Asian States

progress toward our commander’s intent through the tireless collaboration and cooperation of Log Nation.

The Situation Upon Arrival

Trusting in my longstanding belief that the most effective way to synchronize plans and operations across several large and complex organizations is to cultivate relationships and dialog, I set out to do just that. I established a senior logistics leader forum to pull together the key leaders from the warfighting sub-unified combatant commands, service components, and national partners. We met by secure video teleconference every month and face-to-face twice a year to develop a common sight picture, discuss upcoming challenges, and brainstorm solutions. This ad hoc venue created a network of working relationships that continues to gain momentum, and the invitee list continues to grow every year. Similarly, I formed a group of senior logistics leaders comprised of our coalition partners of the International Security Assistance Force (ISAF).

Each week, I published an update to the CENTCOM commander, which I subsequently shared across Log Nation. This weekly update both informed and stirred discussion, always resulting in productive cross-talk that kept us all synchronized. Establishing these key relationships early in my tenure, across all echelons of command, proved to be extraordinarily valuable in the demanding times to come.

Major General Dowd visits with Afghanistan National Police recruits.



When I arrived at CENTCOM in June 2007, our main effort was Operation Iraqi Freedom (OIF). The command had over 5 years of experience systematically rotating forces into and out of Iraq and sustaining those forces with a well-oiled logistics network hubbed out of Kuwait. The 2007 surge of forces in Iraq was underway, and by September of that year, the desired effects of the surge were being realized. General David H. Petraeus, then the commanding general of Multi-National Forces-Iraq (MNF-I), recommended to his chain of command in September 2007 that a gradual drawdown of U.S. forces from Iraq begin, with a goal of reaching pre-surge troop levels by July 2008. For the first time in years, there was a palpable optimism about achieving a democratic and stable Iraq and, subsequently, an opportunity to consider a reduced U.S. and Coalition Forces footprint.

Operation Enduring Freedom (OEF) in Afghanistan remained an economy-of-force effort, with the vast majority of forces and sustainment reaching Afghanistan through the land route traversing Pakistan. This was the general state of play in the command upon my arrival.

Responsible Drawdown of U.S. Forces

The security achievements of 2007 and early 2008 formed a foundation for the gradual establishment of

sustainable security in Iraq. U.S. partnerships have been fundamental to this progress since 2003. On 27 February 2009, President Obama confirmed that U.S. forces would be out of Iraq by the end of 2011. The two main implications of this for Log Nation were posturing for a responsible withdrawal of U.S. forces and supporting the training and equipping of Iraqi Security Forces (ISF).

To assist MNF-I in the monumental effort to draw down millions of pieces of equipment, the Army deployed teams into Kuwait and Iraq to oversee the processes and plans for redistributing and disposing of the excess. DLA Defense Reutilization and Marketing Service teams led the way with the responsible removal of hazardous material and scrap from Iraq. DLA removed more than 400 million pounds of scrap metal in 2009 and 2010. Army teams ensured that equipment in Iraq was not declared excess and available for redistribution until the commander on the ground determined that the equipment was no longer required to support the mission.

The priority for redistribution of excess equipment in Iraq is to push it to U.S. forces in Afghanistan. DOD sponsored a program to transfer equipment to Iraq. Collaboratively, with the services in the lead, we determined what equipment would be transferred to the ISF, what would be transferred to the Afghan National Security Forces (ANSF), and what would be shipped back to the continental United States (CONUS). Equipment was also made available to other government agencies through the National Association of State Agencies for Surplus Property for local government use, should a state or local government desire to pay the transportation cost for returning it to CONUS. As of December 2009, over 1.9 million pieces of standard Army equipment in Iraq, valued at \$12 billion, were scheduled to return to CONUS. This comprised approximately 63 percent of the equipment in Iraq today.

The Army established the Equipment Distribution Review Board cochaired by the Vice Chief of Staff of the Army and the commander of the Army Materiel Command. This board facilitated the distribution of equipment by streamlining existing Foreign Military Sales (FMS) program policies and processes. Much of the board's work to date has been to support filling Afghan National Army requirements. NATO [North Atlantic Treaty Organization] Training Mission-Afghanistan/Combined Security Transition Command-Afghanistan (NTM-A/CSTC-A) is an active participant, and the board recently accelerated delivery of equipment to meet NTM-A/CSTC-A training requirements for the Afghan National Army.

MNF-I immediately began examining what minimum essential capability the ISF would need in order to maintain an acceptable level of security against both internal and external threats. MNF-I determined it was important for the ISF to have at least

Top 10 Highlights

1. **Teamwork and development of Log Nation, from infancy to enduring partnerships.**
2. **Establishing the Northern Distribution Network.**
3. **Developing a second route for Pakistan ground lines of communication (Chaman route).**
4. **Partnering with Jordan to increase materiel volume and velocity through that strategic location.**
5. **Spearheading "AFG & CASA First" [Afghanistan and Central and South Asian States] initiatives.**
6. **Developing quarterly cost savings report for the CENTCOM commander.**
7. **Organizing biannual logistics general officer/flag officer (CENTCOM Senior Logistics Advisory Board) sessions in theater for all partners.**
8. **Developing a concept to expand our Joint Contracting Command to a theater-wide command.**
9. **Developing a multinational logistics section to synchronize foreign military sales and coalition logistics efforts.**
10. **Developing a logistics forum with NATO general officer/flag officer partners.**

a foundational capability to protect its land, maritime, and air sovereignty and determined that the ISF would not fully achieve the required capabilities before the end of 2011 without help.

In July 2009, MNF-I submitted a list of equipment requirements for the ISF to achieve the essential, sustainable capabilities needed to maintain security after U.S. forces depart Iraq at the end of December 2011. Of the approximately 3.3 million pieces of equipment in Iraq, Multi-National Security Transition Command-Iraq (MNSTC-I) identified approximately 53,000 pieces—the vast majority excess to service needs—required by the ISF to maintain internal stability and security.

To continue the momentum and further assist in the progress of the ISF, with the Joint Staff in the lead, we worked closely with the services to develop sourcing solutions for the equipment identified by MNSTC-I. We applied a mix of authorities to facilitate the transfer of equipment, property, and services to the both the ISF and the ANSF. Applicable authorities included the FMS program, Section 516 of the Foreign Assistance Act authorizing transfer of excess defense articles, and Section 1234 of the National Defense Authorization Act of 2010, known as the Levin Amendment. As of March 2008, the Iraqi government had purchased over \$2 billion worth of U.S. equipment and services through FMS. Since September 2008, delivery has improved as the FMS system strived to support urgent wartime requirements.

Much hard work remains to be done in assisting the ISF to assume full responsibility for security by December 2011, when the Security Agreement comes to an end and the drawdown of U.S. forces is scheduled to be completed. Achieving critical ISF capabilities as U.S. forces draw down is the best way to ensure that we remain on track to draw down American forces to roughly 50,000 and end our combat mission by August 2010.

Growth in Afghanistan

The decision to authorize an additional 21,500 U.S. forces in Afghanistan in early 2009, followed by the President's commitment of additional forces in December 2009, set the conditions to reverse Afghan Taliban gains. These additional forces are joining some 68,000 U.S. forces and 30,000 Coalition Forces already in Afghanistan, all of which have undertaken a fundamental shift in how they are being employed across the country.

As of late January 2010, we had already moved some 5,000 troops and expected that 18,000 of the President's 1 December 2009 commitment would be in country by late spring. The remainder of the 30,000 will arrive as rapidly as possible over the summer and early fall, making a major contribution to reversing Taliban momentum in 2010.

As complex as the new strategy in Afghanistan was, the logistics of getting the troops and equipment in place was an equally complex undertaking. Our main concern going in was ensuring that we set the theater with the early deployment of critical enablers. These enablers included DLA's push of more than 4,000 containers of construction material, which helped enable the construction of critical forward operating bases (FOBs); analysis of the feasibility of moving forces according to the President's timeline; and successfully expediting the fielding of the mine-resistant ambush-protected (MRAP) family of vehicles.

In early 2009, we began to refine and fulfill logistics requirement to support deployment of the initial 21,500 personnel into Regional Commands South and West. Most critical to setting the theater for success was the early deployment of engineering teams and equipment. Through significant coordination and effort with the Army Corps of Engineers, the services, and others, we expedited the delivery of thousands of pieces of critical engineering equipment. By early August 2009, eight base camps were completed, enabling a combat aviation brigade, Stryker brigade, and Marine expeditionary battalion to begin combat operations.

Military construction projects scheduled for completion over the next 12 months will deliver 4 new runways, ramp space for 8 C-17 transports, and parking for 50 helicopters and 24 close air support and 26 intelligence surveillance and reconnaissance aircraft. This represents roughly one-third of the airfield paving projects currently funded in the Afghanistan theater of operations. Additional minor construction plans called for the construction of over 12 new FOBs and expansion of 18 existing FOBs.

Afghanistan is a landlocked country with very little infrastructure. The task of executing the deployment and sustainment of the additional forces was viewed by many as perhaps the greatest limiting factor to the plan. My planning staff called together a major planning effort to identify and recommend possible sourcing solutions to satisfy force requirements. In coordinating with TRANSCOM and the services, we conducted a force flow conference to determine the feasibility of moving the required forces into Afghanistan in accordance with the President's timeline. The analysis showed that the movement plan was feasible but carried high risks. In other words, we could accomplish the mission as long as additional emergent requirements were kept to a minimum. We knew the requirements would grow, so we had to think outside the box to develop creative solutions.

Our business rules call for all sensitive or classified cargo to be flown into Afghanistan on military or commercially contracted aircraft. All other cargo is shipped via surface routes. Our primary surface route uses the seaport of Karachi, Pakistan, where we have



Major General Dowd signs a transit support agreement with Jordan for support of the Iraq drawdown.

no U.S. force presence. Equipment is disembarked and then transported by commercially contracted vehicles, known as “jingle trucks,” along two primary routes. One route crosses into Afghanistan through the Chaman gate, while the other crosses into Afghanistan along the Khyber Pass through the Torkham gate. Both of these routes take our cargo straight through the heart of insurgent territory. Despite the Government of Pakistan’s tremendous support and partnership, we recognized the need to expand our options for surface movement into Afghanistan.

Northern Distribution Network

We began in earnest to establish a northern distribution route in early 2009. We devised a strategic engagement strategy that leveraged leadership from CENTCOM, TRANSCOM, OSD, and the Department of State. Through senior leader visits and negotiations, the Northern Distribution Network (NDN) became a reality.

We now have a series of robust routes that traverse Europe, the Caucasus, and the Central and South Asian States into Afghanistan. We have also established a surface route to transport military equipment from Iraq through Turkey that merges with the NDN for onward movement to Afghanistan. As June 2010, the Military Surface Deployment and Distribution Command has booked over 50 percent of all sustainment heading to Afghanistan on the NDN and has delivered over 11,000 20-foot containers of cargo to Afghanistan through these new northern routes.

At present, the transit agreements with most of the countries through which the NDN runs limit the type of cargo eligible for the NDN to nonlethal cargo only. As a result, the land route through Pakistan is still used for nearly all unit cargo. We hope to expand the categories of cargo permitted on the NDN and to retain and expand logistics hubs in Central Asia.

The success of the NDN is a testament to the cooperation and commitment of several organizations. We

all stayed synchronized through biweekly flag officer-level and O6-level secure video teleconferences hosted by TRANSCOM and CENTCOM. Expansion of the NDN through Europe, the Central and South Asian States, and Turkey lessens our reliance on the surface route through Pakistan and provides the logistics flexibility needed to deploy and sustain the increased force in Afghanistan. Today, the NDN has proven to be far more than a logistics initiative. It is, in fact, a diplomatic engagement tool.

Central and South Asian States

Our relationship with the Central and South Asian States continues to improve as a result of the NDN. We are actively working to expand our partnerships with these nations by locally procuring supplies for OEF forces from NDN-supporting countries. We sought special legislation, Section 831 of the 2010 National Defense Authorization Act, to provide enhanced authority to acquire products and services produced in the Central and South Asian States that support military and stability operations in Afghanistan.

This legislation directly supports the economic development of the Central and South Asian region. With DLA serving as CENTCOM’s lead for this initiative, the economic impact since July 2008 has exceeded \$400 million. This level of economic activity represents a substantive commitment by the U.S. Government to the countries of this region.

MRAP Vehicles Save Lives

I have seen MRAP vehicles in Iraq and Afghanistan, battle damaged beyond recognition, from which our troopers have safely walked away. MRAP vehicles save lives. They offer a proven capability to reduce combat deaths and casualties associated with roadside bombs and other explosives. The Soldiers, Marines, Sailors, and Airmen who use these vehicles have great confidence in the MRAP’s abilities to defeat enemy attacks.

The MRAP family of vehicles is the best vehicle protection we have to date, with their V-shaped armored hulls and raised chassis. As of 1 March 2010, 25,561 vehicles in the MRAP family were under contract out of an acquisition objective of 26,882. Of those, 17,457 were MRAPs and 8,104 were the lighter, more maneuverable MRAP all-terrain vehicle (M-ATV). As of 1 March 2010, we had fielded just over 37 percent (approximately 5,338) of the approximately 14,331 vehicles required in Afghanistan.

To expedite delivery of this lifesaving weapon system, we have worked with TRANSCOM, OSD, and the Department of State to establish a multimodal shipping concept of operations. Vehicles are transported by ship to a seaport of debarkation in the CENTCOM region and then cross-loaded onto aircraft at a nearby aerial port of embarkation for final delivery by air

Bottom Line Up Front: My Top 5

- 1. Top priority: Understand senior leader intent and translate that into feasible courses of action.**
- 2. There are no “silver bullets.” Think big and allow solution creativity and operational latitude.**
- 3. Target an objective. Build broad joint consensus to achieve it. Act decisively in pursuit.**
- 4. Build a team. Leverage leaders and units to maximize unique experience and capabilities.**
- 5. Pass praise freely. Quickly recognize and reward contributions, especially from young leaders.**

into Afghanistan. The creative thinking and problem-solving by my very talented and persistent staff have ensured that cargo, including MRAP vehicles, is flowing into Afghanistan to save lives and meet the President's timeline.

Leveraging NATO and ISAF Contracts

In contrast to operations in Iraq, operations in Afghanistan are commanded by NATO and ISAF. We determined early on the importance of leveraging support with our NATO partners. For example, through the collaboration achieved during our NATO senior logistics leader sessions, we were able to commit to sharing contracts for fuel and real life support at FOBs where we had a multinational presence. Since the capacity for support in Afghanistan was limited, we shared where it made sense to do so. This helped control the cost of contracted support and also lessened the national burden on each participant by limiting the number of FOBs requiring support. The collaboration with NATO and ISAF increased dramatically throughout my tour as the CCJ4.

Contractors on the Battlefield

The deployed contractor force is a key component to the success of the warfighter mission and an indispensable source for essential technical support, maintenance, transportation, security, base support, and construction capability. Accounting for total numbers and locations of contractors allows the commanders the visibility to better forecast logistics and force protection requirements.

The Joint Contracting Command Iraq and Afghanistan (JCC-I/A) serves as the centralized management and enforcement organization for contracts in Iraq and Afghanistan, but it awards only 25 to 30 percent of the contracts in the theater. It does, however, vet each contract in the theater to ensure that all applicable clauses are included in the contract. CENTCOM will soon expand the JCC-I/A into a Joint Theater Support

Contracting Command to synchronize contracting efforts in Pakistan and Kuwait as well as Iraq and Afghanistan.

A thorough oversight program ensures contract compliance to meet warfighter requirements. This becomes especially important when overseeing private security contractors on the battlefield. Private security contractors provide unique skills and can quickly meet the increased needs for security when military forces are stretched thin. Several high-profile incidents involving serious misconduct by private security contractors have led Congress and DOD to mandate management frameworks and strict legal accountability specifically for these contractors.

The Government Accountability Office, the DOD Inspector General, and other inspecting organizations have increased their assessments of contracting operations from 6 in 2007 to 54 in 2009. With the help of these organizations, Log Nation has made significant progress in the area of contractor oversight. It must continue that trend.

As the Director of Logistics at CENTCOM, I have had the pleasure of working with a remarkably talented group of officers, noncommissioned officers, Government civilians, and contractors. Their efforts and sacrifices have sustained us through my 36 months in the job, but more broadly, over almost 9 years of continuous war. Thanks to them, we are positioned to finish well in Iraq and can begin to turn a corner in Afghanistan. Our deputy commander, Marine Corps Lieutenant General John R. Allen, often says that the historians will one day write books about the NDN. I am convinced they will.

At the end of the day, it is the job of the logistician to ensure that the warfighting commanders never have to look back for support. As I depart CENTCOM to take command of the 1st Theater Sustainment Command, I am pleased to be entrusted with new challenges that will allow me to continue to play a part in this unique time in the history of DOD logistics. Most of all, I am truly honored by the opportunity to play a significant role in Log Nation's continued future in this complex region.

MAJOR GENERAL KENNETH S. DOWD WAS THE DIRECTOR OF LOGISTICS, J-4, U.S. CENTRAL COMMAND, WHEN HE WROTE THIS ARTICLE. HE IS EXCEPTIONALLY PROUD OF HIS PART IN THE “LOG NATION” TEAM AND ACROSS THE REST OF THE LOGISTICS ENTERPRISE. HE IS NOW THE COMMANDER OF THE 1ST SUSTAINMENT COMMAND (THEATER) AT FORT BRAGG, NORTH CAROLINA, WHERE HE LOOKS FORWARD TO CONTINUING HIS SERVICE ALONGSIDE THE DEDICATED PERSONNEL OF LOG NATION.

GENERAL DOWD THANKS COLONEL LINDA MARSH, USAF, FOR HER ASSISTANCE IN THE WRITING OF THIS ARTICLE. COLONEL MARSH IS CHIEF OF STAFF OF STRATEGIC COMMUNICATIONS FOR THE U.S. CENTRAL COMMAND J-4 DIRECTORATE. SHE PREVIOUSLY SERVED AT CENTCOM AS CHIEF OF THE AIR BRANCH, DEPUTY CHIEF OF THE MOBILITY DIVISION, AND ASSISTANT DIRECTOR OF THE LOGISTICS DIRECTORATE. SHE HOLDS AN M.S. DEGREE IN STRATEGIC STUDIES FROM THE AIR UNIVERSITY.

The Financial Management Campaign Plan: Raising the Bar to Achieve Sustainment Excellence

BY LIEUTENANT GENERAL EDGAR E. STANTON III

As the Army continues the transformation of our operational forces, 9 years of prolonged conflict and a continuous demand for trained and ready forces reveal a corresponding need to transform our generating forces to effectively support the Army Force Generation (ARFORGEN) cycle and meet the requirements of a 21st century Army.

The Army's Financial Management (FM) community is fully engaged in adopting Army-wide end-to-end processes and developing a culture that encompasses enterprise management, cost and performance, and leaders capable of making resource-informed decisions. To methodically reach these objectives, the FM community recently developed the Financial Management Campaign Plan (FMCP). The FMCP represents the community's realization that our current processes for supporting the ARFORGEN cycle require revision to meet the sustainment demands of the Operational Force engaged in full-spectrum operations.

The FMCP provides a methodology for improving five FM focus areas: warrior training and education, force design, FM systems requirements, doctrine, and communication. Enhancing each of these areas improves FM capabilities embedded within theater and expeditionary sustainment commands and sustainment brigades by providing highly agile and adaptive FM warriors who are trained and ready to execute full-spectrum operations.

The Catalyst for Change

Two significant events jump-started the initial development of the FMCP: a detailed white paper and a well-planned leaders training summit. In October 2009, Colonel Troy A. Clay, who is now the commander of the Army Finance Command, wrote "Strategy to Develop and Sustain Financial Management Capability in Support of Our Expeditionary Army." This white paper surveyed the FM landscape, defined the FM community's challenges, and proposed some possible solutions to those challenges.

To explore these possible solutions, the commandant of the Army Financial Management School, Colonel Milton L. Sawyers, hosted an FM training summit in mid-December 2009 that

brought together more than 60 FM leaders from key organizations throughout the FM community. During the summit, the participants developed and refined the five focus areas in accordance with the white paper, the Army Capstone Concept, and emerging FM doctrine. These five refined focus areas served as the underpinnings for developing the FMCP.

The Financial Management Campaign Plan

After significant contributions from across the entire FM community, the Army Financial Management School released the completed FMCP in January of this year. The "Mission Statement" and "End State" serve as the anchor points for all lines of operation and supporting tasks. (See chart below.)

The FMCP employs logical lines of operations (LOOs) to link multiple decisive points and tasks to achieve the desired end state. The LOOs are being executed through 14 supporting tasks, which are assigned to FM responsible organizations (ROs) that developed and are now executing their implementation plans. Each

Mission Statement

Build, train, and sustain a campaign-quality, expeditionary FM force able to operate effectively with joint, interagency, intergovernmental, and multinational partners to provide full spectrum FM and sustainment to warfighting commanders engaged in unified action in support of the National Security and National Defense Strategies.

End State

A ready and balanced FM force capable of executing full-spectrum operations (FSO) through superbly trained, educated, adaptive, and agile military and civilian FM warriors enabled with state-of-the-art FM and command and control systems and adept at the coordinated application of fiscal and economic power in support of national and military objectives.

5 LOOs		Fourteen Supporting Tasks
LOO 1: FM Doctrine and TTP Development	1.1:	Maintain Field Manual 1–06, Financial Management Operations, to respond to advances in FM operations, systems, and structure.
	1.2:	Develop and publish relevant FM Army tactics, techniques, and procedures (ATTP), training circulars (TCs), and other training publications.
LOO 2: FM Force Structure and Manning Levels	2.1:	Reevaluate the current FM structure (SRC 14/Non-SRC 14) and ability to support ARFORGEN requirements.
	2.2:	Conduct “troop to task” analysis and a management study for USAFINCOM to determine the right structure and manpower requirements.
	2.3:	Seamlessly transition the MILPAY mission to the HR community.
	2.4:	Determine how to recapitalize DFAS functions that will allow FM units to sustain battlefield FM competencies while in garrison.
LOO 3: FM Unit, Warrior, Leader, and Professional Development	3.1:	Develop comprehensive list of multifunctional skills required for branch 36 and CP 11 personnel to conduct full spectrum FM operations.
	3.2:	Develop a centralized “road to war” training strategy for all FM enablers across all components.
	3.3:	Revise and update career models for all branch 36 and CP 11 personnel.
	3.4:	Develop and establish a centralized joint FM training platform to be used for deployment/sustainment training.
LOO 4: FM and C2 Systems and Platforms, FM Unit MTOE	4.1:	Establish new FM systems requirements (3 to 5 years).
	4.1.a:	Establish FM existing systems requirements (bridging strategy).
	4.1.b:	Develop FM systems training strategy for all FM enablers across all components.
LOO 5: FMCP Communication Plan	5.1:	Develop an FMCP communication plan that leverages the SSI communication strategy in order to broadcast the FMCP Army-wide.

LEGEND

ARFORGEN	= Army Force Generation
CP	= Civilian career program
C2	= Command and control
DFAS	= Defense Finance and Accounting Service
FM	= Financial Management
FMCP	= Financial Management Campaign Plan
HR	= Human Resources
LOO	= Line of operations
MILPAY	= Military pay
MTOE	= Modification table of organization and equipment
SRC	= Standard requirements code
SSI	= Soldier Support Institute
TTP	= Tactics, techniques, and procedures
USAFINCOM	= U.S. Army Finance Command

implementation plan consists of achievable, results-driven tasks. As ROs progress on their assigned supporting tasks, they are reaching out to the numerous stakeholders, such as the Defense Finance and Accounting Service, U.S. Army Central Command, the Army Forces Command, and Headquarters, Department of the Army, to ensure that all concerns are addressed fully and communicated to the FM leadership. The chart above shows the supporting tasks for each LOO.

Achieving the goals of the FMCP is a monumental undertaking that requires collaborative planning and a responsive execution architecture within the FM community. The Army Financial Management School, through

the Army Soldier Support Institute and the Sustainment Center of Excellence, continues to serve as the operational element for monitoring and reporting execution of the FMCP to senior FM leaders.

Regardless of which organizations fulfill RO responsibilities, the success of the campaign plan relies on the coordinated efforts of the entire sustainment community. With the FMCP now in full swing, the Army FM community is better postured to

respond to the continuous cycle of adaptive innovation, experimentation, and experience within our Army.

The FMCP is a living campaign plan with the potential to expand and contract as supporting tasks are completed and new supporting tasks are identified. The plan demonstrates our commitment to meet the needs of the 21st century Army engaged in full-spectrum operations. The FMCP requires continuous assessment of the FM landscape. The challenge is to anticipate and identify the next paradigm shift, whether that shift emerges as a result of a new system, a variation in structure, or any other significant change in the operational environment.

Regardless of the challenges, our success depends on our partnership with the sustainment community. Working together, we will build, train, and sustain a campaign quality force able to provide full-spectrum financial management and sustainment to warfighting commanders.

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The New FM 1–0, Human Resources Support

BY THOMAS K. WALLACE, JR.

As the Army proceeds with its transformation to a modular force built for expeditionary and joint operations, our various doctrinal building blocks must be reviewed and, quite frequently, revised to match the new operational reality. As part of this process, in April 2010 the Army released an updated Field Manual (FM) 1–0, Human Resources Support. Although the fundamentals of the human resources (HR) discipline remain the same, significant changes in organizations and definitions have been incorporated into the new FM to reflect today's, and our anticipated future, environment. The revised FM also consolidates FM Interim (FMI) 1–0.01, S–1 Operations, and FMI 1–0.02, Theater-Level Human Resources Support, to create a single-source doctrinal publication for HR support.

HR support endures as the backbone of the Army. If the Soldier is the centerpiece of the force and its capabilities, then support to the Soldier constitutes the most basic, yet most essential, of Army activities. With this in mind, the overriding objective of HR support is to execute personnel decisions that maximize the operational effectiveness of the total force and sustain optimal readiness. This requires that HR support be integrated across the strategic, operational, and tactical levels; that it take into account the missions of supported *and* supporting units; and that it address the needs of all customers.

FM 1–0 outlines specific functions and tasks that the HR professional must be competent in and knowledgeable about to ensure reliable, responsive, and flexible support to commanders, Soldiers, Department of Defense (DOD) civilians, contractors authorized to accompany the force, and families. The FM contains six chapters and four appendices, which this article summarizes.

Major Changes in HR Doctrine

Chapter 1 highlights the major changes made in HR doctrine and provides an overview of HR support at the strategic, operational, and tactical levels. It also identifies HR objectives, enduring principles, core competencies, key functions, and the command and control relationships with the sustainment community. Significant changes to HR doctrine include the following:

Separating the task of personnel accountability and strength reporting (PASR). This separation was necessary because PASR is actually two distinct tasks that are managed or executed by different elements above brigade level. Personnel accountability is an HR unit function executed by S–1s and HR units. Strength reporting is a command function and is executed by S–1s and G–1s.

Reducing the HR core competencies from 10 to 4 tasks. All previous HR tasks are now aligned under one of the following four core competencies: man the force, provide HR services, coordinate personnel support, and conduct HR planning and operations. The previous core competencies of casualty reporting, personnel information management, personnel readiness management, postal operations, band operations, and PASR have been changed to functions and aligned under one of the new core competencies. (See the chart at right.)

Adding HR enduring principles. The six HR enduring principles are integration, anticipation, responsiveness, synchronization, timeliness, and accuracy. Each of these principles must be weighted and applied during the planning, execution, and assessment of HR support for current and future operations. While the principles are independent, they are also interrelated to build and sustain combat power. The principles of integration, anticipation, and responsiveness are also sustainment principles outlined in FM 4–0, Sustainment.

Eliminating the term R5 (replacement, reception, return to duty, rest and recuperation, and redeployment). R5 has been replaced with personnel accountability (PA). R5 was eliminated because it caused confusion in task execution and PA roles and responsibilities.

Redesigning the HR company. The company has been reorganized to consolidate the PA plans and operations team and the postal plans and operations

Postal operations is one of the functions of the HR core competency of provide HR services. (Photo by PFC Daniel M. Rangel)



team at the company level under the operations section. This consolidation streamlines the HR company and makes the operations section more efficient in performing full-spectrum HR operations.

Chapter 1 also describes how effective and efficient HR support relies on multifunctional HR leaders who must think strategically, work collaboratively, and be capable of producing and executing agile and clear HR policies. HR professionals must also use effective practices to pursue outcome-oriented actions and have the competency-based skills and knowledge required and expected of them.

Chapter 1 emphasizes the need for HR professionals to understand the importance of not only their efforts and unit missions but also the missions of supporting and supported units. Supported units include the division and corps G-1s/adjutants general, battalion and brigade S-1s, and HR operations branch within the sustainment brigade or expeditionary sustainment command. Supporting units are HR-specific units and include the HR sustainment center, military mail terminal, theater gateway personnel accountability teams, and HR companies with supporting postal and multifunctional HR platoons.

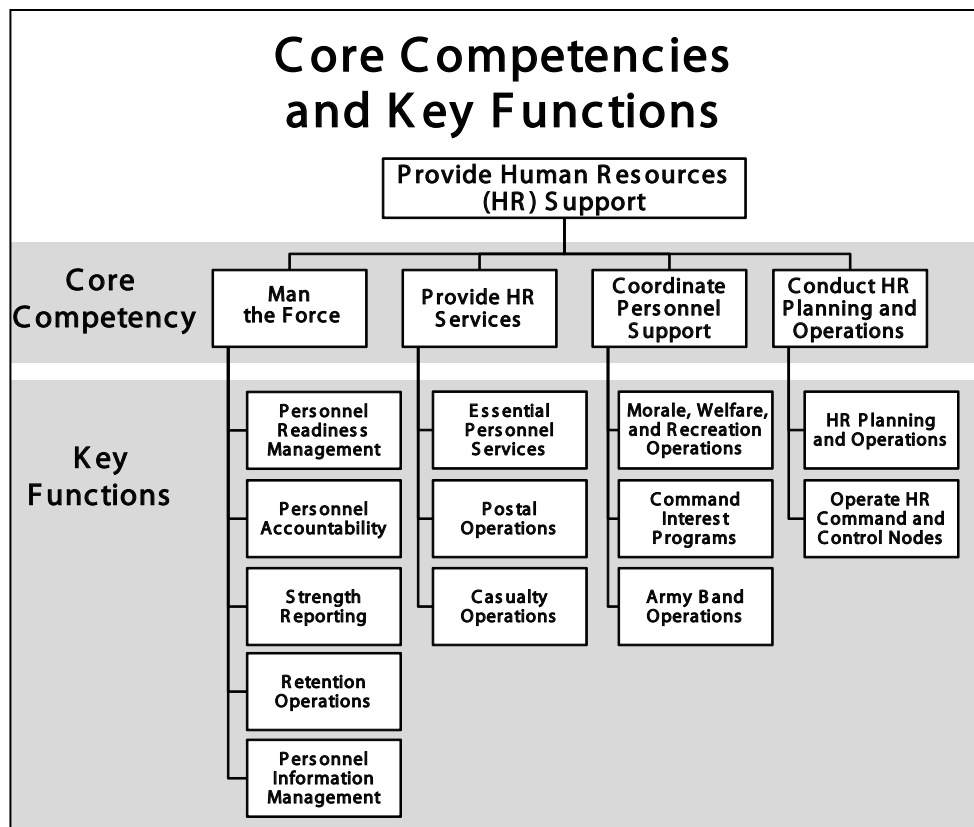
Core Competencies and Functions

HR support consists of the four core competencies, each of which includes subordinate key functions that directly support the competency. The core competencies and their supporting key functions are as follows:

Man the force. This competency includes all functions and tasks that affect the personnel aspect of building the combat power of an organization. Key functions are personnel readiness management, personnel accountability, strength reporting, retention operations, and personnel information management.

Provide HR services. HR services covers functions conducted by HR professionals that specifically affect Soldiers and organizations. These functions include essential personnel services, postal operations, and casualty operations.

Coordinate personnel support. Personnel support encompasses those functions and activities that contribute to unit readiness by promoting fitness, building morale and cohesion, enhancing quality of life, and providing recreational, social, and other support services to



FM 1-0 reduces the number of HR core competencies from 10 to these 4. Each competency is executed through several key functions.

Soldiers, DOD civilians, and other personnel who deploy with the force. Personnel support encompasses the functions of morale, welfare, and recreation (MWR) operations, command interest programs, and band operations.

Conduct HR planning and operations. HR planning and operations are the means by which HR leaders envision a desired HR end state that supports the operational commander's mission requirements. Planning communicates to subordinate HR providers and unit leaders the commander's intent, expected requirements, and desired outcomes in the form of an operation plan or order. Planning also provides a process for tracking current and near-term (future) execution of the planned HR support to ensure effective support to the operational commander.

HR Organization and Employment

Chapter 2 discusses the mission, organization, and employment of HR organizations and HR staff elements located at the theater, corps, division, brigade, and battalion levels. FM 1-0 identifies and describes the roles and responsibilities of each HR organization and HR staff element. The FM includes changes resulting from the recent force design update, which consolidated the HR and casualty platoon into a multifunctional HR platoon. Detailed discussion is included on the platoon's capability to form personnel accountability teams and casualty liaison teams.

Major Changes in FM 1–0, Human Resources Support

- Reduces FM 1–0 from over 300 pages to 165.
- Reduces core competencies from 10 to 4.
- Establishes human resources (HR) enduring principles.
- Separates personnel accountability and strength reporting (PASR) into two separate and distinct functions.
- Eliminates the term R5 (reception, replacement, return to duty, rest and recuperation, and redeployment) and replaces it with personnel accountability.
- Incorporates HR force design updates for a multifunctional HR platoon.
- Incorporates full-spectrum operations.

FM 1–0 makes significant changes in human resources (HR) doctrine to create a single-source doctrinal publication for HR support.

The chapter also provides recommended performance indicators for the HR operations branch. These indicators will enable the branch to identify, track, and synchronize HR support into the overall sustainment plan.

Man the Force

In chapter 3, the core competency of “man the force” is described as any action or function that impacts the strength or readiness of an organization. Manning combines anticipation, movement, and skillful positioning of personnel so that the commander has the personnel with the right skills, capabilities, and special needs required to accomplish the mission and to meet changing operational needs.

The key function of man the force is personnel readiness management as it directly relates to the other key functions of personnel accountability, strength reporting, and personnel information management. The FM summarizes the roles and responsibilities of each man-the-force function by command level, from theater to battalion, and by HR units.

Provide HR Services

Chapter 4 discusses the core competency of provide HR services, which includes those functions that directly affect a Soldier’s status, assignment, qualifications, financial status, career progression, and quality of life and that allow Army leaders to effectively manage the force. Included are the key functions of essential personnel services, postal operations, and casualty operations.

Essential personnel services include promotions, awards and decorations, leaves and passes, evaluation reports, citizenship and naturalization, and other related

functions that are initiated by Soldiers, unit commanders, unit leaders, G–1s and S–1s, or from the top of the system. Casualty operations and postal operations are discussed in detail and include roles and responsibilities by each level of command and by HR units.

Coordinate Personnel Support

The core competency of coordinate personnel support is covered in chapter 5. Personnel support activities include those functions and activities that improve individual fitness, increase morale and cohesion, foster a better quality of life, and furnish recreational, social, and other support services for Soldiers, DOD civilians, and other deploying personnel. All of these activities are conducted with the goal of increasing unit readiness. The roles and responsibilities of each command level and HR units for MWR, command interest programs, and band operations are identified.

HR Planning and Operations

Chapter 6 discusses the core competency of HR planning and operations. It emphasizes to HR providers the need to have a complete understanding of the full capabilities of HR organizations and discusses how to plan and employ HR doctrine in current and future operations. Each step in the military decision making process (MDMP) is clearly identified, along with specific HR actions that must be considered when developing an operation order or plan. The planning process also identifies the need for the composite risk management process to be aligned with each step of the MDMP.

FM 1–0 contains five appendices that provide planning and management tools for HR operations. These include HR rear detachment operations, HR theater-opening and redeployment operations, casualty estimation, civilian support, and a division of HR labor task matrix. Each appendix identifies roles and responsibilities for HR professionals in HR-specific units and supported organizations.

FM 1–0 promotes a common understanding of HR support fundamentals. The manual does not dictate procedures for any particular operational scenario, nor does it provide specific system procedures for HR enablers. It provides the doctrinal base for developing operation plans and standing operating procedures. Leaders and HR operators at all levels must apply these fundamentals using Army planning and decisionmaking processes. The FM is an authoritative guide that requires judgment in application.

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Moving Toward a More Sustainable Army Food Program

BY DAVID J. SHERRIFF

Sustainability is a concept that is having a major effect on the commercial food service industry. Manufacturers, colleges and universities, food service distribution and management companies, and Government agencies are all talking about “sustainability” and what they are doing to promote it within their operations and business practices. The Army needs to answer several questions regarding sustainability: As part of the overall food service industry, where does sustainability fit into the Army Food Program? What exactly does sustainability mean? Should we be using sustainable practices? How do we know if we are being sustainable? If we are not, how can we start? Why should we even care?

Defining Sustainable

Before answering these questions, we should define the word “sustainable.” *Merriam-Webster’s Dictionary* defines sustainable as a way of “using a resource so that the resource is not depleted or permanently damaged.” Sustainability is typically used today in

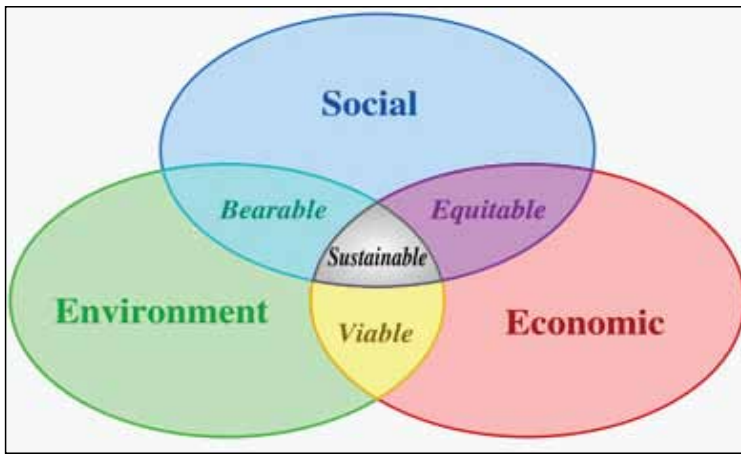
an environmental or ecological sense. In this context, Wikipedia defines it as the “ability of an ecosystem to maintain ecological processes, functions, biodiversity, and productivity into the future.”

This certainly is not a workable definition for Army purposes. The problem is that sustainability is a complex term that can be applied to any ecosystem on Earth (such as oceans, forests, or wetlands) and can be included in human endeavors such as agriculture, architecture, and energy production. Furthermore, no definition is universally accepted and terms like sustainable, sustainability, sustainable development, and sustainable practices are often used interchangeably. Sustainability has been regarded as both an important but unfocused concept, like “liberty” or “justice,” and a feel-good buzzword with little meaning or substance. How can such a nebulous and vague term have such an impact on society?

For this discussion of sustainability and the Army Food Program, I will use the most widely accepted definition of sustainability and sustainable development,

The Army will purchase or lease neighborhood electric vehicles (NEVs), like these being delivered to Fort Sam Houston, Texas, to reduce the amount of fossil fuel being used by installation vehicles.





Three primary overlapping factors—social, environment, and economic—identify sustainable operations. Any business or operational practice that is socially equitable, environmentally bearable, and economically viable is a sustainable practice and should be incorporated to the fullest extent possible.

provided by the World Commission on Environment and Development: “to meet the needs of the present without compromising the ability of future generations to meet their own needs.”

Living Sustainably

To live sustainably, we must use the Earth’s resources at a replenishable rate. However, scientists tell us that, as a whole, human beings are not living sustainably. Instead, we are using resources faster than they can be replenished. Sustainable practices, developments, and concepts are those actions taken and decisions made to attempt to reverse this trend.

More important than the technical definition of sustainability is an understanding of how sustainability affects the Army Food Program and grasping the how and why of operating in more sustainable ways. Let’s start with the why.

You do not have to be a certified tree hugger or carbon-credit speculator to see the value of sustainability. In fact, many aspects of sustainability merely involve using better business practices and have multiple benefits. I see three major categories of reasons why the Army Food Program should attempt to operate in more sustainable ways: environmental, social, and financial.

Environmental reasons. Regardless of whether you are a skeptic or you believe that manmade global warming and climate change, it should be obvious that, from an environmental standpoint, using less energy is preferable to using more. Changing ambient temperature requires the use of energy—energy that must be transferred from another source or form, often pollution-creating power plants. Business practices that lead to increased vehicle traffic use more gasoline and create more exhaust pollution. Trash must be transferred and discarded, requiring

additional vehicle traffic and landfill space. Certain cleaning and operating supplies can be harmful to the environment. Sustainable business practices that reduce energy usage and trash generation and use less-damaging cleaning and operating supplies will reduce negative effects on the environment.

Social reasons. As society places a greater emphasis on sustainability, the Army will be expected to follow suit or perhaps even take a leading role. Sustainable operating practices will help to keep the Army in a positive light. Since the Army tries to loosely model its garrison dining facility operations after college and university food service operations, it follows that as they place greater emphasis on sustainability, the Army would do the same. Since the Army and colleges and universities target the same demographic (18- to 24-year-olds away from home for the first time), sustainable practices will be increasingly important to both.

Financial reasons. Many of the environmental benefits of sustainable business practices also make financial sense. For example, reducing food waste is not only better for the environment but also reduces food costs, which helps a dining facility maintain its account status. Reducing energy and water usage represents a cost avoidance to the installation. Reusing items for some other purpose eliminates the need for purchasing additional items.

The Army’s Move Toward Sustainability

The Army is already embracing sustainability. Several examples of how the Army is moving toward more sustainable operations include—

- ❑ The Defense Logistics Agency (DLA) Strategic Plan for fiscal years (FYs) 2007 to 2013 includes a goal to increase DLA’s offering of “green” products by 25 percent through the end of FY 2011. As a major customer of DLA, the Army will begin to purchase more green products simply as a result of changes in the supply system.
- ❑ In FY 2007, 78 percent of Army military construction projects were designed to meet the U.S. Green Building Council’s new construction certification standards.
- ❑ Almost every Army installation (if not all) has an active recycling program. This is an important part of sustainability that has been around so long that it is often overlooked.
- ❑ On 12 January 2009, the Army received its first 6 neighborhood electrical vehicles (NEVs) and plans to purchase 4,000 more by FY 2012. These vehicles are street legal in nearly all 50 states on roads with speed limits of 35 miles per hour or less and can travel about 30 miles on one charge. The NEVs will replace part of the Army’s fleet of nearly 68,000 nontactical vehicles and will reduce the Army’s fuel consumption by almost 2 million gallons per year.

- ❑ The Joint Culinary Center of Excellence is working with the Defense Supply Center Philadelphia and the other services through the Joint Subsistence Policy Board to determine the feasibility of promoting the use of certified humane cage-free eggs through the Subsistence Prime Vendor program.
- ❑ The Army has its own website dedicated to sustainability and sustainable operations: www.sustainability.army.mil/.

Food Service Industry Practices

Here are several examples of how the food service industry is embracing sustainability. Not all of these would be feasible in Army dining facilities, and inclusion of these ideas in this article does not mean an endorsement of them. The goal is to identify potential sustainable practices and products for consideration and possible adoption.

Divert food waste from a landfill to more environmentally friendly options, such as donation or composting. An estimated 4 to 10 percent of all food purchased ends up as pre-consumer waste. The focus should therefore be first on reduction of waste and next on diversion since reducing the amount of food waste generated is cleaner and more cost effective than properly disposing of it. One way to do this is through the use of food waste audits, which involve identifying and analyzing food waste, both pre- and post-consumer, to determine the volume and types of food being wasted. This will hopefully lead to ways to reduce food waste both in the front and back of the house.

Compost food waste to reduce waste, cut waste-handling fees, and potentially help local growers. Many composting systems recommend only composting vegetable trimmings and avoiding meat and dairy items and also table scraps to keep out unwanted food and nonfood items such as straws. Other composting systems can take everything, to include table scraps, bones, and compostable ware all at once.

Use compostable take-out containers and cups. These are becoming more popular. Compostable gloves are also available for use in the kitchen.

Use refillable water containers. These are slowly replacing bottled water, which has been a prime target for environmentalists. At least one company offers a compostable plastic water bottle that will completely break down in as little as 60 days, and another is marketing its plastic water bottles as using 50 percent less plastic than the competition. (Bottled water is not authorized for purchase using Military Personnel, Army appropriated subsistence funds per Army Regulation 30-22, The Army Food Program.)

Switch to eco-clamshells, made out of sturdy melamine and plastic, as washable, microwavable, and reusable alternatives to Styrofoam take-out containers.

Adopt trayless dining, which is a growing trend in college and university food service settings. Although customer dissatisfaction is a key challenge, studies have shown that going trayless can reduce food waste by as much as 25 percent since diners no longer have trays on which to conveniently stack excess food. Going trayless reduces the amount of water and chemicals used in the dining facility by eliminating the need to wash trays.

Buy local. Another growing trend, this concept not only reduces the amount of fuel used to haul produce across the country but also provides a financial benefit to the local community.

Reduce waste on the service line by using smaller serving vessels at salad bars and for other self-serve options and refilling them more frequently or by starting with larger vessels at the beginning of the meal period and refilling progressively smaller containers as the crowd thins.

Use an employee reward program to recognize those who identify sources of food waste reduction in the dining facility or who do not take shortcuts when using established waste reduction methods.

Avoid preheating all food service equipment just because it is time to start cooking. Instead, carefully determine which pieces of equipment should be turned on (and off) and at what time so that they do not run longer than necessary.

Reduce energy consumption by ensuring that proper maintenance is performed on food service equipment and installing low-wattage lighting and low-flow plumbing fixtures.

Install bulk cooking oil tanks to reduce food costs and packaging.

The following website contains more ideas and information on how to run more sustainable food service operations: www.sustainablefoodservice.com/.

Some Army food service operations have already begun to adopt sustainable practices. I hope that you will consider adopting some sustainable practices of your own and that you will share your experiences with us at the Joint Culinary Center of Excellence. Contact David Sherriff by telephone at (804) 734-4862 (DSN 687) or by email at david.sherriff@us.army.mil for more information on sustainable food service practices or to share your ideas and experiences.

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Evolution of Petroleum Support in the U.S. Central Command Area of Responsibility

BY COLONEL JEFFREY B. CARRA AND CHIEF WARRANT OFFICER 4 DAVID RAY, USMC (RET.)

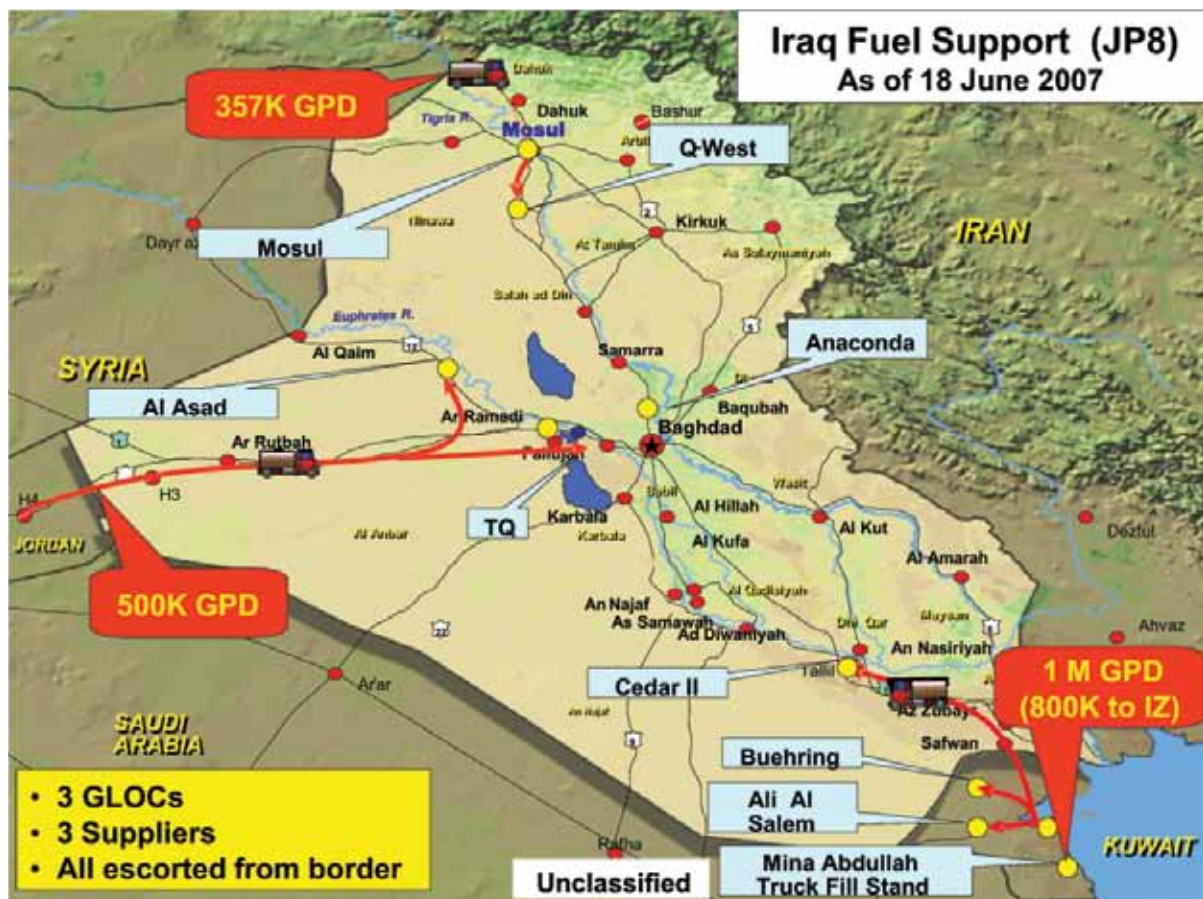
Since the entry of U.S. forces into Afghanistan in 2001 and through the simultaneous support of two campaigns—Operations Enduring Freedom and Iraqi Freedom (OEF and OIF)—since 2003, the U.S. Central Command (CENTCOM) has expanded air, land, and maritime petroleum sustainment from 300,000 gallons per day to more than 5 million gallons per day. It has accomplished this expansion over contested and undeveloped ground lines of communication (GLOCs) and, in the case of Afghanistan, in a land-locked country with little modern infrastructure. U.S. forces have not faced such challenges since their support of the “Burma Road” of World War II.

OEF and OIF petroleum sustainment has relied on an intricate network of national and international

petroleum, political, and policy stakeholders, including the Department of State, regional country partners, the Defense Energy Support Center (DESC), the North Atlantic Treaty Organization (NATO), CENTCOM, combined and joint commands, service component commands, and military services. This world-class petroleum operation has leveraged commercial energy markets and integrated commercial distribution networks to support the military’s “last tactical mile” hub-and-spoke distribution. In the process, it has developed historic capabilities and achieved historic results.

The Strategic Petroleum Challenge

The CENTCOM area of responsibility (AOR) is 131 percent of the size of the continental United States,



LEGEND

GLOC = Ground line of communication

GPD = Gallons per day
IZ = Iraq

K = Thousand
M = Million

Q = Qayyarah
TQ = Taqaddum

FROM A LOGISTICS PERSPECTIVE, AFGHANISTAN MAY BE THE MOST CHALLENGING AREA [IN WHICH THE] UNITED STATES HAS EVER CONDUCTED COMBAT OPERATIONS.

—MAJOR GENERAL KENNETH S. DOWD,
CENTCOM DIRECTOR OF LOGISTICS, 2009

encompassing 4.6 million square miles and 20 countries. By contrast, the continental United States consists of 3.5 million square miles. Afghanistan is larger than the state of Texas and has no organic petroleum refining capability, which means that all petroleum support must be imported from outside its landlocked territory.

On any given day in its AOR, CENTCOM receives more than 5 million gallons of fuel through a combined fleet of more than 2,000 contracted commercial fuel trucks and manages 200 million gallons of contracted petroleum storage spread across the AOR in support of land, air, and maritime forces. CENTCOM, in partnership with its strategic national partner, DESC, acquires 99 percent of its petroleum requirements from regional commercial suppliers and refineries in the Gulf and Central Asian States, Turkey, and Pakistan.

These regional commercial energy enterprises are either owned or controlled by host-nation governments. As a result, political-military engagement with those governments is needed for DESC petroleum regional acquisitions and for services (distribution) contracts in support of CENTCOM requirements. A prime example is the establishment and maturing of DESC contracts for CENTCOM forces in Iraq.

OIF Strategic Fuel Initiatives

At the onset of OIF in 2003, the only source of regional petroleum support was the post-Operation Desert Storm legacy arrangement with the Government of Kuwait. Under this system, DESC contracted with the Kuwait Petroleum Corporation to provide petroleum support to U.S. forces. The commercial movement of fuel did not extend beyond the Kuwait-Iraq border because of the security challenges posed by driving in Iraq. All internal distribution within Iraq was provided by organic military service capabilities, with U.S. Army Central having Title 10 inland petroleum distribution responsibilities for the Combined Joint Operations Area (CJOA).

By 2006 and 2007, the Iraq CJOA petroleum concept of support had evolved into three strategic petroleum GLOCs entering Iraq from Turkey, Jordan, and Kuwait. DESC contracted commercial fuel trucks to deliver up

to 2 million gallons of fuel per day into Iraq as far forward as military general support hubs.

To accomplish this same mission with Army units would have required 9,103 Soldiers assigned to at least one Army quartermaster group (petroleum and water) with 12 transportation (truck) battalions, one quartermaster battalion (petroleum supply), and 46 petroleum, oils, and lubricants truck companies to provide the needed theater-level fuel-handling and distribution capabilities. Put another way, it would have required 2,760 of the Army's 7,500-gallon tankers—4 times the entire Army inventory.

The Iraq CJOA petroleum concept of support set the stage for success in the 2007 OIF surge and remains the baseline for adjusting enduring support during and after the responsible drawdown of U.S. forces from Iraq.

Contractor-Owned Base

One base in southwest Asia consumes, on average, more than 1 million gallons of fuel every day, supporting airlift, aerial refueling, reconnaissance, and strike missions throughout the CENTCOM AOR. Until 2006, all fuel handling at this base was provided by U.S. Air Forces Central (AFCENT) organic tactical capabilities (receipt, handling, and storage in fabric fuel bags).

In response to a CENTCOM-validated requirement, DESC in 2004 contracted for 8 million gallons of storage capacity at a commercial-standard Defense fuel supply point (DFSP) owned and operated by a contractor and located near the base. The DFSP began operations in 2006, and its success allowed the number of Airmen deployed to support AFCENT operations to be reduced.

In 2009, through a second contractor-owned and contractor-operated (COCO) initiative, DESC established a 22-mile petroleum pipeline to connect to the DFSP. The COCO DFSP receives aviation fuel delivered to the AOR by commercial tanker ships (the average tanker load is 12 million gallons) from regional world suppliers under DESC contracts. The pipeline increased daily receipt capability at the base from 1 million gallons (all delivered by truck) to more than 1.5 million gallons.

These two COCO initiatives enabled AFCENT to reduce the tactical fuel terminal's size and associated manpower (approximately 65 personnel), increased the base's receipt capability by 50 percent, and created a more dependable, dedicated pipeline operation. Several months of negotiations with government-owned or

Fuel support in Iraq used three strategic petroleum ground lines of communication entering from Turkey, Jordan, and Kuwait (at left). Contracted commercial fuel trucks delivered up to 2 million gallons per day in Iraq as far forward as military general support hubs.

-affiliated energy companies were required to gain the permissions to pursue these strategic initiatives.

OEF—The Ultimate Challenge

Defense Logistics Agency personnel believe that Afghanistan is the most challenging CJOA to supply with fuel. Not only does Afghanistan have no organic oil production or refining capability, but it is a land-locked country with an austere distribution infrastructure. On average, the order-ship time for petroleum originating from Central Asian sources is 21 to 30 days.

Fuel enters Afghanistan by rail tank cars and is delivered to a terminal 6 kilometers inside the border; this is the terminus of the country's only rail line. The fuel is then carried by commercial trucks over unimproved roads, where the trucks face exposure to bad weather (the Salang Pass is notorious for snow) and enemy attacks and must hurdle a shadow network of local and national customs and security requirements.

Since 2002, CENTCOM and its strategic petroleum support partners (DESC since 2002, NATO since 2007) have increased fuel storage capacity in Afghanistan from roughly 100,000 gallons to more than 30 million gallons (with up to 12 million of those gallons in contracted commercial steel-tank facilities) to meet a demand that has grown from 40,000 gallons per day in 2002 to more than 1.1 million gallons per day in 2009.

Partnering With DESC

Starting in 2007, CENTCOM partnered with DESC to shift most petroleum sustainment in Afghanistan away from the Southern GLOC, which enters Afghanistan from Pakistan, to what is known as the Northern Distribution Network (NDN), which enters from the Central Asian States. This change increased the amount of petroleum entering by the NDN from 30 percent to 70 percent of all petroleum sustainment. Coupled with the shift to the NDN, DESC had the forethought to initiate a contract provision with its petroleum suppliers to

hold up to 9 million gallons of contractor-owned fuel (as a "commercial reserve") within Afghanistan to mitigate any ebb and flow in regional fuel distribution.

DESC also increased its Government-owned "strategic reserve" in and around Kabul from 2 to 5 million gallons. The strategic reserve and the commercial reserve together provide a shock absorber capable of withstanding major disruptions to petroleum sustainment.

DESC's contractors established a commercial fuel terminal outside of Bagram Air Base in 2007 and built a 2-mile pipeline to streamline Bagram's fuel resupply; this reduced fuel truck traffic coming onto the base. DESC has also initiated direct delivery to major direct support hubs at forward operating bases (FOBs) Fenty, Sharana, and Shank, thereby reducing hub-and-spoke fuel deliveries from Bagram to the other FOBs in Regional Command East.

Bagram is in the middle of an eight-phase petroleum master plan military construction effort to replace all tactical bag storage with an industry-standard steel-tank fuel facility. This effort, which began in 2007 and is scheduled to be completed in 2012, will provide Bagram with 12 million gallons of storage capacity and modern fuel facilities.

Finally, DESC is soliciting an additional 10 million gallons of contracted storage and enhanced delivery services for Regional Command East and for mutual support of other regional commands, based on a CENTCOM-validated 2009 to 2010 requirement. The combined effect of these actions will expand CJOA fuel storage and distribution capability while continuing to support current combat operations.

NATO Alliance Cooperation

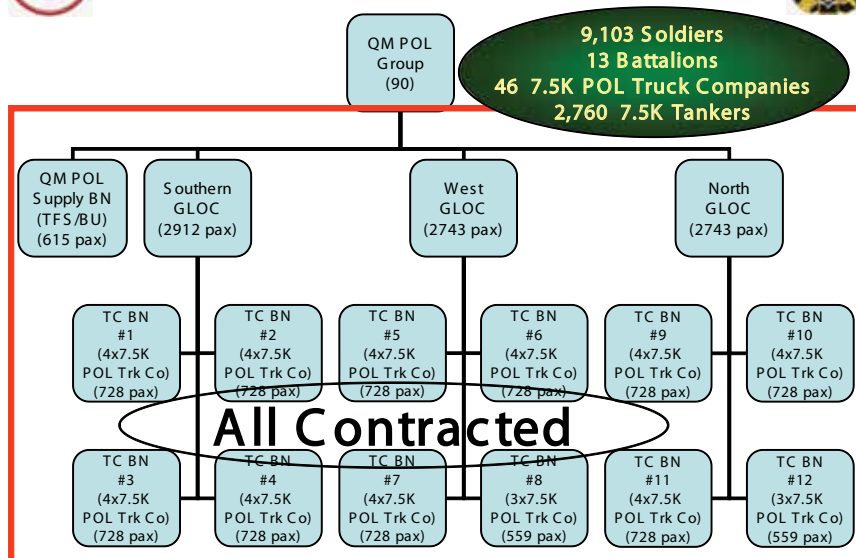
The Afghanistan CJOA is a NATO-led operation under the International Security Assistance Force (ISAF). This command structure requires a new level of strategic petroleum coordination and cooperation by CENTCOM and U.S. stakeholders with the alliance.

CENTCOM, in coordination with DESC and CJOA stakeholders, has met the growing OEF fuel requirement since the first arrival of U.S. forces at Bagram Air Base.

Delivering fuel without using contractors would have required the Army to use 9,103 Soldiers and 2,760 of its 7,500-gallon tankers—4 times the entire Army inventory.



Impact of OIF Contracted Solutions



LEGEND

BN = Battalion
 BU = Buehring
 GLOC = Ground line of communication
 OIF = Operation Iraqi Freedom
 pax = Personnel
 POL = Petroleum, oils, and lubricants
 QM = Quartermaster
 TC = Transportation Corps
 TFS = Truck fill stand
 Trk Co = Truck company

In 2002, Bagram's daily consumption was 40,000 gallons per day; today, Bagram accounts for approximately 500,000 gallons per day. To meet this growing demand in a multinational operating environment in one of the hardest geographical locations for importing fuel, CENTCOM, in cooperation with its strategic partners, has established an Afghanistan petroleum capabilities posture, mutually supported by the United States and NATO, to meet the sustainment requirements.

Partnering With JFC-Brunssum

In 2008, CENTCOM partnered with NATO's Joint Forces Command-Brunssum (JFC-B) to leverage the NATO-contracted capability to support U.S. forces in Regional Commands South and West. ISAF, as a NATO command element, remains the senior operational command in Afghanistan. The country was then divided into five regional commands (North, South, East, West, and Capital/Center). [Regional Command South-West has since been added.]

When it established ISAF, NATO tasked JFC-B to establish a fuel support plan for NATO forces in Afghanistan. In support of the deployment of additional U.S. forces to Afghanistan in 2009, the CENTCOM director of logistics directed the use of the existing JFC-B contracts to support U.S. forces in Regional Commands South and West. This decision was based on several factors, including—

- ❑ The need to demonstrate U.S. support of the alliance effort.
- ❑ The need to provide flexibility in sustainment (employing multiple commercial suppliers).
- ❑ The inclusion of contractor-provided storage in the JFC-B contract.
- ❑ The pre-existing NATO contractor presence in Regional Commands South and West.
- ❑ The offer of the NATO contractor to distribute to battalion FOBs, thereby reducing the requirement for military fuel trucks.

This alliance relationship ensured that the 300-percent increase in U.S. fuel requirements during 2008 and 2009 was met without affecting the very dynamic operational posture for Regional Commands South and West. CENTCOM's mutually supporting CJOA petroleum arrangement with DESC (the U.S. national provider) and JFC-B (the NATO provider) combined the best



In 2007, U.S. Central Command partnered with the Defense Energy Support Center to shift most Afghanistan petroleum sustainment from the southern ground line of communication (GLOC), which enters Afghanistan from Pakistan, to the Northern Distribution Network, which enters from the Central Asian States.

of each agency's capabilities to meet the ever-shifting petroleum requirements. This national and international strategic petroleum construct will continue to evolve and change over time to meet the U.S. and NATO/ISAF commanders' strategic goals and posture.

CENTCOM will continue to seek additional semi-permanent and permanent U.S. and contracted fuel storage in order to mitigate risks from disruption of the distribution system and improve quality control of stored fuel. CENTCOM has begun this process with DESC and JFC-B and will continue to hone its battle-field support. As the responsible drawdown of U.S. forces in Iraq continues, CENTCOM will capture lessons learned and apply best practices in fuel supply, storage, and distribution to ensure outstanding support to the Soldiers, Marines, Sailors, and Airmen in Afghanistan.

COLONEL JEFFREY B. CARRA WAS THE CHIEF OF THE JOINT PETROLEUM OFFICE, J-4, U.S. CENTRAL COMMAND, WHEN HE CO-WROTE THIS ARTICLE. HE IS A GRADUATE OF THE ARMY WAR COLLEGE AND HOLDS A MASTER'S DEGREE IN ADMIRALTY LAW FROM TULANE UNIVERSITY.

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Extracting Army Forces From the Field—A Logistician's Perspective

BY LIEUTENANT COLONEL JERRY B. STEINKE, MNARNG

Field Manual 3–0, Operations, defines retrograde as an “organized movement away from the enemy.” In order to set the conditions for a successful retrograde, Army forces must reduce, or drawdown, their operations and logistics footprints to the maximum extent and as early in the process as feasible. In a stability operation, when Army forces leave a theater, backfill by a coalition force may not always be possible. In those cases, responsibility for security may transfer to the host nation's security forces, whether they are army, police, or border security forces. This transfer of security responsibility may take place in an unstable or fragile security environment.

With these considerations in mind, I would like to address the logistics-related tasks Army forces must undertake to conduct a successful drawdown and retrograde. Specifically, I will discuss the following actions from a logistics planner's viewpoint: avoiding negative images; determining what to retrograde; reducing commodities, vehicles, and weapons systems, both “white” and “green”; cleaning up bases; disposing

of personal property; managing contractor-controlled equipment; coordinating transportation, maintenance, and port operations; disposing of barrier materials; and managing containers. The bottom line for the logistician is that the concepts discussed in this article are easy to describe, but they are extremely difficult to implement on the ground.

Avoiding Negative Images

The first and foremost consideration during a military retrograde is the risk of creating negative images. One example of negative images generated by a retrograde operation was the abandoned vehicles and weapon systems left behind in Afghanistan by the Soviet military at the end of their occupation during the late 1980s that continued to litter the countryside.

To avoid such negative images, logistics planners must consider a more resource-intensive retrograde operation. They must consider expending resources to recover and retrograde equipment and supplies, even in cases where it is not economically prudent to do so, in



Spray foam is applied to the roof of a tent at the Contingency Operating Base Basra medical center in Iraq. Spray-foamed tents are left in place upon base transfer to the Government of Iraq. (Photo by SFC Jeffrey S. Mullet)

order to avoid leaving abandoned military equipment and supplies strewn across the countryside that would provide our enemies with a propaganda opportunity.

Determining What to Retrograde

Another critical task is identifying what to retrograde. Notwithstanding the risk of negative images created by abandoned equipment and supplies, the planner must still consider the cost, in resources and manpower, of a complete recovery and retrograde.

To the maximum extent possible, units should consume supplies and not replenish them in the months leading up to the final retrograde, including classes I (subsistence), II (clothing and individual equipment), III (petroleum, oils, and lubricants), V (ammunition), and IX (repair parts) and bottled water. Leaders must ensure that their units are aggressively reducing stockage levels and allowing normal consumption to draw down the remaining supplies.

When units are maintaining supply support activities (SSAs), careful consideration should be given to consolidating and closing them. Lines may be drawn down to zero balances and excess supplies retrograded during the time leading up to the closing of the SSA. Even as an SSA has its lines reduced to zero balances, using units can still order their supplies and parts through the SSA's Standard Army Retail Supply System computer, with supplies coming from a central SSA. In such cases, the SSA continues to act as a requisition and turn-in point, accepting non-mission-essential supplies and equipment from customer units for retrograde and receiving supplies pushed from the central SSA to the users. The policy for turn-in of supplies must be liberal—that is, easy to comply with—in order to encourage customer units to bring their excess supply items to the SSA rather than abandon them.

Commanders must be willing to accept some operational risk during the supply drawdown. One such risk is accepting a longer response time in reacting to insurgent activity or host-nation requests for logistics assistance because fewer supplies are on the ground. Lower stockage levels for commodities such as fuel and ammunition may be acceptable, provided those commodities can be pushed quickly in the event of an emergency. To reduce risk, U.S. forces can maintain a centralized logistics base in the vicinity of the port of embarkation that can provide emergency air resupply. The key is to reduce stockage levels to the maximum extent possible and as early as possible before final retrograde.

Reducing "White" Equipment

The next consideration is identifying what equipment may be left behind based on economic considerations. "White" (commercial off-the-shelf) equipment may be managed differently from "green" (specifically designed for military purposes) equipment. Examples

of white equipment include computers, televisions, washing machines, and non-tactical vehicles (NTVs). Because white equipment does not have distinct military markings, it can be transferred to the host nation without creating the negative public perception caused by leaving green equipment behind.

Planners must conduct a cost-benefit analysis of white equipment. Should U.S. forces consume their limited transportation assets to retrograde such equipment, which may already be near the end of its life expectancy, to the continental United States (CONUS) or another theater? Or should they transfer it to the host nation? In addition to the costs of repairing, packaging, and transporting white equipment, another factor is its compatibility with U.S. electrical, safety, and environmental standards. In the case of NTVs, assuming the vehicles meet U.S. safety and environmental standards, the cost of retrograde and reset will most likely exceed the vehicles' fair market value.

Planners need to take a hard look at cost versus benefit when it comes to deciding what used white equipment should be retrograded. If the cost to retrograde approaches the equipment's residual value, then it should be transferred to the host-nation government. Leaders can work with the host nation to coordinate where this equipment can be staged for subsequent transfer. Contracted labor, drawn to the maximum extent from the host nation's labor pool, can provide security and maintenance services for these systems in staging areas to ensure they are fully mission capable on the date of transfer. The host nation should be responsible for any maintenance after transfer.

Reducing "Green" Equipment

In the case of class V, units should conduct inspections for serviceability. If ammunition is unserviceable, it should be disposed of in place rather than retrograded. If the local defense forces use the same type of ammunition and are considered reliable, transferring serviceable ammunition to them should be considered. Rather than retrograding serviceable ammunition to CONUS, consideration should be given to establishing a theater ammunition holding area or retrograding it to another theater. Finally, as with other classes of supply, the flow of class V into the theater should be turned off as early as possible and ammunition consumed to draw down stockage levels and avoid having to retrograde large quantities.

Class VII (major end items) requires special consideration in retrograde planning. For green equipment, care must be taken to preserve sufficient combat power through the close of the retrograde operation in order to provide adequate force protection. Class VII systems that the planner should consider keeping in theater until the final echelons depart include materials-handling equipment (MHE), transportation assets, and force

protection equipment. However, commanders must be willing to take some operational risk in order to draw down the “mountain” of equipment U.S. forces typically have with them, as was the case in Iraq at the close of 2009.

Since wheeled weapon systems, such as mine-resistant ambush-protected (MRAP) vehicles and M1151 up-armored high-mobility multipurpose wheeled vehicles, can move on their own, planners should consider retrograding the bulk of their heavier tracked systems earlier in the operation. A reserve of heavy weapon systems, such as Abrams tanks, Bradley fighting vehicles, and howitzers, may be staged in the vicinity of the port of embarkation to mitigate risks. For these systems to be available in an emergency, planners must ensure that adequate heavy equipment transporters are available to move them.

Class VII green equipment can be sorted for retrograde based on whether or not it will return to home station (early retrograde equipment) or enter an Army-managed reset program. The Army Materiel Command (AMC) manages reset programs and may be tasked to accept these selected systems in theater, taking them off the unit’s property book. It is then AMC’s responsibility to retrograde this equipment.

Units can turn in theater-provided equipment to an in-theater, AMC-operated redistribution property accountability team (RPAT) “yard” for disposition. For large units, a mobile RPAT can travel to the unit’s location and take possession of the theater-provided equipment to be turned in on site. AMC is then responsible for maintenance and retrograde.

During this retrograde process, leaders must be flexible concerning the maintenance readiness of equipment being turned in. “As is complete” should be considered as the standard for units turning in equipment to an RPAT yard for retrograde. Class III leaks should be a priority in order to get equipment through U.S. Customs and on to sealift.

MHE is critical to a successful drawdown and retrograde and must be kept forward to the very end of operations in each area. Since keeping this equipment mission capable may be difficult because of a lack of repair parts, units may have to resort to controlled substitution or cannibalization to maintain a minimum quantity of functional MHE. Another option is contracting for MHE, if available.

My firsthand experience is that warfighters are loath to surrender any of their rolling stock and weapon systems. They generally want to keep this equipment until their units redeploy rather than retrograding it to meet a schedule that does not tax available transportation assets.

However, class VII items cannot all be transported on the final day of operations; they must be drawn down over a period of time that available transportation assets can support. Logisticians must advise their leaders of

the importance of enforcing a retrograde schedule for class VII that is supportable—which means enforcing timely turn-in of equipment by warfighters. Leaders, with assistance from planners, must set both near-term (monthly) goals and end-state goals for the drawdown of equipment and supplies and then hold subordinate commanders responsible for meeting those goals.

Class IX items represent a challenge for the logistics planner during retrograde operations. It is imperative to draw down supplies. However, as stockage levels are drawn down, systems that become not mission capable (NMC) awaiting parts will remain NMC for longer time periods because of the longer leadtimes required to receive repair parts.

Three methods are available to mitigate this problem. First, a transportation priority system can be implemented that allows leaders to place a higher priority on certain repair parts required for critical systems. Second, the maintenance activity can be authorized to maintain a larger amount of shop stock for certain critical systems, such as MHE and transporters. Third, the variety of systems that have the same capability, such as different versions of the MRAP, can be drawn down.

Cleaning Up Bases

As a part of the retrograde process, logisticians work closely with the engineers who have primary responsibility for base closure and transfer. “Base closure” occurs when U.S. forces relinquish control of the land to the landowner, with no host-nation forces occupying it. “Base transfer” occurs when U.S. forces relinquish control of the base to host-nation forces, who will continue to operate the base. It is prudent to return a base that is fully functional to the host nation’s security forces. In this way, the host-nation forces can immediately conduct operations in support of the U.S. forces, which are concentrating on drawdown and retrograde.

Because of the number of steps and the time involved in closing or transferring a base, planners must adopt a closure or transfer schedule as early as possible, giving the battlespace owner (BSO) time to properly complete the process. The BSO should schedule base closures or transfers over a period of time—several months, for example—rather than conducting all of them at once. This avoids the requirement to surge transportation assets; availability of transportation is always a limiting factor.

Engineers lead the base closure or transfer effort, and logisticians work closely with them to provide support. Base closure or transfer requires the following major steps

- Determining legal ownership of the land.
- Completing an environmental survey of the site.
- Removing and disposing of solid waste.
- Closing any hazardous wastewater lagoons.
- Closing any incinerators.

- ❑ Closing any firing ranges.
- ❑ Conducting an inventory of real property (permanent structures).
- ❑ Conducting an inventory of personal property.
- ❑ Accounting for and removing containers.
- ❑ Removing personal property that will not be transferred to the host-nation government.

The amount of time involved in completing these steps will vary depending on the size of the base and environmental issues. U.S. policy is to turn over a base that meets applicable environmental standards; any environmental remediation takes time and resources. Planners should consider granting “amnesty” to units and individuals during the base cleanup period to encourage tenant units to turn in all excess supplies and equipment that have not been brought to record.

Disposing of Personal Property

Logisticians manage disposition of personal property on bases being closed or transferred. If a base is to be closed, 100 percent of the personal property must be removed. If a base is being transferred to the host nation, leaders must determine what personal property will be transferred to the host nation and what will be retrograded or otherwise disposed of. If the base is being transferred, it is prudent to transfer a sufficient amount of personal property so the host-nation forces can continue to operate the base without interruption.

Typical examples of personal property to be considered for transfer with the base include concrete bunkers, concrete T-walls, other barrier materials, guard towers, troop housing such as tents or containerized housing units, latrines, shower units, generators and power distribution systems, structures and scanners used at entry control points, other portable buildings, heating, air conditioning, and ventilation systems, fuel tanks, water tanks, water distribution systems, water heaters, and furniture.

In Iraq, it is impractical and uneconomical to move tents that have been “spray foamed” to add insulation, reduce energy consumption, and improve troop living conditions. These tents are converted from personal property to real property when the spray foam is installed and remain with the base upon the base’s transfer to the host nation.

Before conducting a joint inventory with host-nation representatives, the BSO responsible for base transfer must conduct a thorough inventory of the base and verify that all personal property is documented on the BSO’s property book. If not, the BSO must bring all found-on-installation (FOI) property to record.

FOI property represents a huge problem for the BSO responsible for base closure or transfer. In cases of operations that have been conducted for a number of years, as in Iraq, large amounts of unclaimed equipment may need to be brought to record. Leaders must

become involved in this issue and ensure that subordinate commanders are bringing FOI to record.

Once this has been completed, leaders then can determine which personal property should be nominated for transfer with the base to the host-nation forces. This property may be labeled as foreign excess personal property (FEPP). The BSO must then submit his list of nominated FEPP through the chain of command and secure approval for its transfer.

Before conducting the initial joint inventory with the host-nation representative before a base transfer, the BSO should retrograde all personal property that has *not* been approved as FEPP. In the case of expensive, high-demand equipment such as generators, the BSO should conduct any planned exchange (replacing new or nearly new equipment with older substitutes) before conducting the joint inspection.

It is important to not create an expectation in the eyes of host-nation officials conducting the joint inspection that they will be receiving newer equipment that the BSO plans to replace before transfer. Leaders must ensure that host-nation officials understand that any equipment maintenance required after transfer is solely the responsibility of the host nation. If the host-nation entity that will take over the base has little or no knowledge or experience with base maintenance operations, the BSO should offer training on how to maintain the base after transfer.

At this point, all of the equipment identified as excess—that is, equipment no longer needed and not nominated as FEPP—must be either retrograded or disposed of on site. The BSO then will have to undertake a financial liability investigation for property loss to document the FEPP, recognize its loss to the United States, and remove those items from the BSO’s property book. During one deployment, commanders in Iraq were authorized to transfer up to \$30 million worth of FEPP to the Government of Iraq for each base being transferred. This process is repeated on each base as the drawdown continues and bases are transferred. Depreciated value, not acquisition value, is used in calculating the value of FEPP.

Conducting a complete and accurate inventory of all of the personal and real property on a base most likely will be beyond the capability of a BSO. The logistics planner should consider organizing and deploying teams of property book and supply subject-matter experts to the bases subject to closure or transfer to assist the BSO with this process. In Iraq, this capability has been contracted. These teams have been a tremendous asset in the base inventory process, speeding up the process and providing accurate and complete inventories.

Managing Contractor Equipment

One potential problem is determining the ownership of equipment controlled by contractors on a base. This

equipment may be owned by the contractor, or it may be contractor-managed Government-owned (CMGO) equipment. To prove ownership, the contractor should maintain property books listing equipment owned by the U.S. Government (CMGO) and equipment owned by the contractor. Any contractor-controlled equipment not appearing on the contractor's property book should be brought to record as FOI property belonging to the U.S. Government.

The logistics planner must also examine base life support service contracts on the bases, such as laundry and security services (a task often overlooked by the BSO.) This is true whether the base is serviced through the Logistics Civil Augmentation Program or individual contracts originally initiated through the purchase request and commitment process. In either case, the BSO must identify all current service contracts, including the unit managing the contract, the scope of services, and the service termination dates.

The BSO must review each contract to determine the method for notice of termination and then provide this notice to the contractors. The purpose of this review is to avoid obligating the U.S. Government to continue to pay for services on a base that the United States no longer controls or uses.

During preparations for closure or transfer, there likely will be a surge of work, to include preparing and uploading equipment that will be retrograded and base cleanup. Logistics planners must ensure that contracts are in place to support this manpower and equipment surge. The BSO must ensure that any solid waste is properly disposed of before closure or transfer. To synchronize the themes and messages of an orderly transfer, the base must appear in a clean and orderly state on the date of closure or transfer in order to avoid negative media attention.

To this end, the BSO must document the final condition of the base by taking photographs of the buildings and grounds just before transfer and even inviting media to the base to take photographs and view its condition. Then, if the host nation does not closely control the base after the transfer and the base's contents are ransacked by local nationals, U.S. forces can prove that this happened after the transfer and not before.

For force protection reasons, it may be necessary to evacuate contracted labor in phases, and in advance of U.S. forces leaving, so that on the date of transfer or closure, all contractors have already been evacuated. Logistics planners must develop and execute logistics support plans to use military personnel to support the troops remaining on a base to the very last day of U.S. occupation. This will cause logistics support to become very austere (that is, "expeditionary") in the final stages of U.S. occupation.

Coordinating Transportation

Transportation is clearly the limiting factor for base closure and transfer and retrograde operations. The

closures and transfers will take place only as fast as the transporters can retrograde containers and equipment to the ports of embarkation. Planners must ensure that adequate transportation and MHE assets are available through the conclusion of retrograde operations. On the final day of a base's occupation, U.S. forces must be able to move out in a single lift.

Leaders must require their subordinate commanders to establish and execute aggressive plans, including monthly and end-state goals, for retrograding excess class VII equipment and supplies as early as possible. Waiting until the last minute to retrograde large amounts of rolling stock and heavy pieces of equipment invites mission failure. Commanders can mitigate some of the operational risk by maintaining rapid reaction forces and a close air support umbrella and by coordinating with host-nation forces to provide at least some of the required force protection.

Even during a drawdown, the maintenance mission must continue. Logistics planners must ensure that adequate maintenance support is available in order to keep equipment mission capable. Self-contained mobile maintenance teams can set up in temporary shelters with their own power supply, tools, bench stock, and shop stock to conduct maintenance operations as required. One serious issue will be the inability to secure repair parts in a timely manner. Controlled substitution and even cannibalization may have to be authorized.

Because the logistics planner may be facing a virtual "mountain" of supplies, vehicles, weapon systems, containers, and other pieces of equipment to retrograde by sealift, developing adequate port facilities will be critical to retrograde success. The planner therefore must identify all potential seaports that can be used and then request use of those ports through the host nation. More than one port for retrograde will improve throughput and reduce operational risk. After negotiations for these ports are complete, planners then must allocate time and resources to improve the ports and staging areas, including security infrastructure, sterile yards, maintenance structures, communications, power generation, wash racks, and loading equipment.

Planners may look to using contractors, including local national contractors, for maintenance of the staged equipment, port security, and port operations. Because of the bottleneck U.S. forces will face at the seaports because of a lack of sufficient transportation assets and port facilities, it may take several months or even years to retrograde all of the selected equipment and supplies back to CONUS for reset and redistribution.

Disposing of Barrier Materials

Disposition of class IV construction and barrier materials is a special problem in the retrograde process. These materials include precast concrete bunkers, T-walls, and other barrier materials. The cost of handling

and transporting these items will far exceed their fair-market value; sufficient transportation assets most likely will not be available to retrograde them; and because of import restrictions, these items probably will have to remain in country. The most practical course of action is to turn these items over to the host nation, leaving them in their current locations or as close by as possible.

As an alternative, technology does exist to crush precast concrete. The rebar found inside can be recycled, and the crushed concrete can be used for roadways and other construction applications. The machinery for crushing the precast concrete can be moved from base to base to complete this mission. Such an effort will take a significant amount of time and expense and will have to be undertaken and completed by contractors after the departure of U.S. forces.

Using local national labor to the maximum extent possible for this task will provide jobs and have a positive impact on the local economy. However, this will only be feasible if the security situation allows it. Considering the cost of manufacturing these structures, host-nation leaders may want to stage or store them for possible future use in force protection.

Managing Containers

No discussion of retrograde operations would be complete without addressing containers. Container management takes considerable manpower and resources. As bases close and transfer, the BSO will have to deal with all of the containers in his battlespace. The BSO must have procedures in place, along with adequate trained manpower, to accomplish the following tasks:

Identify all containers on each base. Enter this information into the container management system to determine status and ownership (military owned, leased from contractor, contractor owned). Ensure that leased containers have priority for retrograde to avoid or reduce penalties.

For containers with no discernable owner, open them and inventory the contents. Sort, package, and retrograde all serviceable supply items for return to the Army supply system. Turn in all unserviceable items to the designated Defense Reutilization and Marketing Service site. In Iraq, mobile redistribution teams (MRTs) visit bases to assist the BSOs with this massive job. The teams include specialists in the areas of supply, maintenance, and transportation. When combined with an offer of “amnesty,” the MRT is an extremely effective tool for policing up and turning in excess supplies, equipment, and containers.

Inspect each container to determine its condition, including whether or not it is seaworthy. Teams trained in accordance with the International Convention for Safe Containers carry out this manpower-intensive task. In the case of a container that is not seaworthy, the inspectors determine if it can be repaired. If it cannot be

repaired, it is a candidate for local disposition when no longer required for military use. If the container can be repaired economically, it must be retrograded to a container repair point. This repair mission may be accomplished using local national contracted support.

Empty, serviceable containers must be retrograded to an empty container control point for further use.

These tasks are usually managed by the BSO's container control officer. Containers require intensive management. As with rolling stock, the BSO may not be motivated to go out into his battlespace and identify and inventory all of the containers found there. The more containers the BSO finds, the more work he creates for the Soldiers—because all of this materiel must be inventoried, sorted, packaged, and disposed of. This is why employment of MRTs is so important.

The BSO must verify that all tenant units on the base have adequate numbers of serviceable containers to retrograde their equipment. The logistics planner must ensure that each BSO is granted the authority to require all tenant units on the base to fully participate in the container management program. This authority is necessary to avoid gaps in coverage on the base and to ensure that all containers are inventoried and inspected.

Equipment and supply retrograde must be synchronized to personnel flow. Logistics planners must ensure that logistics units and teams are adequately manned to support ongoing logistics services during the drawdown, including maintenance assistance teams, container repair teams, mobile redistribution teams, property accountability teams, transporters, and U.S. Customs inspection teams.

Planners and leaders must be flexible in how they use this manpower. One approach is to move these teams based on the base closure or transfer schedule. Planners should consider using local national contract support to surge all of these services.

The bottom line is that, in order to ensure that the maximum amount of Army materiel is preserved and retrograded, transportation assets are not overwhelmed in the final phase of the retrograde, and U.S. forces project to the world a responsible and orderly retrograde, leaders at all levels must aggressively execute the drawdown of materiel in an orderly and disciplined manner and as early in the process as possible.

LIEUTENANT COLONEL JERRY B. STEINKE, MNARNG, WAS THE ASSISTANT CHIEF OF STAFF, G-4, OF THE 34TH INFANTRY DIVISION, DURING HIS DEPLOYMENT TO IRAQ. HE IS A GRADUATE OF THE ARMOR OFFICER BASIC COURSE, THE COMBINED ARMS AND SERVICES STAFF SCHOOL, THE SUPPORT OPERATIONS COURSE, AND THE COMMAND AND GENERAL STAFF OFFICER COURSE. AN ATTORNEY IN PRIVATE PRACTICE, HE HOLDS A B.S. DEGREE IN EDUCATION FROM BEMIDJI STATE UNIVERSITY, A MASTER OF MANAGEMENT AND ADMINISTRATION DEGREE FROM METROPOLITAN STATE UNIVERSITY, AND A JURIS DOCTOR DEGREE FROM WILLIAM MITCHELL COLLEGE OF LAW.

Fostering a Good Relationship With Contractors on the Battlefield

BY MASTER SERGEANT ARTHUR HARRIS, JR., USA (RET.)

Since the beginning of Operation Iraqi Freedom (OIF) 7 years ago, contractors have participated as force multipliers to offset the logistics burden created by continuous U.S. military operations. Throughout the operation, skeptics have argued that contractors do nothing more than waste money from taxpayers and our Government. This misconception and a lack of proper understanding of the role of contractors ultimately slows down and interrupts support to the warfighter. The Army needs the expertise of contractors more than ever during the OIF drawdown. This article provides a snapshot of the relationship between military personnel and contractors and underscores the importance of reconciling the relationship between the two.

A Good Working Relationship

A partnership is formed when contractors accompany U.S. forces during contingencies and humanitarian missions. Field Manual (FM) 3-100.21, Contractors on the Battlefield, states, “While contractors consistently support deployed armed forces, commanders need to fully understand their role in planning for and managing contractors on the battlefield and to ensure that their staff is trained to recognize, plan for, and implement contractor requirements.” This statement is true; however, maintaining a good working relationship with the contractor should be kept in mind, too.

Working with contractors is not rocket science, but understanding their purpose and treating them as if they are part of a military unit is significant. Failing to



understand the importance of contractor support can lead to potential problems.

In their 2005 book, *Resolving Conflicts at Work: Eight Strategies for Everyone on the Job*, Ken Cloke and Joan Goldsmith outline “unclear roles and responsibilities” as a source of workplace conflict. Cloke and Goldsmith write that the first strategy in resolving conflict is to transform “the culture and context of conflict” in the organization. The Army needs change agents to alter the mindset of Soldiers toward working with civilian contractors. Changing this mindset will require Soldiers and leaders to understand their roles and responsibilities as well as those of contracted logisticians.

Understanding Roles

In order for Soldiers to know the contractors’ current role in a theater of operations, they must understand the difference between augmentation support and operational control (OPCON). Under the augmentation support role, military functional areas are supplemented with civilian contractors who perform functions and services specified by the Government. However, the contractor maintains supervision of all prime and subsidiary contracted employees. In an

OPCON environment, the contractor has total operational control in performing functions and services specified by the Government. The contractor is responsible for all technical aspects of the mission as well as administrative matters for all civilian employees.

What Soldiers often fail to understand is that contractor employees are supervised by contractor managers and not by the military. This administrative control of employees is probably the most significant misunderstanding in military and contractor relationships.

While deployed to Iraq, I found the OPCON role of contractors difficult for Soldiers to handle. They did not approve of having contractors in charge of most sustainment functional areas. Egos have no place in an environment that supports ongoing contingencies and

combat operations because they will surely cause a delay in support to the warfighter. Failure to communicate properly with contractors in OPCON roles creates additional work and unwarranted workplace conflicts. These actions can also cause the cancellation of goods and services.

Understanding Responsibilities

During OIF 09–11, I saw multiple changes to a Logistics Civil Augmentation Program (LOGCAP) requirement because military leaders refused to accept the advice of contractors in a highly visible functional area. Failing to allow contractors to perform within the performance work statement (PWS) caused resistance, which resulted in unfulfilled requirements for multiple unit rotations. Much time, money, and manpower were wasted when military leaders refused to listen to contractors.

In order to avoid misunderstandings that can cause problems in contract oversight, leaders should spend more time familiarizing themselves and their Soldiers with the contractor’s PWS. FM 3–100.21 states that a PWS “defines the government’s requirements in clear, concise language identifying specific work to be accomplished and incorporated into the contract. The . . . [PWS] is the contractor’s mission statement.” Although a PWS can be vague, units must not read into contractor performance requirements. The customer cannot direct that the contractor perform tasks without authorization from a warranted contracting officer or administrative contracting officer.

The biggest challenge the Army faces is getting units to read and comply with the largest PWS in theater, LOGCAP Task Order 159. The task order states that the contractor will provide base life support, corps logistics services support, and theater transportation throughout the Multi-National Force-Iraq area of operations. Failure to understand the PWS can lead units to submit unfounded violations that strain their relationships with contractors. This strained relationship is a major area of concern in the theater of operations.

Education is the foundation; the process must begin with commanders and filter down to the responsible personnel. As customers, Soldiers should have a solid understanding of what services the contractor provides. Where Soldiers go wrong is when they decide to tell the contractor how to do the work. The result is conflict between the parties.

Contract Oversight and Evaluation

Soldiers seeking contractors’ support should never tell the contractor how to perform a service or function. However, if the contractor is not performing within the PWS, tools are available to assist organizations in properly evaluating contractor performance.



A KBR subcontractor with Prime Project International begins his shift at the main laundry facility at Joint Base Balad, Iraq. (Photo by Galen Putnam, 402d Army Field Support Brigade.)



A KBR convoy leaves the convoy support center at Joint Base Balad, Iraq. (Photo by SPC Michael Camacho)

Improper oversight of contract performance has cost the Government millions of dollars. It is imperative that contracting officer's representatives (CORs) provide proper oversight for the contracts they are responsible for and that they evaluate contractors based on performance and not personal feelings or biases toward a particular contractor. The Government entrusts CORs to properly assess and document contractor performance. Proper military oversight minimizes conflict and is the only way that the contractor becomes fully integrated in supporting the warfighter.

The key to this success is the COR, who should be a subject-matter expert in the functional area that has contractor support. What I have found is that leaders are placing unqualified personnel as CORs in areas that warrant someone with an understanding of that function. Why place a mechanic in a supply support activity as the COR to oversee the performance of a contractor when his skill set does not match the contracted function? This is a disaster waiting to happen, which usually leads to conflict between the military and that contractor and ultimately slows down or even stops certain operations.

Based on my experiences, I believe the unit fails when it does not appoint the right person at the right time to oversee that particular functional area. That failure worsens when CORs lack basic contracting knowledge or misinterpret the PWS, which leads to evaluations that are not properly constructed. Ultimately, failing to properly evaluate performance places an additional strain on the relationship with contractors. This has proven true when individuals have their own agendas and refuse to understand the importance of proper oversight.

Education

The one resource that can mitigate potential issues in military and contractor relationships is education.

In the complex world of contracting, education is imperative to effective contract oversight. Understanding contracts and contracting provides operational commanders with the flexibility to determine when and where contracting is a viable way to satisfy unit needs. Having a fully educated understanding of contracting prevents a leader from creating situations detrimental to the unit's relationships with contractors. Leaders who fail to educate themselves on the contracting process run the risk of logistics failure. In a contingency environment, proper logistics support can be a deciding factor between the life or death of our Soldiers.

In contracting, unknown roles and responsibilities can damage the working relationship between military units and contractors on the battlefield. Without some form of resolution, organizations may fail to reach their intended goals. The misconception of contractors' roles and responsibilities has overwhelmed commanders and other leaders for years and has created undue stress on the contractors obligated to support them. Confusion has also caused serious cost-control and oversight issues. However, if military leaders and contractors mitigate potential problems through open communication and education (technical and PWS-specific), a better working relationship will result.

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Conducting Global Container Management Training Online

BY THOMAS CATCHINGS

Initiatives developed by Major General James L. Hodge while he was the commanding general of the Military Surface Deployment and Distribution Command (SDDC) identified the need to provide deploying Soldiers and units with critical container management training before deployment. SDDC's Global Container Management Division launched a distance learning module in August 2009 to provide "just in time" container management training to deploying units.

The module was built through a collaborative effort among the Army Medical Department Center and School's Production and Development Division Center for Distributed Learning at Fort Sam Houston, Texas; the Army Combined Arms Support Command's Training Support Directorate at Fort Lee, Virginia; and SDDC. It was launched on the Army Transportation Center and School website.

Putting the training on the Transportation Center and School website makes it available at all levels across the Army and allows the program to be reached by more Soldiers from a wider variety of military occupational specialties. Web-based training also reduces the need to send out global container management training teams or bring deploying personnel to Fort Eustis, Virginia, to meet deployment training requirements.

The Container Management Course is now available online through the Army Transportation Center and School Blackboard portal. The course provides information on the management and tracking of all containers carrying Department of Defense cargo moving in or outside of the Defense Transportation System from origin to destination and the return of emptied assets to their owners.



Leaders assigned to the U.S. Central Command (CENTCOM) area of responsibility have been using the program as a training tool for Soldiers needing access to the Integrated Booking System-Container Management Module (IBS-CMM). IBS-CMM is a web-based tool designed for easy entry and retrieval of container management information. It is also the program used to provide leaders with visibility of containers in the theater and throughout their life cycle.

"In the field, those who have already conducted the training cite it as a valuable tool in their execution and management of container assets in the theater," said Kenneth Queensberry, a training analyst for the Training Support Directorate. "It will save Soldiers valuable time in preparing for deployment," said Robert Friedman, former supervisor of traffic management for SDDC. "Now units can spend more time with their families before they deploy while still learning the skills necessary to successfully manage their container assets."

A mobility noncommissioned officer-in-charge (NCOIC) took the online global container management course and noted the lack of training that has been given to Soldiers who have deployed to the CENTCOM area of responsibility before this training was available. The NCOIC also commented on the usefulness and Soldier friendliness of the training module.

The Container Management Course, 551_CMC-101N, can be accessed through the Army Transportation Center and School Blackboard website located at <https://trans.ellc.learn.army.mil/webapps/portal/frameset.jsp>. Users must have an AKO/DKO username and password. After logging into the website, click the "Community" tab and then type "Container" into the "Organization Search" box to the left side of the screen to access the training. To enroll, select the "Enroll" button.

Soldiers who enroll must complete a 40-hour series of modules that culminates with an exam. Further information about the online Container Management Course can be obtained by sending an email to thomas.catchings@us.army.mil.

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Interagency Logistics Training: Perpetuating the Whole of Government Approach to Disaster Logistics

BY DR. BILLY J. DAVIS

During times of natural and manmade disasters, effective and efficient logistics operations become the lifeblood of survivors and serve to directly mitigate pain, suffering, and collateral damage. In a logistically perfect world, interagency logisticians would arrive at the scene of a disaster and work together seamlessly to provide humanitarian assistance to survivors. Unfortunately, that is not the case because each responder organization (large and small) has its own way of doing business. These differences in operating procedures often result in redundancy, supply-chain bottlenecks, and reduced or excess services and supplies to survivors. Training and working together before the disaster can improve logistics processes and make interagency logisticians more effective in aiding suffering populations.

To improve training for disaster logistics, the Army Logistics University (ALU) and the Federal Emergency Management Agency (FEMA) have collaborated to develop the Interagency Logistics Course (ILC). This course fills a much-needed training void in disaster logistics by embedding the “whole of Government” approach into a logistics-based curriculum designed to train key logisticians to work together before an event takes place. FEMA is the course sponsor, and the Joint Staff J-4 is the senior mentor.

Challenges of Agency Interaction

Disaster events, such as Hurricane Katrina, this year’s earthquake in Haiti, and tsunamis in the Pacific islands, have shown the world that logistics is most effective when served with a healthy dose of “unity of effort.” When military and civilian departments and agencies with responsibilities for reacting to Federal, State, and local emergencies (natural and manmade) train together before the event, the result is more effective and efficient logistics operations.

Key Disaster Response Authorities

- **Robert T. Stafford Disaster Relief and Emergency Assistance Act**
- **Homeland Security Act of 2002**
- **Defense Against Weapons of Mass Destruction Act of 1996**
- **Public Health Security and Bioterrorism Preparedness and Response Act of 2002**
- **Post Katrina Emergency Management Reform Act of 2006**
- **Homeland Security Presidential Directives 5, 7, 8, 9, 10, 20, and 21**
- **Executive Orders 12148, 12472, and 12656**

In an interagency environment, understanding the capabilities and practices of participating organizations—both governmental and nongovernmental—is tantamount to success. Past events have shown that friction and mistrust among organizations can be mitigated in the interagency environment through early communication, collaboration, and cooperation. This is a culture change for the Department of Defense (DOD), which is accustomed to strict command and control.

This is especially true when one considers that nongovernmental organizations are often the first to arrive on the scene of an event and historically have worked separately from Government agencies. Separation, mistrust, and misunderstanding of one another’s capabilities have caused massive waste of resources, bottlenecks in the supply chain, and general logistics dysfunction among agencies. That does not mean that survivors have not been saved or rescued; it means that operations could have been executed more efficiently and possibly more effectively.

THE FUTURE OF NATIONAL AND INTERNATIONAL SECURITY LIES IN INTEROPERABILITY AND COOPERATION AMONG THE SERVICES, THE INTERAGENCY, INTERNATIONAL PARTNERS AND NON-GOVERNMENTAL ORGANIZATIONS.

—ADMIRAL MIKE MULLEN



The jumble of items in this container demonstrates how poorly executed logistics coordination hampers the mission of getting needed items to the survivors.

inefficiencies and redundancies in the interagency supply chain.

If interagency logistics is the future of DOD logistics, agencies must collaborate before an event to build knowledge and trust. In Homeland Security Presidential Directive-5, Management of Domestic Incidents, the President directed the development of a National Incident Management System and a National Response Plan to align Federal coordination structures. This mandated collaborative approach helps eliminate seams and ties together a complete spectrum of incident management. Interagency logistics training that builds cooperation among DOD, the Department of Homeland Security, FEMA, and first responders before an event occurs will help further remove barriers of misunderstanding and mistrust.

It is often said that DOD is the thousand-pound gorilla of interagency logistics. However, despite all its capabilities, DOD is seldom the first responder to arrive on the scene of a disaster. For national and state emergencies, the mission of logistics support to survivors is generally accomplished first by volunteers, the National Guard Bureau, and state, local, and tribal organizations.

The international process of supporting disaster events is similar to the national process, except that the United Nations, the U.S. Agency for International Development, volunteer organizations, and other nongovernmental organizations are likely the first at the scene.

Participants in the first ILC class include logisticians and operators from the Army, Navy, Air Force, Coast Guard, FEMA, J-4, Army Corps of Engineers, Defense Logistics Agency, General Services Administration, U.S. Northern Command, American Red Cross, U.S. Agency for International Development, and state and local emergency management and volunteers.

Beginning in November 2010, the Interagency Logistics Course will be offered quarterly in residence at ALU or on site if required. DOD and FEMA participants may register for the course through the Army Training Resource Requirements System (ATRRS). Other personnel should contact the ILC course director by phone at (804) 765-4503 or by email at billy.davis4@us.army.mil for registration information.

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Improving Interagency Logistics

Perhaps the most important dynamic for improving interagency logistics is an open dialog before an event that allows each agency to clearly articulate its capabilities and the best point of entry into an event. Dialog among agencies will identify outdated policies, overlaps in responsibilities, and gaps in logistics support. Open dialog supports the ideal of interdependency and helps agencies to move away from stovepipe support that can hamper the overarching mission of supporting survivors.

ILC provides a tactical- through strategic-level overview of interagency disaster logistics and identifies parameters for a national logistics coordinator. The course offers a forum and logistics exercises for the exchange of best logistics practices from the interagency community. ILC provides participants with insights that are unique to response partners. Through interaction before a disaster, ILC can establish an understanding of the practices and policies among interagency partners. This understanding can improve and facilitate a more unified response to national and international disasters and emergencies—small or catastrophic.

ILC has proven that when you bring logisticians together from Government and nongovernmental organizations, they learn from one another. They collectively understand appropriate points of entry to support an event, better understand organizational capabilities, and identify logistics policies and practices that cause

Gulf War Logistics Records Donated to the Sustainment Community

During Operation Desert Storm, Lieutenant General William G. “Gus” Pagonis was known as the “logistics point man” for the U.S. Armed Forces. Not only was he responsible for the logistics plan for Desert Storm, General H. Norman Schwarzkopf, Jr., also put him in charge of executing that plan on the ground. General Pagonis held daily press briefings during operations and kept notes, after-action reviews, and other documents from the Persian Gulf War, creating a large personal archive. During a recognition ceremony held in his honor, Lieutenant General (Ret.) Pagonis donated his archive to the Army Logistics University (ALU) Library at Fort Lee, Virginia, on 17 May 2010. His donation is the first addition to ALU’s new Senior Sustainment Collection.

Persian Gulf War Logistics

Introducing General Pagonis at the ceremony, Major General James E. Chambers, the commanding general of the Army Combined Arms Support Command, cited Pagonis’s most recognized accomplishments. (General Chambers is now the J-4 for the U.S. Central Command.) “As the commanding general of the 22d Support Command [the Army’s theater logistics command], General Pagonis was responsible for the reception and onward movement of troops and equipment and their

sustainment in Southwest Asia,” said Chambers. “It was during this assignment that he successfully masterminded the logistics for the Gulf War. His logistics strategy during the war has been widely regarded as one of the greatest achievements of military history.”

Pagonis shared some of his experiences from this timeframe, outlining the adaptability needed in the first 4 months when the few logisticians available took charge of logistics operations. “We had sergeants doing the jobs of captains. It was a tremendous effort,” said Pagonis. He sees Desert Storm as the beginnings of the logistics branch that is today a reality. “It didn’t matter what your branch was; you were a logistician,” said Pagonis. “We tailored on the battlefield to meet the situation, and the logistical corps made all the difference.”

Desert Storm operations were modeled on the return of forces to Germany (Reforger) exercise—troops were flown in, equipment was in place on the ground, and other equipment arrived by ship. The goal was to sustain troops and equipment and move them forward on the battlefield.

In “Observations on Gulf War Logistics,” an article that General Pagonis wrote with Colonel Michael D. Krause in the September–October 1992 issue of *Army Logistician*, the authors write, “The creation of logistics bases was essential to sustaining the ground campaign.

The bases were intended to hold enough fuel, food, water, and ammunition to sustain the XVIII Airborne Corps and VII Corps during their punch into Iraq.” These logistics bases were set ahead of combat arms forces on the battlefield and provided, for the first time, flexible support to modern maneuver operations.

During his ALU visit, General Pagonis noted another logistics

Major General James E. Chambers, the commanding general of the Army Combined Arms Support Command; Lieutenant General (Ret.) William G. “Gus” Pagonis; and Barbara Mroczkowski, the acting president of the Army Logistics University (ALU), unveil a painting honoring Pagonis for his donation to the ALU Library. (Photo by Julianne E. Cochran, Army Sustainment)



Some of the many artifacts donated by General Pagonis to the Army Logistics University Library. (Photo by James Fortune, Fort Lee Visual Information Service Center)

success—Operation Desert Farwell. “We always forget Desert Farewell,” said Pagonis. “When the war was over, I was able to send people home, but I stayed. They gave me 6,000 individual ready reserves [IRRs] who never dreamed they’d ever be called up.” Those IRR Soldiers worked to fulfill an agreement made between President George Bush and the King of Saudi Arabia that all equipment would be sent back to the United States after the war. “We were given 2 years,” said Pagonis. “It was done in 8 months. The motto was, ‘As soon as this junk’s out of here you get to go home,’ and that’s all the logisticians needed to hear to make it work.”

Preserving and Sharing Knowledge

During the Persian Gulf War, Pagonis conducted about 2,000 interviews and had every press conference and interview videotaped. He kept video or audio records, photographs, books, magazines, operation orders, after-action reports, maps, monographs, and a plethora of briefing papers and historical documents. The resulting collection is approximately 1,100 linear feet. “These records really weren’t mine,” said General Pagonis during the presentation to ALU. “They were the United States Army’s that I held and collected.”

Pagonis had already received authorization to donate the records to Pennsylvania State University and the Army Military History Institute at Carlisle Barracks, Pennsylvania. He instead chose ALU, where the records can be put to continued use by the sustainment community. “I’m hoping by being [stored] here where logisticians are going to be coming together, we won’t make the same mistakes over and over,” said Pagonis.



General Pagonis signs a copy of *Moving Mountains: Lessons in Leadership and Logistics from the Gulf War*, which he co-authored with Jeffrey L. Cruikshank, for a Korean officer attending the Army Logistics University. (Photo by James Fortune, Fort Lee Visual Information Service Center)



“This is truly an exciting day for our library and for the university, since this is the first collection to be added to our new logistics library,” said Barbara Mroczkowski, the acting president of ALU. “We thank you [General Pagonis] very much, and know that we will take very good care of the materials that you have entrusted to us, while at the same time making them available to the greater community as a primary source of logistics information on the Army and on the Army’s involvement in the Gulf War.”

“The gift provides an essential resource for sustainment Soldiers, historians, and our researchers that will broaden their understanding of this very pivotal time in our history,” said General Chambers. “They are archive items that were done with great detail from a man with the insight to record what was happening, knowing that someday we would want to recall and learn from those lessons.”

Chambers noted the significance the records will hold for students at ALU. “Force sustainers will have access to important papers that illuminate the logistical push into Kuwait during Operation Desert Shield/Desert Storm,” said Chambers. “They will be able to see what was tried, what worked, what didn’t work, and then what corrections were made to make them work. These papers have a significant place in our Nation’s history and in our Nation’s military history, and it is a major honor for this library to house them.”

John Shields, reference librarian, formally accepted the Pagonis donation on behalf of the ALU Library, where the collection will be archived and available for official and research purposes. To recognize the donation, a bust of General Pagonis has been commissioned from Virginia State University for display in the library.

Donations of papers and other archival materials from other sustainment leaders are being solicited to add to the collection. Anyone interested in making a donation can contact the Army Combined Arms Support Command historian by email at steve.anders@us.army.mil or by telephone at (804) 734-0082.

—Story by Julianne E. Cochran

“Support at Altitude” for a Multifunctional Aviation Task Force

BY CAPTAIN MICHAEL R. MILLER



The doctrinal mission of a forward support company (FSC) is to provide agile, multifunctional logistics support to its maneuver battalion. When the supported unit is a general support aviation battalion (GSAB) with organic CH-47F Chinook, UH-60 Black Hawk, and medical evacuation (MEDEVAC) helicopters, the FSC must demonstrate flexibility and responsiveness as it provides organic ground maintenance, fuel, and distribution support.

That flexibility and responsiveness became exponentially more critical when the already diverse 7th Battalion, 101st Aviation Regiment (7-101 Aviation Battalion), 159th Combat Aviation Brigade, transformed into a multifunctional aviation task force 3 months before deploying to Operation Enduring Freedom (OEF) 09-11. The formation and mission expanded significantly as the organic GSAB absorbed AH-64 Apache and OH-58 Kiowa Warrior helicopters and prepared to support all 15 provinces of Regional Command-East in Afghanistan.

The five major mission sets that the battalion supported were air assault; aerial dignitary movements and aerial resupply; reconnaissance, security, and attack; quick reaction force; and MEDEVAC. Throughout this dramatic transformation, E Company, the 7-101 Aviation Battalion's FSC, was required to develop creative

solutions to accomplish its doctrinal missions while taking on additional missions necessary to provide agile “support at altitude” to this new formation known as Task Force Eagle Lift.

E Company Accomplishments

In its 12-month OEF tour, E Company supported Task Force Eagle Lift across the full spectrum of aviation support as the unit executed over 215 air assaults, transported over 85,000 personnel and 4,800 tons of cargo, launched over 1,200 reconnaissance and security missions, and supported over 900 MEDEVAC calls. By the end of its tour, E Company had issued 1.2 million gallons of aviation fuel and 100,000 rounds of ammunition and had conducted over 100 sling-load missions while the task force flew over 4,500 missions and 39,000 combat flight hours. Due in no small part to the agile support provided by its FSC, Task Force Eagle Lift flew more hours across a more diverse mission set than any other aviation task force previously deployed to Afghanistan.

To support its task force's diverse mission, E Company successfully restructured its task organization to meet new challenges during its combat tour. In addition to its normal fuel and maintenance missions, the company assumed duties as the task force's class V

AH-64 Apache and OH-58 Kiowa Warrior helicopters from Task Force Eagle Lift await fuel and ammunition at one of E Company's forward arming and refueling points in Afghanistan.



(ammunition) manager, was tasked with providing a consolidated arms room, and became the battalion's primary provider for force protection personnel. These new missions required the creation of new sections within the company, intensive cross-training to fill new personnel vacancies, and ultimately, the development of new tactics, techniques, and procedures (TTP) for accomplishing the mission.

A modular approach to task organization allowed E Company to pull Soldiers from each section to fill personnel requirements not doctrinally organic to the formation. By cross-training to meet these personnel shortfalls, Soldiers in E Company could be successfully plugged in and rotated as needed. This approach prevented mental burnout and facilitated midtour leave scheduling by minimizing the adverse impact on mission accomplishment. The development of new TTP gave the Soldiers of E Company ownership of their missions while maximizing flexible and responsive support to the task force's maneuver companies.

E Company Soldiers prepare to sling load 500-gallon collapsible fuel drums on a CH-47F Chinook. The fuel drums were prestaged to shorten response times during replenishment missions.

Task Organization

E Company's creative task organization enabled it to accomplish a variety of new tasks in addition to its doctrinal missions. Unlike FSCs in support of heavy or infantry brigade combat teams, E Company is doctrinally organic to the 7-101 Aviation Battalion. The battalion consolidated its formation at Bagram Airfield while deployed and assumed a general support mission to ground forces in its area of operations.

Despite being centrally located, the mission of the battalion task force required it to operate nearly everywhere in eastern Afghanistan and its FSC to occupy two outlying forward operating bases (FOBs) to provide class III (petroleum, oils, and lubricants) and V support. To do this after losing 10 personnel to a sister task force, E Company transformed its distribution platoon by creating three squads of 10 Soldiers each.

This platoon organization allowed two squads to support 24-hour operations at its two forward arming and refueling points (FARPs), while the third squad remained at Bagram to support contingency "jump FARP" missions and cold fuel operations. [A FARP is used by aviation units to place fuel forward on a battlefield in order to extend a helicopter's range or maximize its time over an objective. By placing fuel and ammunition as close to the helicopter's objective as the tactical situation allows, its turn-around time for fuel and ammunition is reduced and its support of troops is maximized. A jump FARP is temporary in nature and refers to a FARP that can be set up and torn down quickly and is able to "jump" from location to location.] Squads rotated every 3 to 4 weeks during steady-state operations and as necessary during periods of increased operating tempo (OPTEMPO).

Class III

While at the company's outlying FARPs, refueling personnel were required to work hand-in-hand with the FOB landowners, which included both U.S. ground units and North Atlantic Treaty Organization forces. Relationships at both FARPs became mutually supportive. E Company refuelers often provided ground units with fuel and ground maintenance support in exchange for life-support enhancements.



At one E Company FARP, located at a French outpost, refuel personnel often refueled French aircraft and, because of its austere location, assisted with the post's force protection by establishing fighting positions around the FARP and the French task force's class V storage area. These mutually beneficial relationships effectively demonstrated E Company's approach to unit support. By building strong partnerships at outlying FARPs and helping units at those FOBs accomplish their missions, E Company was ultimately better able to provide agile support to Task Force Eagle Lift.

Class V

To fulfill its class V mission, E Company formed an ammunition section to perform administrative, storage, handling, and issuing functions for class V. The ammunition section maintained day-to-day accountability of the task force's authorized basic load and replenished class V stocks as needed. The section consisted of four school-trained military occupational specialty (MOS) 89-series ammunition personnel (one MOS 89A ammunition stock control and accounting specialist and three MOS 89B ammunition specialists) who were augmented by two additional personnel (both MOS 91B wheeled-vehicle mechanics).

Lacking a traditional class III/V platoon and operating predominantly at Bagram, the ammunition section was assigned to the headquarters platoon and was directly supervised by the company's executive officer, an ordnance officer. This subject-matter expertise mitigated the effects of having nonammunition personnel assigned to the section and strengthened the section to the point that ammunition operations became a relative strength.

E Company maintained its modular approach to task organization with the consolidated arms room. A total of 10 Soldiers were pulled from assignments in other platoons to serve as armorers. With three to a shift and a noncommissioned officer-in-charge to float between

shifts, the armorers were able to provide 24-hour support. They used a sign-out system to account for the task force's weapons and sensitive items that were used during flights and day-to-day operations.

Arms room personnel of all MOSs were trained to perform small-arms maintenance at the unit level and post-flight weapons cleaning, effectively relieving flight crews of that chore and allowing them to focus on mission preparation and post-flight aircraft maintenance. This support shortened the 12- to 14-hour duty days of crews. E Company arms room personnel maintained and cleaned 426 weapons assigned to Task Force Eagle Lift's flight companies without a single weapon malfunction when it counted most.

By rotating personnel every 3 to 4 months, the consolidated arms room was able to maintain a robust support capability during rest and recuperation leaves and periods of increased OPTEMPO, much like the distribution platoon did.

Cross-Training

E Company's creative task organization was made possible by widespread cross-training. The company leaders' goal before deploying was to train each Soldier in a second MOS. By doing this, personnel shortages created by new missions could be filled from a broad pool of trained Soldiers and the lack of "appropriate" MOSs for these new missions could be overcome.

The company knew it would assume new missions in Afghanistan, so leaders placed a strong focus on training Soldiers in similar tasks in order to achieve the closest possible match of skills. For example, one FARP function is to provide class V rearmament; without organic MOS 15J and 15Y (OH-58D Kiowa Warrior and AH-64D Apache Longbow armament, electrical, and avionics systems repairers, respectively) Soldiers to perform this duty, E Company relied on cross-trained petroleum supply personnel to accomplish this mission.

Training was provided by armament personnel assigned to the battalion's attack and reconnaissance company and certified by a pilot in command (PC). The training resulted in FARP personnel being certified to handle and "hot" load .50-caliber



An E Company Soldier with military occupational specialty (MOS) 88M, motor transport operator, is supervised while rearming an OH-58 Kiowa Warrior. E company's 88M Soliders were cross-trained and worked alongside its 92F petroleum supply specialists at the company's forward arming and refueling points.

rounds, 30-millimeter rounds, and 2.75-inch rockets. By pairing closely matched skills together and certifying refuel personnel to perform multiple tasks, no additional personnel were required to man the company's FARPs.

Cross-training was equally emphasized in the maintenance platoon. Recognizing that maintenance personnel would most often be pulled to fulfill other tasks within the battalion and were E Company's primary source of arms room personnel, a premium was placed on having a wide variety of maintenance capabilities at all times with as few people as possible. Rather than limiting automotive maintenance to just MOS 91B Soldiers, all maintenance personnel were trained to perform wheeled-vehicle maintenance.

This same approach was also used with the company's 91Bs, who were trained to perform maintenance tasks normally assigned to 91Cs (utilities equipment repairers), 91Ds (power generation equipment repairers), and 91Js (quartermaster and chemical equipment repairers). The company's MOS 91Ws (metal workers) and 92As (automated logistical specialists) were trained to perform maintenance tasks on all ground equipment.

By cross-training all personnel within the maintenance platoon, E Company's maintenance supervisors maximized their support to the task force with limited personnel while avoiding increased repair time, no matter what type of vehicle or equipment required maintenance.

New Tactics, Techniques, and Procedures

E Company not only creatively reorganized itself to accomplish new missions but also developed new TTP to accomplish doctrinal missions. Aircraft refueling is a doctrinal mission, but it was by far E Company's most robust task and demanded the most creative TTP to be accomplished successfully.

FARPs operated by E Company were originally temporary in nature. Fuel was sling-loaded as necessary using 500-gallon collapsible drums for a designated time and pumped into aircraft using the advanced aviation forward area refueling system. This method often required additional fuel drums on short notice. To remedy this burden, E Company's distribution platoon ensured that additional drums were filled and rigged for sling load at all times. As operations increased, so did the number of drums that the platoon staged. A battle drill was developed to quickly alert the platoon's sling-load teams when additional drums were required on short notice.

The distribution platoon eventually took this battle drill a step further and devised a way to prepackage its jump FARP equipment in a John Deere Gator and accompanying trailer. This roll-on, roll-off capability ensured that minimal time was dedicated to packing, loading, and offloading the aircraft during time-sensitive support missions. Once loaded aboard the Chinook, prerigged fuel drums were picked up and the entire package was en route to its objective. The battle

drill for this support capability included fuel sampling and testing, equipment checks, and personnel notification in addition to equipment upload. By configuring all necessary equipment into a readily available package, the platoon could quickly load a Chinook, deploy to the site of its jump FARP, and be operational in as little as 12 hours following notification.

At one point during its deployment, fuel operations exceeded E Company's ability to maintain enough fuel drums. To overcome this shortfall, the company obtained the necessary equipment and emplaced a permanent fuel system supply point (FSSP) at one of its assigned FARPs. The FARP retained its rearmament capability and remained a predominantly Kiowa fuel point. However, the FSSP gave it the capability to support all U.S. aircraft and many coalition aircraft without the danger of operational demands exceeding resources.

This increased fuel capacity and the availability of a robust ammunition package enabled reconnaissance and attack aircraft to maximize station time in support of ground forces and reduce their turnaround time when fuel and ammunition were needed. By expanding capabilities beyond its doctrinal mission, E Company directly and positively affected Task Force Eagle Lift's tactical mission.

Expanded Support Mission

E Company assumed its class V support mission because of the aviation task force configuration the battalion assumed before deploying. By necessity, the mission normally executed entirely by the brigade's aviation support battalion (ASB) fell to FSCs in direct support of their line battalions. During Task Force Eagle Lift's OEF rotation, its Apaches and Kiowas were heavy consumers of class V (specifically 30-millimeter and .50-caliber rounds and 2.75-inch rockets) and constant attention was required to ensure that sufficient stocks of these munitions were available at all times.

E Company ensured that ammunition handlers were on site at peak hours to keep the ready ammunition storage area stocked with three full loads of class V for each aircraft in addition to the ammunition that was already placed at each aircraft's parking pad. Ammunition personnel in direct support of these aircraft worked with crew chiefs to restock parking pads each morning and identify which ammunition types were required in greater quantities.

Ammunition personnel conducted routine pickups from Bagram's ammunition supply point based on consumption rates during steady-state operations. When OPTEMPOs peaked during Afghanistan's national elections, having personnel and sufficient ammunition stocks onhand became particularly vital.

Urgent resupplies of class V were required at E Company's outlying FARPs. Working on site with the task force's Apache and Kiowa Warrior helicopters and maintaining close contact with the task force's



An E Company Soldier refuels an OH-58 Kiowa Warrior at one of the company's FARPs. In the foreground, 2.75-inch rockets are staged for rearming attack and reconnaissance aircraft.

tactical operations center enabled ammunition personnel to quickly load waiting aircraft with additional class V for movement to E Company's FARPs. The ammunition personnel successfully restocked one FARP in under an hour, allowing attack aircraft in the area to maintain valuable support to a ground unit in contact with the enemy.

To more completely meet the needs of its flight companies, specifically during rearming and refueling stops at its FARPs, E Company created class I (subsistence) sustainment packs that could be quickly and easily handed to pilots and crews while they were on the ground. These "brown bag lunches" usually consisted of consumable items that could be eaten quickly or stowed away for consumption during flight. During the colder seasons, sustainment packs included thermoses of coffee or hot chocolate. During night operations, they usually included Rip-It caffeinated energy drinks. E Company's goal in providing these "creature comforts" at its FARPs was to make its battalion's combat mission the sole focus of its pilots and crews while they were in the cockpit.

Because of the rugged terrain and the resulting isolation of some coalition FOBs, Afghanistan is an air-centric theater. This reality made it essential that E Company personnel become experts at sling loading during their OEF deployment. Many E Company Soldiers were already air-assault qualified, but because previous deployments to Iraq did not require a reliance on sling-load movements, many of E Company's personnel required additional sling-load training.

Pathfinder Support

E Company often worked with Task Force Eagle Lift's pathfinder platoon to rig loads for organic and supported units. Many loads, such as triple containers

(TRICONS) and Bobcat earthmovers, were considered nonstandard and required extra attention during rigging. During hookup operations, E Company relied on air-assault qualified personnel to attach rigged loads to Chinooks for movement. The sling-load personnel and the pilots moving the loads developed a close relationship and a level of comfort by working together daily.

E Company applied its creative support approach to pathfinder operations as well. The primary mission of Task Force Eagle Lift's pathfinders was the recovery of flight crews and passengers in the case of a downed aircraft. These missions usually accompanied a downed aircraft recovery team and were often long in duration.

To support these contingency missions, E Company used the "speed ball" concept and built a sustainment package that could be loaded aboard a Black Hawk helicopter by a buddy team. The package consisted of water and meals, ready to eat, to support 20 Soldiers for 24 hours, sunscreen, work gloves, and additional radio batteries.

A battle drill was developed in which the pathfinder team leader would call back to the task force's tactical operations center and request the package. E Company would be notified and could load the package onto a waiting aircraft for delivery to the pathfinders on the ground. This "speed ball" reduced the amount of class I taken by the pathfinder team, effectively reducing the Soldiers' combat load and increasing their mission readiness.

E Company's success in providing flexible and responsive support during OEF 09-11 was largely due to its creative problem-solving. Its approach to task organization, cross-training, and mission support ultimately maximized E Company's support capability.

Reorganizing its formation to meet new tasks in addition to its doctrinal missions enabled E Company to provide flexible support. This reorganization required E Company to cross-train its personnel to fill gaps created by these new and expanded missions. The company leaders' original goal was to give each Soldier in E Company a second MOS, and this proved to be a success. New approaches to mission support and the development of new TTP completed their approach to responsive sustainment for the 7-101 Aviation Battalion while deployed.

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Equipping the Combat Support Hospital: A Case Study

BY LIEUTENANT COLONEL CHARLES H. STRITE, JR.

The U.S. Army Medical Materiel Agency (USAMMA) at Fort Detrick, Maryland, is subordinate to the Army Medical Research and Materiel Command and serves as the Army's life-cycle management command for class VIII (medical materiel). The mission of USAMMA is to plan, synchronize, and provide medical logistics for health service support to forces conducting joint and full-spectrum operations by managing medical materiel life-cycle projects, equipping and sustaining the medical force, managing medical strategic centralized programs, and advancing performance excellence.

USAMMA performs its mission with the Army Materiel Command (AMC) in areas such as Army prepositioned stocks (APS), left-behind equipment (LBE), and reset. As the life-cycle management command for class VIII, USAMMA is responsible for equipping and sustaining medical units, which must be done using the Army Force Generation (ARFORGEN) model. The Army Medical Research and Materiel Command and USAMMA make up the medical generating force as it relates to equipping units under the ARFORGEN model for medical units.

To accomplish this task, USAMMA has developed the Medical Materiel Readiness Program (MMRP) to support the Army's most complex medical unit, the combat support hospital (CSH). The MMRP solution for addressing ARFORGEN CSH equipping issues focuses on three tenets:

- ❑ Define a CSH baseline equipment set to be maintained at home station.
- ❑ Equip the generating force medical training base.
- ❑ Control equipment not at home station through a well-defined, centralized medical equipment management program maintained by USAMMA by applying many of the concepts associated with the APS program.

This operating room suite in a combat support hospital (CSH) demonstrates the complexity of the equipment required for the CSH.

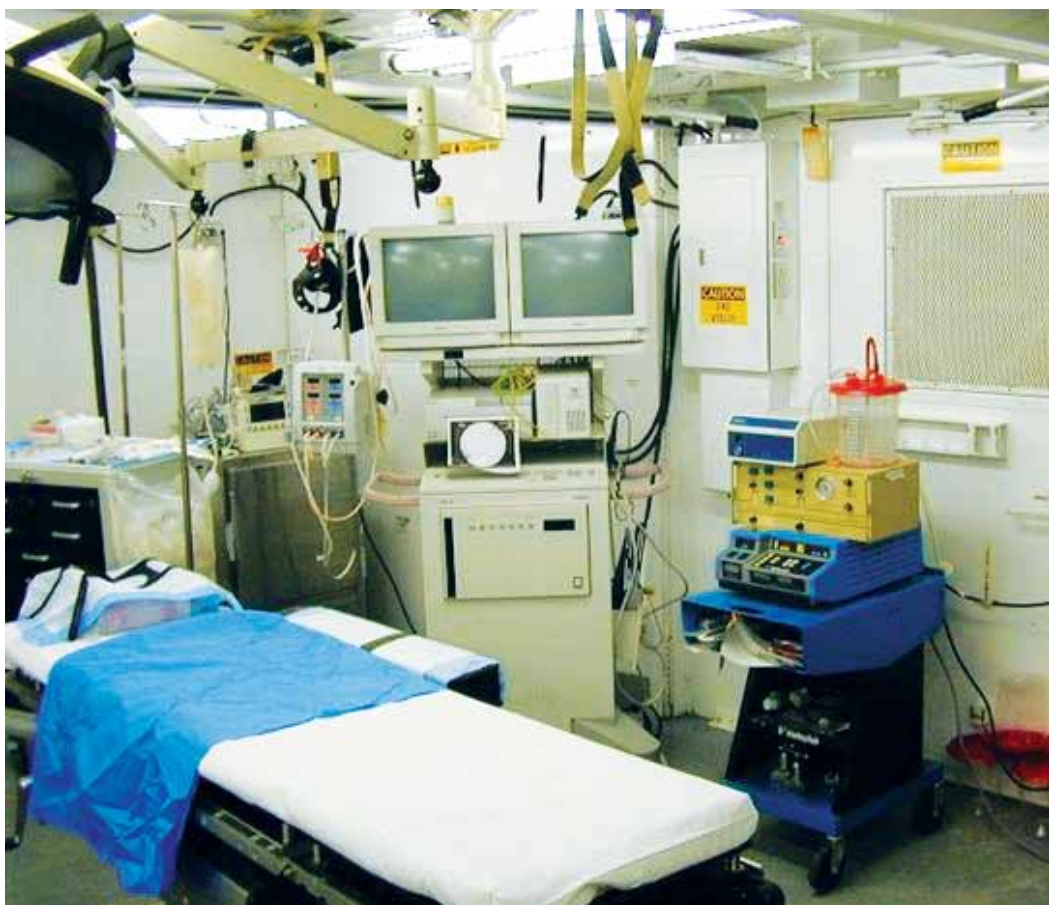
This article will discuss managing medical materiel in a CSH and the MMRP solution to assist in addressing medical materiel readiness issues in ARFORGEN.

Equipping Challenges

On any given day, USAMMA must balance the equipping requirements of deploying unit, reset, LBE, modernization of equipment and sets, kits, and outfits (SKO), and theater demands. The resources required to meet these equipping demands are overwhelming at best, but the Army's Title 10 responsibilities must be met. If they cannot be met, steps must be taken to mitigate the risks associated with unit materiel requirements not being fully satisfied.

During the early days of Operation Iraqi Freedom, USAMMA and Headquarters, Department of the Army (HQDA), realized that the mandate to equip all units to 100 percent was no longer viable unless millions of dollars were poured into the equipping and sustainment accounts. Not only would funding have to increase, so would the forces maintenance and sustainment programs, as demonstrated by the LBE program initiated in fiscal year 2008.

As USAMMA joined hands with AMC to assist with the LBE program, both organizations found that the



forces' equipment was not being maintained properly. In fact, USAMMA learned over a period of more than 2 years (2008 to 2010) that in 6 Active component 248-bed CSHs, approximately 50 percent of the medical equipment was not mission capable. This validated already perceived anecdotal evidence and came as no great surprise to USAMMA. It provided the facts USAMMA needed to move forward with its MMRP initiative.

Reducing Unit Equipment

Over the years, the Army Medical Department has found that attaining unit readiness upon mobilization creates many challenges. During the early days of Operation Desert Storm, medical prophylaxes medications such as the MARK I (nerve agent antidote) kit were found to be expired or missing. Similarly, medical expendable items with a shelf life and expiration date were found to be expired or not on hand upon mobilization. The Office of The Surgeon General (OTSG), along with USAMMA, made the case to HQDA in the mid-1990s to centralize the storage and maintenance of MARK I kits and expendable medical items. Generally, units were no longer required to maintain these items at home station; USAMMA would take on this responsibility.

During the early days of Operations Enduring Freedom and Iraqi Freedom, those decisions proved

to be invaluable. Not only did USAMMA deliver to the deploying units, these centralized programs saved tens of millions of dollars and allowed for rapid unit deployment. Most impressive, many of the problems that were identified from medical unit deployments for Operation Desert Shield were not repeated. Simply stated, medical centralized storage programs are efficient and effective.

The fiscal years 2008 to 2013 Program Objective Memorandum (POM), which was developed in 2006, applied lessons learned and mitigated the issues associated with unit maintenance, with the goal of equipping units to 100 percent of their modification tables of organization and equipment (MTOEs). This developed a radical paradigm shift in equipping medical units. Specifically, USAMMA focused on its most complex organization, the CSH, which includes over 1,700 medical equipment items. An Active component CSH includes an 84-bed company at the unit's location and a 164-bed company located at Sierra Army Depot, California. This paradigm included a concept to deliberately reduce unit-owned equipment while increasing use of the unit-leased concept through proven business processes, such as APS.

Along with reducing unit-owned equipment, USAMMA's concept included improving the generating force's training base locations and centrally

These containers at Sierra Army Depot, California, store an MMRP combat support hospital.



managed medical equipping programs. This concept would become one of USAMMA's key initiatives in their strategic plan—the MMRP. For many reasons, USAMMA was not permitted to include the MMRP initiative in its 2006 POM, but it was asked to further develop the concept with the Army Forces Command (FORSCOM), HQDA, OTSG, and other stakeholders.

Refining MMRP Tenets

In fiscal year 2006, USAMMA participated in a study with the Army Program Management Office Study Program Coordination Committee Working Group to further develop its MMRP initiative. This study served as the catalyst for the funding that allowed USAMMA, in concert with OTSG, to program some of USAMMA's MMRP initiative into the equipping POMs for fiscal years 2010 to 2015 and 2012 to 2017. The 2010 POM recognized the three MMRP tenets.

In 2007 and 2008, USAMMA met with a number of stakeholders to develop the MMRP concept and quickly realized the difficulty of defining the first MMRP tenet: What should be maintained at home station, and what is the purpose of this equipment (training only or training and mission support)?

Another major challenge was to establish the second tenet: What are the organizations in the medical training base, and what equipment is needed to appropriately meet the training requirements? For example, for hospitalization, USAMMA is mandated to support the Army Reserve generating force regional training sites-medical (RTSs-MED) locations at Fort Gordon, Georgia; Fort McCoy, Wisconsin; and Camp Parks, California, along with the U.S. Army Medical Command's (USAMEDCOM's) hospital training site located at Camp Bullis, Texas. Additional undocumented requirements were noted, with the largest one being the First Army, which needed equipment for validating units before mobilization. Unfortunately, for many reasons, USAMMA could not gain any traction on developing a holistic multicomponent medical training base.

Modernizing CSHs

As a bridging strategy to equip the third MMRP tenet, the Army provided approximately \$30 million for equipment and overhead costs to modernize four CSHs under OTSG's and USAMMA's control to support U.S. Army Reserve Command (USARC) hospitals. These four CSHs belong to the USARC Reserve Component Hospital Decrement (RCHD) program located at Sierra Army Depot. Essentially, USAMMA modernized 4 antiquated 248-bed CSHs within the RCHD program to the latest MTOE authorization and SKO available for any deploying CSH, regardless of component. USAMMA also partnered with Sierra Army Depot to update a large warehouse to facilitate

the maintenance, storage, and sustainment operations of these hospitals, which replicates their APS facilities and processes around the world.

The decision in 2007 to modernize four hospitals in the USARC RCHD program as the introduction to the third MMRP tenet managed by USAMMA proved invaluable because a CONUS-based CSH was directed to deploy to Afghanistan in October 2009. The deploying CSH's equipment was less than adequate from a modernization and sustainment perspective. At the unit's request, OTSG supported the use of a MMRP CSH from the medical centralized storage program for the CSH's deployment to Afghanistan. Had the MMRP CSH not been available, the deploying CSH would have required months of preparations, including inventories, maintenance services, equipment purchases, modernizations, and upgrades, before deploying to Afghanistan. Having to do this would have put the CSH's arrival date in jeopardy. This is not an indictment of the unit but an indication of the equipping model currently established for CSHs.

Merging Hospital Assets

Although it was successful in modernizing the four CSHs and the infrastructure at Sierra Army Depot, USAMMA still needed a decision on reducing unit-assigned equipment at home station—MMRP's first tenet, the CSH baseline equipment set. USAMMA's recommendation on reducing unit-assigned equipment included reexamining what was at home station and what belonged to the unit but was stored at Sierra Army Depot in the FORSCOM Hospital Optimization Standardization Program (HOSP). The HOSP was designed to take the 164-bed CSHs at FORSCOM locations and centralize them at Sierra Army Depot, using a memorandum of agreement with AMC. The memorandum of agreement between FORSCOM and AMC provided for the storage and maintenance of the units' 164-bed CSHs on a reimbursable basis, while the units maintained their 84-bed CSHs at home station.

Specifically, USAMMA recommended that the USARC RCHD and the FORSCOM HOSP assets at Sierra Army Depot be merged into one program managed by USAMMA to create efficiencies and reduce the maintenance burden on owning units. Ultimately, many felt this bridging strategy to merge the two disparate programs would provide a more responsive hospital set to deploying forces, both at home and abroad. In fact, the commander of the 18th Medical Command (MEDCOM) and the 121st CSH in Korea requested that USAMMA maintain its CSH based on USAMMA's success with similar units within the APS program located at Camp Carroll, Korea. USAMMA accepted this request, and the readiness of the 121st CSH has improved immensely. The 121st

CSH's maintenance services are now on track, dozens of equipment items have been replaced, and the unit was fully modernized in fiscal year 2010.

Addressing MMRP Concerns

During a FORSCOM CSH commanders' meeting in 2008, USAMMA briefed on the three tenets of MMRP, the merging of HOSP and RCHD, and its partnership with the 18th MEDCOM and the 121st CSH in Korea. This briefing received mixed reviews by those in attendance; however, everyone agreed that the discussion topics had to be addressed. FORSCOM leaders at the conference were opposed to reducing unit-owned assets at home station, while USARC applauded the concept. FORSCOM leaders were concerned that if they did not have adequate equipment on hand at home station, their training would suffer and their ability to respond to a local need would be challenged.

To address these issues, OTSG and USAMMA asked the RAND Corporation to study the tenets of the MMRP concept. In this study, RAND explored many of FORSCOM's concerns and USAMMA's recommendations in great detail with the stakeholders. In 2009, USAMMA and RAND representatives attended another FORSCOM CSH conference and provided an updated MMRP concept brief that was commended by most of the conference attendees. Although the details on the CSH baseline equipment set were not fully solved, the FORSCOM G-3 organization integrator and G-4 medical logistics planner agreed to explore the concept in detail. The CSH commanders unanimously agreed to merge RCHD and HOSP, but this concept still required the approval of the USAMEDCOM and FORSCOM commanders. The commanders of USAMEDCOM and the Army Medical Research and Materiel Command gave their staffs and USAMMA approval to work closely with FORSCOM to fully develop the MMRP initiative.

The Army Equipping Strategy

In September 2009, the Deputy Chief of Staff, G-8, Department of the Army, published a white paper titled "The Army Equipping Strategy," which described how the Army plans to achieve equipping balance by the end of 2011. This strategy seeks an end state in which Soldiers have the right amount and type of modernized equipment to meet their mission requirements, whether in combat, training at home station, or supporting the homeland.

Like USAMMA's MMRP initiative, the white paper states that units will be equipped to accomplish the mission. Given the realities of funding and the complexities of the CSH, USAMMA's concept to develop a standard medical baseline equipment set is critical. Units going into the ARFORGEN reset phase will be equipped to a percentage of their MTOE based on basic individual and

limited collective training requirements so they will be prepared to enter their train/ready phase.

The MMRP concept works in parallel with the Army ARFORGEN "ways model" discussed in the white paper. Once a unit receives its mission in the ARFORGEN train/ready phase, the CSH will receive the equipment required for its mission. The medical equipment for the deploying CSH could be sourced from various stockpiles, to include USAMMA's suggested medical centralized management equipment program at Sierra Army Depot (which would ultimately combine the USARC and FORSCOM CSH sets) or other sourcing programs (such as theater-provided equipment and APS). Using the "ways" to equip CSHs is very challenging but generally follows the spirit of the model discussed in the G-8 white paper.

Ultimately, the G-8 white paper discusses "friction" points in the Army's process for equipping units. "Friction" in this context refers to inadequate equipment inventories available to equip to the full Acquisition Authority Objective (AAO). In the case of a CSH, the continuous and unfunded requirements of rapid technology turnover and inadequate time to maintain hundreds of equipment items make equipping individual CSHs to the full AAO wasteful and ultimately burdensome to CSH leaders, users, and maintainers. Units rarely deploy with all of their equipment. They do not need it or have the capability to maintain it. USAMMA and RAND suggest a model that equips units initially to what is minimally needed to train and, if they have received the mission to support quick, local threats (homeland defense requirements), they would be trained accordingly.

Improving Equipment for Training

As units move through the ARFORGEN phases, the MMRP concept suggests that additional equipping be provided from various inventories as discussed earlier. To mitigate the training risks associated with less than full AAO equipping, USAMMA would increase the priority placed on equipping the generating force medical training sites, such as the RTSs-MED managed by the USARC but available to both Active and USARC units. These locations would receive adequate modernized materiel and SKOs to meet large-scale collective training requirements not available at home station. This model works very well with USARC CSHs because they train at the RTSs-MED during their annual training and only maintain a small amount of equipment at home station.

In many cases, Active component CSHs train at the RTSs-MED as well, based on the expertise and capabilities of the RTSs-MED staffs. Other efficiencies the USAMMA CSH equipping model provides are transparency and asset visibility of centrally managed medical equipment sets, based on the day-to-day



A combat support hospital employed in Iraq.

control and management USAMMA would provide, similar to the APS program USAMMA manages along with AMC.

The LBE process that USAMMA conducts with AMC has revealed that 50 percent of medical equipment in CSHs was not fully mission capable. The equipping white paper insists that units must find ways to foster more effective stewardship of unit-owned equipment. USAMMA fully supports this with one caveat: Realistically, the volumes of CSH medical equipment (this includes over 1,700 medical equipment items and thousands of supplies and pharmaceutical items) and technologies are overwhelming. Granted, the CSHs could improve their sustainment programs, but without additional training to address the complexities of the equipment assigned to a CSH and more medical equipment repairers assigned to a CSH, unit readiness will always be less than acceptable.

USAMMA suggests that the basis-of-issue plans be reduced early in the ARFORGEN process and prudent equipment decisions be made as a CSH receives its mission in the ARFORGEN train/ready pool. Under the MMRP model, unit leaders would have more time to focus on actual training and not the burdensome maintenance tasks associated with the large quantities of medical equipment items.

The suggestions of the MMRP concept and its tenets as they relate to equipping CSHs are an obvious paradigm shift and require the reexamination of decades-old equipping programs and policies. Leaders must open themselves to the “Army owned, unit leased” equipping concept. The Army must also reconsider how basis-of-issue plans are applied and how

units report readiness as part of their monthly unit status reports. Many would argue that USAMMA’s suggested equipping strategy for a CSH involves many risks; however, a better argument would suggest that failure to explore USAMMA’s MMRP equipment strategy is even riskier. With the lessons learned by the LBE program and the decision to deploy a CSH to Afghanistan, the MMRP concept fosters a more available, less costly, and less burdensome equipping solution for our units.

The Army should consider the suggested USAMMA MMRP equipping strategy for CSHs because the current ways of equipping the Army’s CSHs are struggling. CSHs deserve smaller onhand equipment inventories. They need only the technologies and equipment items minimally required for training, with the understanding that the medical generating force training locations will be equipped to mitigate any risks from reduced equipment at home station. Finally, as the CSH receives a mission, USAMMA must have medical SKOs available to meet unit mission requirements as they progress through the ARFORGEN phases. Once the USAMMA MMRP model is vetted and demonstrates its value to a CSH’s readiness, it could be applied to other medical units and beyond.

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THE VIEWS EXPRESSED IN THIS ARTICLE ARE THOSE OF THE AUTHOR AND MAY NOT BE ENDORSED BY THE U.S. ARMY.

Cold-Chain Management and the Use of TempTale Technology

BY COLONEL MITCHELL E. BREW, MAJOR MICHAEL RONN, AND PETTY OFFICER FIRST CLASS SUMMER WEBB, USN

Shipping class VIII (medical materiel) supplies overseas can be a tricky operation. Sending them overseas and requiring that they be maintained at the right temperature throughout the journey is an even greater challenge. Trying to get temperature-controlled shipments of class VIII to Iraq, Afghanistan, or the Horn of Africa in the dead of summer is the greatest challenge of all.

At the U.S. Army Medical Materiel Center, Europe (USAMMCE), the Distribution and Transportation Division (D&T) receives, repackages, and ships hundreds of thousands of refrigerated items per year, including vaccines, pharmaceuticals, and laboratory and imaging reagents. Refrigerated packages range from as small as an office telephone to as large as a Xerox printer. Specific guidelines dictate how each package is to be packed, depending on the estimated outside temperature that the package will be subjected to and the amount of time the package is likely to be in transit.

Each package is loaded with a TempTale RF [radio frequency] monitor. (The monitor is produced by

Sensitech, a business unit of Carrier Corporation.) These monitors, which are slightly smaller than a deck of cards, periodically record the temperature inside the package. When a product arrives at its final destination, the recipient is able to see if the temperature inside the package has remained within the temperature range set for refrigerated items. If a package arrives “out of range,” the information is sent to USAMMCE’s Clinical Advisory Division (CAD) whose clinical staff determines whether or not the product is still viable for use. The process is highly effective and has become a mechanism for confidently managing the cold-chain continuity required to successfully ship temperature-controlled items.

With hundreds of TempTale monitors travelling to destinations throughout the world, a system had to be developed that would comprehensively track and record the readings and disposition of each temperature-controlled package that was shipped from a USAMMCE dock. Leaders from D&T and CAD met with USAMMCE’s website designer and laid out the requirements for a TempTale Monitor Control system. In short order, the designer produced a comprehensive program that was introduced to USAMMCE.

The TempTale Monitor Control system is a Microsoft Access-based program that allows USAMMCE to monitor, track, and provide clinical disposition on all cold-chain material received by and shipped from the USAMMCE distribution center. The main menu of the database is divided into three sections: the receiving section, refrigeration section, and CAD. Though each section’s portal contains different data, they interact to provide an overall picture of the shipping and storage temperature of temperature-managed material while en route to and from USAMMCE facilities.

The ability to monitor a transportation or supply vendor’s and USAMMCE’s cold-chain management success rate is now only a mouse-click away. This capability allows D&T to track the amount of temperature-controlled packaging material it needs to maintain the



TempTale is a monitor used to record the temperature of cold-chain supplies as they travel to their customer. Once the supplies arrive at their destination, the customer can determine if the proper temperature was maintained throughout the trip. The device is distributed by Sensitech, a business unit of Carrier Corporation.

proper environment and to adjust packaging for future shipments to similar areas with similar weather conditions. The TempTale Monitor Control system provides USAMMCE with the capability to anticipate packaging needs by learning from the historical data collected and empowers it to further benefit its customers.

When asked about the importance of ensuring that temperature-controlled items arrive within the correct temperature range at their destination, Lieutenant Colonel John Bailey, USAMMCE's D&T chief, stated, "USAMMCE ships over 25,000 pounds of cold-chain medical products and vaccines annually that must be delivered to our customers within 72 hours. For refrigerated and frozen medical products, it is imperative that our packing and shipping protocols are followed exactly to ensure our customers are receiving viable products. USAMMCE has always been on the forefront of developing cold-chain packing protocols."

The TempTale Monitor Control system provides a mechanism to measure and report temperature data to ensure that packaging protocols are effective. As medical materiel advances in sophistication, it often requires greater environmental control, and the importance of accurately tracking, recording, and processing data for temperature-sensitive items continues to

The TempTale Monitor Control system is a Microsoft Access-based program that manages the radio frequency data gleaned from TempTale monitors. These data are analyzed to ensure the safety of cold-chain medical materiel.



Employees at the U.S. Army Medical Materiel Center, Europe, re-ice and box up H1N1 vaccine for shipment to the U.S. Central Command. Delivering pharmaceutical supplies requires cold-chain management to monitor the temperature of sensitive medical materiel.

increase. The TempTale Monitor Control system is essential to managing this logistics requirement.

Future updates and added features will continue to keep this system operating as a dynamic resource that adds a new component to the transport of temperature-controlled medical materiel. It gives the user confidence that the product has been packaged, shipped, and received in an environment that meets the strict requirements of the manufacturer so that the product can be used to help the fighting force downrange and beneficiaries serving overseas.

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The Ordnance Schools' Move to Fort Lee

BY GAYLE A. OLSZYK

The Chief of Ordnance and Commanding General of the Army Ordnance Center and Schools, Brigadier General Lynn A. Collyar, and the Regimental Command Sergeant Major, Command Sergeant Major Daniel Eubanks, presided over the casing of the regimental colors at the original Home of Ordnance at Aberdeen Proving Ground, Maryland, at the conclusion of the Ordnance Week activities in May 2009. This final ceremony was fittingly conducted in front of the Ordnance Headquarters, affectionately known as “the Stones.” In September 2009, the unfurling ceremony was held in conjunction with the 9/11 memorial service at Fort Lee, Virginia, not only establishing the new Home of Ordnance but also calling attention to, and reflecting on, our fallen Ordnance Soldiers.

Many articles have been written about the state-of-the-art facilities on the new Ordnance campus. This article focuses on the people and organizations, especially the school base closure and realignment (BRAC) teams, that for the past 5 years have been designing, building, equipping, and moving to make the new Ordnance School campus a reality.

Preparing to Move to Fort Lee

The Ordnance Center and Schools began preparing for the move to Fort Lee after the BRAC Commission

announced its congressionally mandated decisions in May 2005. The commission directed that the Ordnance Mechanical Maintenance School at Aberdeen Proving Ground and the Ordnance Munitions and Electronic Maintenance School at Redstone Arsenal, Alabama, consolidate into one Ordnance School and merge at Fort Lee by 15 September 2011.

When the move was announced, Major General Vincent Boles was the Chief of Ordnance. Under his direction, each school quickly organized teams to implement the BRAC directive. The BRAC teams responded to hundreds of design details and requests for information; designed and populated equipment spreadsheets; designed room data sheets detailing end-user requirements from square footage to audio-visual details; and managed equipment inventories, movements, and deliveries. While they continued to train Soldiers, instructors developed course movement strategies based on the Army Training and Doctrine Command (TRADOC) mandate that schools continue to train their annual loads.

In addition to the school teams, Major General Boles assigned me to lead the Ordnance “torch party,” which started with one person but over time grew with the assignment of several warrant officers, noncommissioned officers, and contractors. The torch party worked at Fort Lee, teaming with Norfolk

This aerial photo shows the north range at Fort Lee, where recovery training and ammunition training will be conducted. (Photo by Albert Cruz, BRAC Construction Office)



District Corps of Engineers representatives, Army Combined Arms Support Command (CASCOM) BRAC construction and synchronization teams, Fort Lee garrison staff, TRADOC and Assistant Chief of Staff for Installation Management BRAC representatives, and seven construction companies. Much of our success can be attributed to the endless hours of dedicated effort, constant and frequent communication, and attention to details of these teams that all worked with the goal of representing end-user requirements and ensuring the new facilities meet Ordnance Corps missions for the next 50 years.

In 2006, with no manuals in hand on how to execute BRAC, the newly arrived Chief of Ordnance, Brigadier General Rebecca S. Halstead, directed me to build a strategy around lines of operation. These lines of operation—construction, funding, personnel, transportation, and equipment—continue as the areas we track and brief to the Ordnance School leaders during monthly BRAC in-process reviews.

In 2006, the focus was on the “charrette” process. During these meetings, representatives from every organization imaginable, including utilities, fire departments, force protection, environmental, the National Park Service, information technology, architects, engineers, and end users, met to translate and validate user requirements into individual building designs and a campus with more than 20 facilities. While looking at the day in the life of a Soldier and standardizing classrooms and bay structures, we compiled lessons learned that quickly became the foundations of the charrettes that followed our work through the design reviews. From these charrettes, architecture and engineering firms produced requests for proposals, architectural



Brigadier General Lynn A. Collyar and Command Sergeant Major Daniel Eubanks case the Ordnance Center and School colors at the original Home of Ordnance at Aberdeen Proving Ground, Maryland, in May 2009.

renderings, and floor plans, giving us the first glimpse of the buildings, the schools, and the future.

Preparing for Construction

In the early summer of 2007, trees were felled as the infrastructure, utilities, and road grids began taking shape on the 300-acre campus. In November, Colonel Michael T. McBride, Ordnance Center chief of staff, planted the regimental flag, establishing the Ordnance Center’s presence at Fort Lee. During this same period, the BRAC teams, working with the Corps of Engineers and Colonel Edward Gully, special assistant to the CASCOM commander on BRAC, began the contract award process. The first contract was awarded for the Tactical Support Equipment Department (TSED) facility, the first three of six barracks, and the battalion and brigade headquarters.

The next award was for the second largest dining facility in the Army, with a capacity to feed 3,600 Soldiers in 90 minutes, followed by the award of the north range vehicle-recovery range facilities and five welding and training classroom-and-bay facilities. Construction awards continued through 2010. As of May 2010, the only remaining awards were for the explosive ordnance disposal range and classroom complex, the climate-controlled storage facility, the chapel, and the fitness center.



At left: In September 2009, the Ordnance Center and School commanding general and command sergeant major unfurled the Ordnance Center and School colors at the Sustainment Center of Excellence headquarters at Fort Lee. (Photo by Julianne E. Cochran, Army Sustainment)



Above: The new Army Ordnance School has 15 training facilities, like these, with training bays. (Photo by Albert Cruz, BRAC Construction Office)



At Right: In 2007, Army Ordnance Center and School staff planted the Ordnance Center and School flag to establish the Ordnance Center's presence at Fort Lee. (Photo by Gayle Olszyk)





An M1A2 Abrams tank arrives at the Ordnance School at Fort Lee, where it will be used to train ordnance Soldiers to maintain this weapon system. (Photo by Albert Cruz, BRAC Construction Office)

The campus landscape continued to change as construction companies established their presence with temporary office structures and lay-down areas for their construction equipment and building materials. Soon after construction was underway, the BRAC teams re-engaged with reviews and awards of furnishing and equipment packages.

Beginning Instruction at the New Campus

In June 2009, the TSED facility was the first building to reach its building occupancy date. This presented new challenges to the BRAC teams, which had only 90 days to furnish and equip the building for training according to school-developed course move schedules. The outcome was a thumbs-up for all as the TSED training started in August, right on schedule. Since then, we have continued to refine our occupancy process. On 6 July 2010, training began in the five central campus phase-1 buildings, with Soldiers being housed in barracks two and three.

From the start, the BRAC staffs at both Aberdeen and Redstone have been involved in accurately identifying requirements, design, contract reviews, equipment movements, and establishing new procedures for the consolidated Ordnance School.

Special thanks must go to the military and civilian team assigned to the school—those who changed duty location and jobs and even those who retired in lieu of moving to Fort Lee. Throughout these years, with BRAC as an additional duty, the Ordnance School cadre and instructors have demonstrated true professionalism by continuing to remain engaged throughout the lengthy process and working to ensure the facilities supported the desired end state.

Saving the best for last, I would be remiss without offering a very special thanks to Colonel Dan Reilly, commander of the 61st Ordnance Brigade and Ordnance Mechanical Maintenance School, who for the past 2 years has been the right leader to execute the first moves, establishing the brigade presence for command and control and the first training department. His leadership and management skills, as well as his can-do attitude, are clearly the reasons why the training at the new Ordnance School continues on schedule.

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Coblenz 1919: The Army's First Sustainment Center of Excellence

BY ALEXANDER F. BARNES

In October 2009, the Army Combined Arms Support Command at Fort Lee, Virginia, was designated as the Sustainment Center of Excellence (SCoE), bringing together all aspects of the Ordnance, Transportation, and Quartermaster Corps and their associated doctrine, concepts, and training. Although this is an interesting concept, it is hardly original. In 1919, in Coblenz, Germany, and the surrounding areas, the U.S. Third Army, out of necessity, developed a complete multifunctional sustainment operation. It not only supported a large U.S. combat force but also found creative ways to train its Soldiers, commonly known as “doughboys,” in logistics operations.

Everyone in the Army today is aware of the long-standing deployment of U.S. military forces to Germany. Since the end of World War II in 1945, U.S.

Army and Air Force personnel and their families have worked, traveled, and lived in Germany. What most people do not realize is that from December 1918 to January 1923, another U.S. occupation force was in Germany, and its little-known story is equally as compelling as the story of the post-World War II force.

World War I Armistice

The armistice of 11 November 1918 was not actually the end of World War I; it was merely a truce that allowed the peace negotiations needed to end the war to take place. Though victorious, the U.S., British, French, and Belgian armies were not allowed to rest in place.

The terms of the armistice were clear and fairly precise. Condition V of the armistice agreement of 11 November 1918 stated, “The areas of the left bank of

the Rhine shall be administered by the local authorities, under the control of the occupation troops of the Allies and the United States Armies of Occupation.” This meant that the American Expeditionary Forces (AEF), commanded by General John J. Pershing, still had work to do. General Pershing knew that he had to build the U.S. portion of the occupying force from the forces under his command and that this force would have a mission unlike current combat operations.

Granted, this mission was one they had all been waiting for because its assignment signified the end of the fighting. It also meant, however, that the doughboys in selected units would be staying in Europe while their buddies went home.

Third Army Established

Deciding that, because of operational constraints, it would not be

Soldiers prepare bread in the 90th Division's quartermaster bakery in Bernkastel, Germany, in January 1919. (Photo courtesy of the Army Military History Institute at Carlisle Barracks, Pennsylvania)



possible to use either the First or Second Army as the army of occupation, Pershing had another option. With the rapid influx of doughboys from the United States to the frontlines in France, plans had been made before the armistice to organize a third Army. On 14 November 1918, this army was designated as the Third Army with Major General Joseph T. Dickman as commander and became known as the Army of Occupation. Today's Third Army shoulder patch, with its symbolic A inside an O, reflects that heritage.

To structure the new army, Pershing chose the 1st Division, the 2d Division (which had one brigade of Marines and one of Soldiers), the 3d Division, and the 4th Division from his Active Army units. From the Army National Guard, he selected the 42d Division and the 32d Division. From his National Army divisions, he added the 89th Division and the 90th Division. [The National Army was a volunteer Army (almost analogous to today's Army Reserve) that was established in 1917 and disbanded in 1920.] All together, these eight divisions would make up the main combat strength of the Third Army. (Most readers will be more familiar with these units as infantry divisions, such as the 1st Infantry Division, but during the period in question, the Army had only infantry divisions; therefore, they were called the 1st Division, 2d Division, and so forth.)

Pershing later added the 5th Division and the 33d Division to secure the line of communication that would run from France through Luxembourg and into Germany. He also included a number of pioneer infantry regiments, corps support units, truck companies, and aviation units to round out his force. [Pioneer infantry regiments performed a number of valuable tasks, such as equipment recovery and salvage operations. They also did engineer-type work, such as road repair.]

In total, Pershing sent over 250,000 doughboys into a 2,500-square-mile section of Germany inhabited by slightly less than a million Germans. He also deployed almost 50,000 of his troops to Luxembourg. Sending a force of this size into a relatively small area had serious implications for Third Army logisticians.

Third Army's Mission

The Third Army's mission was quite complex and evolving. The first phase required the selected units to leave their positions in the Meuse-Argonne area of France, move by road through Luxembourg, cross the German border on 1 December 1918, and take control of the Rhine River bridges in the designated U.S. occupation sector of Germany. For some units, this meant a 300-kilometer hike to the occupation sites. The bridges in question included a pontoon bridge and a railroad bridge at Coblenz and the railroad bridges at Engers and Remagen. The Third Army had to maintain secure access to all of these bridges on both sides of the Rhine.

The British Army to the north and the French Army to the south had similar missions and their own bridges to seize and guard. The Belgian Army, farthest north of the Allied Armies, occupied the area around Aachen, Germany, but did not have a bridgehead across the Rhine.

The second phase of the operation was to use the occupation sectors as administration zones for accepting and processing the war materiel (guns, machineguns, aircraft, and vehicles) that Germany was required by the armistice to hand over to the Allies. The delivery of this materiel was a major project that was not completed until late in the summer of 1919. After all materiel was delivered, the mission focus was ensuring that Germany provided the Allies with the financial reparations required by the armistice and subsequent treaties.

The Allies were keenly aware that the German Army had moved across these same bridges en route to their starting points for the invasion of Belgium and France in 1914. Should peace negotiations break down, the Allies could use these strongly defended bridgeheads across the Rhine to quickly move their forces into the heart of Germany and continue the war.

All this was in the future, though, because Pershing first had to get his troops to their occupation sites on both sides of the Rhine River.

March From France

The long march through the rain and mud of a European winter from France through Luxembourg to Germany was a difficult one. Most of Pershing's divisions had come straight out of combat and were in serious need of refurbishing and resupply. The Army of 1918 still depended heavily on draft animals for transportation, and they had suffered as much as the Soldiers had in the October to November campaign in the Argonne Forest.

Third Army logisticians had less than 2 weeks to prepare the selected units for the move to Germany. However, the logisticians were given the authority to take whatever was available from non-Third Army units to make up equipment shortages for the deploying units. Keeping in mind that many of the troops were still wearing the same single combat uniform in which they had started the campaign, the size of the task was daunting.

Fortunately, toward the end of the war, the U.S. Services of Supply had made some improvements in its ability to supply the frontline Soldier with what he needed. Nonetheless, as the 250,000 doughboys crossed the German border on 1 December and headed to the Rhine, their equipment and physical condition still left much to be desired. Not only were boots, rifles, gas masks, artillery pieces, signal carts, and kitchen trailers worn out, at least 90 percent of the troops were infested with lice. Spanish flu and mumps epidemics also wreaked havoc on individual Soldiers.

To make matters worse, Pershing's Soldiers were headed into enemy territory that promised little in the way of food, supplies, or medical treatment. Germany had been blockaded for 4 years, and the inhabitants of the areas to be occupied did not have enough food and medicine for themselves, much less for an occupying force. Sustaining the force was going to require creativity, and it was going to have to be fast.

Sustaining the Troops

The initial plan for logistics support to the Third Army had called for moving supplies and equipment by road and rail from the depots in France through Luxembourg and then into Germany. However, the French rail system had been thoroughly worn out during the war and required significant repair. France desperately needed the available rolling stock to get its industrial base back on a peacetime footing. Therefore, the French Government asked the AEF to consider another means of moving supplies to the occupation zone.

This request meant that shortly after arriving in the occupation zone, the Third Army had to completely redo its logistics support plan. After a short study, the Army decided to bring what it could by truck from the AEF depots in France and to have the bulk of their supplies shipped from the United States to either Antwerp, Belgium, or Rotterdam, The Netherlands. From these ports, the cargo would be loaded onto river barges and towed down to the Rhine riverports in to the U.S. occupation zone. Bendorf, Germany, on the right bank of the river, was used to support the 1st, 2d, and 32d Divisions.

Andernach and Coblenz-Lützel on the left bank of the Rhine were selected to support the other units. In time, large ration dumps were established at Andernach and Bendorf and a quartermaster depot was set up at Coblenz-Lützel. All of these depot sites were chosen not only for their proximity to the Rhine for receiving the inbound cargo but also for the nearby road junctions and railheads that allowed easy onward movement to the troop sites.

Army logisticians also looked around to see what was available locally to support the force. Working in the Third Army's favor was the fact that the area around Coblenz had been a hub of support to the German Army, so with a little innovation, some logistics functions could get a fast start. The logisticians first had to work their way through the great piles of abandoned German war materiel still in the area. In one warehouse, they found 140,000 blankets, which they placed on barges and shipped up the Rhine to Rotterdam for use by refugees in war-torn Belgium. Bales of cloth for making German Army uniforms were found in a Coblenz factory and sent back to France to help make and repair the uniforms of the thousands of German prisoners of war being held there.

Among the facilities found in Lützel, a town on the north side of the Mosel River, across from Coblenz, was a complete shoe and uniform manufacturing plant. Owned by the German Government and previously a major supplier of uniforms and shoes for the German Army, the plant was well laid out and equipped with electrically powered machines. Operating the facility, Third Army quartermasters repaired 13,348 pairs of shoes in January and February 1919. By mid-February, the daily output was between 800 and 1,000 pairs.

After the long, muddy march to the Rhine, the Third Army moved quickly to provide laundry services to the U.S. forces in the occupation zone. The Army took over several German laundries to wash and clean the troops' uniforms. Army mobile laundry units that had made the march soon joined in to augment this desperately needed service. A large German laundry with six washing machines was located close to the Lützel shoe factory, so it was also appropriated. As the Third Army later reported on the operation, "By the middle of February an output of 30,000 pieces a day was being maintained with a force of 45 German civilians working in two shifts, and the system was working so well that laundry received in the morning was washed, repaired and ironed by night." The salary for each of these German employees was paid for by the German Government as part of the cost of occupation.

Ammunition Stores

During the first days of the occupation, in addition to salvaging German military equipment and monitoring the war reparation efforts, the Third Army logisticians had another equally important, and potentially more dangerous, mission. When the Third Army Soldiers arrived in their designated occupation zone, they found large quantities of ammunition that had been left behind by the German troops when they evacuated Rhineland-Pfalz. Most of this ammunition was found at Trier; Neuwied; Mülheim (near Coblenz), where the Germans had maintained a plant for assembling ammunition of various calibers; and at the old 19th-century forts surrounding Coblenz.

The stocks included German ammunition and ammunition that had been captured from the Allied armies. They found shells of every caliber and large numbers of fuses, aerial bombs, grenades, empty shell cases, and small-arms ammunition. They also found large quantities of gunpowder, zinc, lead, and brass used in the manufacture of ammunition. Much of the ammunition was unserviceable and too dangerous to justify continued storage or shipment to the United States.

Third Army ordnance specialists quickly demilitarized or dismantled the dangerous materials. They were able to salvage some of the munitions for future use, experimentation, and static displays and managed to recover 135,000 artillery shells, 400,000

fuses for artillery shells, more than 22 million rounds of small-arms and rifle ammunition, 3,000 heavy artillery brass cartridge casings, 36,000 naval shells, and 2,000 tons of German gunpowder. Much of this ammunition was later used in annual Army of Occupation wargames that took place each autumn and involved large numbers of live-fire exercises.

While the Third Army was working to solve many logistics issues locally, the distribution pipeline coming from the United States slowly started to move materiel. Supplies for the doughboys were first towed down the river on 23 March 1919 and continued to arrive at an average rate of 1,216 tons per week at Andernach and 1,912 tons per week at Bendorf. The new depot at Coblenz-Lützel received 977 tons of quartermaster stores to be maintained as the Third Army's stocks. In a very short time, the Rhine River, control of which was the main reason for the Army to be in Germany, had become its support lifeline.

Meeting Other Soldier Needs

The need for some of these supplies was critical. The lice infestation of approximately 90 percent of the doughboys had to be addressed. Once the troops were in their billets in their assigned divisions' sectors, the medics started a massive campaign to delouse the troops and free the command of vermin.

At first, only one truck-mounted steam sterilizing machine was available and the bathing facilities in the smaller towns were inadequate. In response, the Third Army medics and mechanics worked together to build several steam-powered disinfecting machines. With this equipment and some standard steam disinfectors and portable shower-baths that arrived in the zone, the lice menace was rapidly reduced. By 31 May 1919, the lice infestation rate was down to less than 1 percent.

The Third Army also began a program of schools to train the doughboys in military and civilian subjects. Soon there were unit-level and division-level schools in a number of locations. The 33d Division, still in Luxembourg, even found time to send all of its cooks and mess personnel back to class for refresher training in mess hall operations.

American Forces in Germany

In July 1919, the Third Army furled its flag and was replaced by the American Forces in Germany (AFG). Major General Henry T. Allen, the AFG commander, was a firm believer in both field training and classroom training, and under his guidance, the school systems flourished even more. He established a regimen in which class attendance was expected, rather than just encouraged.

The school system soon included a Mechanical School featuring formal instruction in automobile and



The Army authorized unit shoulder patches just before the World War I armistice. In this example from the occupation, a doughboy has sewn a small Third Army patch into the center of his 4th Division patch. After General Allen assumed command, only the Third Army patch was authorized for wear by Soldiers in Coblenz. (Photo courtesy of Alison Hutton)

motorcycle repair, blacksmithing, welding, and driving. The Quartermaster's School taught cooking, baking, and shoe repair. The Ordnance School focused on weapon and general equipment repair at the company or battery level. The Signal Corps and Engineer Corps also ran schools that taught everything from radio operation and repair to mapmaking and mechanical drafting. Even the AFG's "provisional" cavalry squadron ran a school to teach stable operations and saddle repair.

The crown jewel of the Army school system was a small farm that the AFG quartermasters set up near Mülheim. Used as a teaching laboratory for agricultural sciences, it provided classes on such topics as animal husbandry, gardening, and general agriculture. Using student labor, the farm provided fresh meat, vegetables, eggs, milk, and flowers for the Soldiers and dependent families of AFG. Because of the scarcity of good milk in the U.S. zone, the farm became the source for all the milk used for patients in the local Army hospitals. The quartermaster farm also provided milk for the children of U.S. servicemen assigned to AFG.

AFG Drawdown

In the United States, the 1920s were starting to “roar,” and with the post-war economic boom and the growing sense of isolationism, no one really cared much about the German Rhineland. The U.S. congressional enthusiasm to maintain a force on the Rhine dwindled with time, causing the size of the AFG to shrink as the occupation ran its course.

With the continued drawdown, every month brought more sales of excess equipment no longer needed by the AFG. All AFG aviation activities shut down in April 1922, and all aviation equipment, including 24 DeHavilland DH-4 aircraft, several brandnew Liberty engines, and other spare parts at the airfield near Weissenthurm, was sold. Also included in the auction were all of the gardening tools and livestock that the Air Service doughboys had accumulated to supplement their diet and as a pastime for their off-duty hours at the airfield.

In January 1923, with its strength down to 1,000 men, the AFG received orders to fold its flag and return home. Faithful to the very end to the cause of innovation and self-sufficiency, all materiel that could not be carried away was disposed of through local auctions and sales. Even the AFG’s unofficial newspaper, supported completely by local subscriptions and advertising, sold off all its office equipment and donated the proceeds to buy milk for the children of poor German families in Coblenz.

By February 1923, all of the U.S. forces were gone and the French Army had moved into Coblenz to maintain the occupation. Who could have known then that the U.S. Army would return in force again to this part of Germany in March 1945? The capture of the Ludendorff

Railroad Bridge at Remagen, the very same bridge once proudly guarded by the Soldiers and Marines of the 2d Division after World War I, would signal that the end of World War II in Europe was near and the second occupation of Germany would soon begin.

In retrospect, there is a lot to be admired about the Army’s “first sustainment center of excellence” at Coblenz. Though they would not recognize that name, the logisticians of the Third Army and AFG certainly earned the title. Providing support under unusual conditions in a foreign land, they showed a creative streak that ensured that the United States had a viable force to meet a varied mission. While doing so, those logisticians also managed to run a variety of school and training sites that prepared the doughboys not only to be better Soldiers but also, in many cases, prepared them for civilian occupations after their service was complete.

Whether supporting the 250,000 men of the Third Army in 1918 or the last 1,000 doughboys of the AFG in 1923, the assigned logisticians certainly earned a place of honor as part of the first U.S. “watch on the Rhine.” General Pershing put it more simply: They were part of “the best unit in the Army.”

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Combined Arms Support Command (CASCOM), is for the officer to think of himself first and foremost as a multifunctional logistician. To quote General Stevenson, who is now the Deputy Chief of Staff, G-4, Department of the Army (DA), “Otherwise, why would we have bothered to go through all of what we went through?”

The challenge is that we also have an obligation as a unified corps to nourish and sustain our individual areas of functional expertise. Future division transportation officers, chiefs of the Office of the Quartermaster General, and chiefs of ordnance have to be developed.

Logistics officers are strongly encouraged to read DA Pamphlet 600-3, Commissioned Officer Professional Development and Career Management, and become acquainted with recent updates, including an expanded list of key developmental positions for majors and an updated career path chart. If officers have further ques-

tions, they should talk to their sustainment chain of command, human resources managers, or the chief of the Logistics Branch Proponency office at CASCOM.

The bottom line is that as an LG officer, one must be ready to do it all—fight, support, and survive. The LG officer must be both a functional expert and completely familiar with multifunctional sustainment. If it were easy, they would not call it logistics.

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Collaborative Management Will Improve Weapon System Sustainment

BY RICK CONLIN AND JIM MCINTOSH

The environment in which weapon system sustainment takes place is changing fundamentally. The authors believe these changes will require the Department of Defense and industry to transform the way they do business.

The UH-60 Black Hawk helicopter is familiar to the American public, but few outside the U.S. Government have thought much about what it costs. Sikorsky Aircraft Corporation sells the Black Hawk to the Army at an average cost of approximately \$14 million (including platform procurement and initial spares). The fleet currently consists of about 1,800 Black Hawks, each with an average lifespan of 25 years. During every year of its life, a Black Hawk requires about \$800,000 of repair and spare parts purchases. These purchases fall into the category of sustainment.

While attention is typically focused on the initial cost of procuring a weapon system, sustainment spending actually accounts for most of the total lifetime cost of ownership. Sustainment is critical from a mission and readiness perspective. When sustainment is optimized, weapon systems perform better, spend less time under repair, and remain in use longer, thus delaying the need for their replacement. For every additional year that a helicopter remains in use, the Army saves over \$4 million.

At a time of defense cost-cutting, acquisition transformation, and emphasis on responsible use of taxpayer dollars, a bipartisan perception has grown that the Federal procurement system has problems buying and maintaining big-ticket weapon systems from the aerospace and defense industry. The current way of doing business in the weapon systems market is primed for a major overhaul. Given that the Department of Defense (DOD) budgets 60 percent more for operation and maintenance than for procurement, the United States faces an opportunity to improve how it acquires weapon system sustainment.

This article outlines a major paradigm shift toward a more collaborative management approach: aligning logistics and acquisition activity among the military services, the Defense Logistics Agency (DLA), and private industry. In the ideal future state, DOD would bridge the gap between supply chain and procurement management through a disciplined operational strategy of collaborative management. This strategy would include collaboration

within both individual and joint weapon system portfolios, providing seamless integration of supply chain management (including sourcing) by the services, DLA, and industry.

A New Environment Calls for Change

Weapon system sustainment today fails to take advantage of opportunities for generating efficiencies and savings. Legacy practices have prevented DOD from optimizing lifecycle costs. The services buy individually from the same suppliers and, in some cases, purchase identical systems, parts, and services.

Furthermore, the separation of supply chain and acquisition activities means that total system portfolio costs are hard to capture. Key decisions are made in isolation, resulting in significant sustainment cost and readiness impacts that should have been addressed in acquisition. The services also have been unable to partner effectively with industry to ensure top-notch service.

Weapon system sustainment is currently undergoing rapid change. While several efforts are underway to improve sustainment throughout DOD, the environment surrounding sustainment is rapidly and fundamentally changing. In order to make lasting improvements, we must first understand these changes and their implications.

An Emphasis on Precision Over Brute Force

The DOD mission is shifting from brute force to persistent precision. DOD's mission continues to evolve from the Cold War garrison model to one that can conduct the Global War on Terrorism with a smaller, more precise, more responsive, and more persistent footprint. DOD forces and their supporting supply chains must be able to deploy, reconstitute, and redeploy on a moment's notice. Weapon systems must be able to move and maintain readiness in this rapid-fire environment. These demands leave little room for process inefficiencies, especially those that affect supply chain performance, by either DOD or its sustainment providers in industry.

Internal DOD Changes Affect Sustainment

The approach to sustainment reflects internal DOD changes. Just as DOD's mission has shifted, the fundamental approach to sustainment sourcing has adapted to key changes within DOD, including base closure and realignment (BRAC), DLA's evolving role, and several Office of the Secretary of Defense (OSD)-led initiatives.

BRAC legislation has forced DOD to further rethink the management of inventory and supply chains. DOD is changing the current distribution channels for parts, commercializing significant pieces of the defense supply chain, and bringing DLA into organic depot operations. One particularly important DOD imperative deals with logistics—in particular, sustainment sourcing with commercial providers. This current BRAC imperative has raised concern among the services that sustainment sourcing will have an effect on overall mission performance. When sustainment sourcing is done well, commercial logistics offerings properly align with DOD products, services, assets, and capabilities. When sustainment is done poorly, it hampers DOD's quick-strike capability.

DLA, in coordination with the U.S. Transportation Command (TRANSCOM), OSD, and the services, has been a vocal leader in the transition to an enterprise supply chain. DLA has implemented many strategic sourcing initiatives that relate directly to weapon system sustainment. The agency created multifunctional strategic sourcing material groups within its eight cross-service supply chains (aviation, land, maritime, construction and equipment, clothing and textile, medical, subsistence, and energy).

This expanded DLA role has produced a broader sourcing portfolio that includes class IX (repair parts) and cross-service partnering in tire acquisition (among the Army, Navy, and Air Force), the Industrial Prime Vendor program, and the Fleet Automotive Support Initiative. However, there is still room for significant improvement not only within DLA but also throughout DOD.

The transition to thinking jointly across DOD is still far from complete. The services and defense logistics providers understand the clear need for a joint supply chain approach. They know that they use many common parts, components, subsystems, platforms, and repair capabilities and have integrated some low-level areas of common supply. However, the major weapon systems and platforms present a significant challenge. The services fear that indiscriminate leveraging will overlook the unique service and product needs of complex weapon systems or platforms, and they maintain a strong desire to retain ownership of sustainment.

To move forward comfortably, the services must feel confident that a weapon system sustainment portfolio has clearly articulated business and performance requirements *tailored to their own needs*

that can be forwarded to industry, bid on, and executed. However, at this point the services recognize that they do not fully understand what is unique about their requirements versus what elements are common to all the services. It is absolutely essential that the services be able to communicate what differentiates their own major weapon systems. Otherwise, they cannot make educated decisions on what to keep in house and what to share.

Hidden Ownership Costs

Separating supply chain and acquisition activities hides total ownership costs. Historically, inventory procurement, commercial repair, and organic repair for weapon systems have been contracted separately, subject to the uncoordinated involvement of program management officers, line-item managers, and contracting officers. As a result, it is difficult to understand and quantify the portfolio of spare parts and repair requirements for a given national stock number. This challenge has become more profound with the expanding role of DLA. More importantly, this complexity translates into limited visibility of purchasing across these activities, a tremendous potential for redundancy within an enterprise portfolio, and lost opportunities to leverage buying power to reduce costs.

Industry Partnerships Are Evolving

Industry partnerships, while an important element of DOD's transformation, are also key elements of the underlying challenge of sustaining weapon systems. While many approaches have been tried with varying degrees of success, the best model for these partnerships has yet to be defined. Over the past several years, the number of industry partnerships has increased dramatically; DOD repair depots alone have 348. Although the nature of the agreements has also evolved as partnerships have become broader and more complex in scope, depot partnerships are still primarily focused on blue-collar activities and have not encouraged substantial investment from the industrial base.

Using Performance-Based Agreements

Use of performance-based logistics (PBL) agreements is growing. A particularly successful form of industry partnership, PBL is a sustainment support strategy that aligns incentives for logistics performance with the desired outcomes for weapon system performance. While PBL has been implemented successfully with industrial suppliers, DOD is exploring opportunities to apply it within the organic repair community.

PBL agreements usually include some level of baseline, award, or penalty payments associated with prenegotiated supply chain or weapon system performance metrics, such as on-time delivery, materiel availability, or system uptime. More importantly, PBL

agreements create incentives for sustainment providers to continuously improve their logistics efficiency and performance, resulting in improved weapon system performance at lower support costs.

The most progressive (or inclusive) PBLs outsource significant elements of the DOD weapon system supply chain, such as distribution, maintenance, and inventory management or ownership. The least progressive PBLs simply outsource a single function, such as distribution or supply.

DOD's experience with PBLs has shown that certain performance-based approaches are more appropriate in specific situations. Platform-level programs, such as the Air Force's C-17 transport, align all aspects of sustainment to the overall goal of platform readiness. However, common subsystems, such as auxiliary power units and aircraft engines, are used jointly and across platforms. In those cases, the key performance objective is simply the availability of the subsystem. Similarly, commodity parts providers have entered into PBL agreements focused primarily on parts availability and delivery performance. The PBL contract for Navy aircraft tires is a leading example of a commodity-level PBL agreement.

The critical factor for PBL effectiveness is balancing the amount of risk that DOD will transfer to an industry partner against the amount of financial liability that the industry partner is willing to accept. Failure to achieve this balance translates into inadequate and costly supply chain performance or financial damage to the company entering into the PBL. These arrangements must be "win-win" scenarios that deliver required performance at acceptable cost to the Government and ensure that the commercial partner can meet the performance requirement profitably.

With experience, DOD is getting better at drafting PBL agreements. In recent PBL programs and second-generation negotiations, DOD is asking industry to determine the costs of their contracted performance levels. DOD is also asking industry to meet performance targets by making repairs rather than purchasing excessive inventory. This approach reduces the Government's level of inventory ownership and risk. Some programs have transferred a significant portion of inventory ownership to industry providers, encouraging industry to balance investments in inventory with investments in optimal inventory planning, system design, and component quality. Such investments lead to lower overall costs, a smaller logistics footprint, and greater reliability.

DLA is becoming a larger player in weapon system sustainment and industry partnerships with major tier-1 vendors. DLA has long managed the acquisition of consumables. Its expansion into managing contracts for depot-level reparable has forced program management offices (which maintain logistics and supply chain requirements) to coordinate their sustainment buying requirements with both service-owned and

DLA contracting offices as well as industrial suppliers. Now that industry has shifted toward complex contractual sustainment relationships (which include spares, repair, and other supply chain outsourcing elements), suppliers, DLA, and DOD are now integral sustainment players and partners.

In recent years, a number of PBL agreements, many of which deal only with parts distribution and are applicable across platforms, have been transitioned from the services to DLA. The services tend to keep a tighter grasp on more progressive weapon system agreements. In fact, PBL inclusiveness is the de facto boundary line for deciding which contracts are transitioned to DLA management. This practice has led to "inclusiveness inflation." Some large weapon system sustainment contracts have become unnecessarily inclusive, with the result that the services retain control of many sustainment functions. The downside is lost opportunities to benefit from cross-service and cross-platform supply chain management.

The Future: Collaborative Management

Against a background of fragmented processes and solo organizations, weapon system sustainment will evolve toward a tightly managed, integrated supply chain. It should be governed under joint management that seamlessly integrates the services, DOD logistics providers such as DLA and TRANSCOM, and industry. The sustainment portfolio must be tightly controlled by the services' program management offices.

At the tactical level, contracting officers must be able to translate logistics requirements into contracts with commercial vendors that deliver top supply chain and cost performance across the entire portfolio. Contracting officers therefore must fully understand all aspects of a system's sustainment portfolio. Business requirements must be appropriately drafted, negotiated, executed, and managed by a cohesive DOD contracting team. Finally, industry and Government must establish win-win relationships for logistics and contract management and for supporting a dynamic and demanding customer base.

Currently, the Government has begun integrating the primary players, but that integration is far from finished. DLA must cement the boundaries of sustainment control in the face of considerable uncertainty. Should DLA own PBL agreements? Should DLA be in the repair business? Substantial work by logistics and acquisition personnel will be needed to hammer out the best contractual relationship between cost and performance. The services and DLA must first build an effective integrated relationship and then work with industry to form a well-functioning team.

By fully adopting the following competencies and practices, DOD and its suppliers can dramatically transform the way they interact and collaboratively manage their relationships.

Use End-to-End Supply Chain Management

Before spending money on weapon system sustainment, particularly in a fixed-price environment, the Government must first understand exactly what the end-to-end supply chain is expected to do and how it should perform. Each system's supply chain is unique, as are its performance metrics. Once DOD identifies the appropriate performance categories, it can then determine the optimal levels of performance.

For example, if DOD decides that system uptime is critical, the next question is how much uptime is optimal. This process involves combining a deep understanding of the system supply chain with benchmarked analytics for the chosen metrics that carefully balance performance and cost.

Articulate Unique Sustainment Requirements

Once weapon system performance outcomes are set, they must be translated into unique sustainment requirements. Program management offices must carefully state sustainment requirements to contracting officers so they can appropriately bid and award the work. Program management offices need to know not only what performance levels are required but also how those levels can be achieved.

For example, system uptime can be achieved through repair turnaround or inventory procurement. A clearly articulated business requirement would prescribe uptime levels and specify how the contractor must achieve that metric. An example would be, "I want to achieve 95-percent uptime by maintaining no more than 75 inventory days of supply and no more than a 7-day repair turnaround time on critical items."

Engage Customers

DLA and the services have already defined the distinctive supply chains and begun integration across their customers. To achieve optimally structured supply chains, they must engage customers in collaborating to eliminate stovepipe thinking. Despite DOD's mandate to drive integration, the different services and even individual commands can present obstacles. Driving change requires convincing DOD clients of the need for change and of DOD's competence to lead that change. A key element of change management will be listening closely to fully understand the customers' perspectives and then demonstrating that the proposed strategies will address their needs and concerns.

Model Lifecycle Costs

DOD's ability to model lifecycle costs should help convince customers of the need to change. Typically, customers simply cannot see all elements of the supply chain across DOD, and their decisions solely reflect their own interests. With its analytical capabilities and view of the *entire* supply chain, DOD can bring a holistic, fact-based perspective to the conversation. The

services and DLA have already transitioned from measuring cost to measuring service. The logical next step involves understanding the strategic tradeoffs between cost and service based on rigorous analysis.

Make the Most of What Is in Hand

A weapon system's end-to-end supply chain contains millions of dollars' worth of inventory. Whether these spare parts inventories are at the depot or forward-deployed in the field, they contain the pieces and parts that often dictate how fast a downed system will be ready to use again. Historically, DOD has relied on mountains of inventory to maintain readiness. With increased interest in cost reduction and the leaner and more precise mission requirements of today's wars, DOD must sustain its systems with less inventory.

Program managers will ultimately have to rely heavily on repair to replenish depleted inventory. They will also need to understand exactly where in the supply chain repair decisions must be made. Industry, which may own progressively larger parts of sustainment supply chains, must be equally savvy. The more vendors deliver contracted performance levels through repairing rather than purchasing, the better their bottom-line margins will look.

Build Industry Partnerships

DOD's shift from managing inventories internally to relying more broadly on industry has laid the foundation for the next shift: a balanced partnership with industry. While the Japanese model of supplier partnerships can remove untold waste, DOD must build partnerships that balance a commitment to cooperative relationships with a commitment to competitive pricing.

Many commercial organizations have found themselves relying on "partner suppliers," only to discover that the supplier was capturing most of the value from the relationship. Emerging disciplines within DOD, such as supplier relationship management (SRM), help to alleviate these concerns. Under the SRM framework, industry best practices, such as demand forecasting, asset visibility, and total lifecycle management, are integrated seamlessly within DOD partners. These types of partnerships are built to evolve over time and create long-term value for both parties.

Differentiate Supplier Relationships

Building on the foundation of the strategic supplier alliances and the Supply Chain Alliance model should result in a broader array of differentiated relationships. By looking at needs holistically, the services and DLA can create the most advantageous supplier relationships rather than focusing on the largest DOD suppliers.

In some cases, the original equipment manufacturer will take on a larger role in managing the total supply

chain from development to sustainment and even disposal of a weapon system. But in other cases, the supply chain will be broken down into its parts and roles assigned along different dimensions, such as geography or activity. These differentiated roles will help to clarify priorities and accountabilities.

Maximize Leverage With Suppliers

The role of industry will only grow larger in future weapon system sustainment. DOD will repeatedly buy from the same primary vendors for both repair and spares (particularly for joint weapon systems). This massive level of spending can be leveraged for maximum cost discounts and performance levels when contracts are awarded in combination with multiservice and interservice buys. With streamlined, multifunctional contracts for multiservice or interservice programs, vendors can streamline inventory, distribution, and repair capacity.

Maximize Organic Capability

BRAC is already reconfiguring organic capability and capacity. DOD's organic capacity throughout the country is shifting dramatically through the closing of some depots and the expansion of others. DOD must perform a balancing act by selecting industrial suppliers while maintaining its own production and repair capacities in accordance with Title 10 (which mandates a 50-50 commercial-to-organic workload). In this realignment, it is important to understand what capabilities should be preserved in house and what should be contracted. Collectively, the portfolio of depot work should make maximum use of depot capabilities.

Reduce Redundancy

With so much spending being distributed among both commercial vendors and depots, the potential for capability redundancy is significant. While some redundancy ensures bandwidth and scalability when demand is high, too much redundancy can create major cost and performance inefficiencies. The Government often double-buys: It pays industry to perform work or buy inventory, but it continues to act as well. DOD should reduce redundancy while maximizing its organic capability.

The Benefits of Collaborative Management

A glimpse into the future shows numerous benefits from collaborative management. No longer will essential knowledge and business requirements for a purchase get lost in transition between functions. Contracting centers of excellence will provide best practices and intellectual capital to help contracting officers create more advantageous contracts. A better management philosophy will alleviate inefficiencies and make the process easier by automatically

building the most critical supply chain business and performance requirements into best-in-class, lifecycle-focused contracts.

Furthermore, these contractual agreements will relieve overtaxed Government resources of the burden of intensive cost and performance management. Management will place skilled people where they are required and make full use of their expertise. This is not to say that roles will remain static: Today's roles may call for additional skills, and new roles may well be instituted. The vision is one of smoothly meshing gears among partners within and outside Government.

Although instilling the discipline and required competencies of collaborative management into weapon system sustainment is a long-term process, DOD is beginning the journey. Program management offices, including that of the Black Hawk helicopter, are already building the foundation for collaborative management. As the Black Hawk program management office rationalizes its vendor base, it is also establishing more progressive competencies outlined in this article: formalized SRM programs with strategic vendors, progressive performance-based contract development, collaborative depot partnerships between the Government and industry, and continued coordination with DLA, OSD, and the services in the design of a joint supply chain architecture. Much work remains to be done. Nonetheless, Black Hawk sustainment is among many examples that show that DOD recognizes the importance of weapon system sustainment and the collaborative management practices that optimize it.

The future state of weapon system sustainment will ultimately depend on how the progression toward collaboration continues. Collaborative management in sustainment will emerge through careful planning and execution grounded in rigorous due diligence and tactical discipline, often on a platform-by-platform or system-by-system basis. Though the process may lack drama, the future state seems worth the effort. It will one day close the gap among acquisition, logistics, and commercial industry leaders so that all parties can work together to support the warfighter in a combat environment that is demanding, dynamic, and historically unique.

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Small-Arms Ammunition Production and Acquisition: Too Many Eggs in One Basket?

BY MAJOR MARK W. SIEKMAN, USAR,
DR. DAVID A. ANDERSON, AND ALLAN S. BOYCE

The United States continues to conduct operations in two major theaters while simultaneously engaging in contingency operations around the world and training the remaining, undeployed forces for subsequent operations. In light of this challenging environment, President George W. Bush in 2007 requested and received an authorization from Congress to increase the Army by approximately 75,000 Soldiers.¹ This growth, coupled with the continued high operating tempo of the operational force, requires additional resources. At the heart of these increasing requirements are small-arms munitions.

This paper examines the United States' small-arms ammunition acquisition strategy for meeting the Army's current operational and training requirements, as well as for the increase in the future force structure. It compares the current operational requirements for small-arms ammunition with present production capabilities and limitations in order to determine if the defense industrial base needs to make changes to the acquisition strategy.

Lake City: Production and Sources

The acquisition strategy for small-arms ammunition is based on the Government-owned, contractor-operated (GOCO) ammunition plant at Lake City, Missouri. Alliant Techsystems, Inc. (ATK), operates this GOCO facility for the Government. As a GOCO, the facility is commanded by an Army lieutenant colonel, but ATK is responsible for production operations and output capabilities. This relationship allows the Government to reduce its manpower costs and invite private-sector business initiatives to promote efficiency and improve production.²

Over 99 percent of all small-arms bullets (5.56-millimeter [mm], 7.62-mm and .50-caliber) consumed by the Army under its Title 10 responsibility to supply and equip its forces are manufactured at the Lake City Army Ammunition Plant. Production demand is driven by current operational requirements; any production shortfalls at Lake City are outsourced to private companies within the United States.³ Logisticians will argue that this strategy lacks adequate redundancy and responsiveness, especially when one considers that the Lake City facility was built in 1941.

The Army's small-arms ammunition production is affected by more than the output of the Lake City facility. As with any manufacturing system, the supply chain is an integral piece in the production output process. Each small-arms-ammunition cartridge (single round) contains several components. The main ammunition used by virtually every Soldier and Marine is the 5.56-mm cartridge. Its design includes the cartridge case, the bullet or shot, propellant, and primer. Each of these components is fabricated from different commodities. The Army requires ATK to maintain a minimum of three suppliers for each of the components.⁴

The lead and steel for the bullet's penetrator are obtained from sources located in the United States.⁵ The brass for the cartridge case is primarily supplied from companies within the continental United States (CONUS). Lake City purchases brass in the form of brass case cups and bullet jacket cups from a U.S.-based source. During the manufacturing process, these cups are pulled from their original configuration and reconfigured into the appropriate small-arms ammunition

¹ *Grow The Army*, Department of the Army, Washington, DC, 2007, www.army.mil/growthearmy, accessed 4 May 2009.

² *Ibid.*

³ Richard G. Palaschak, Director of Operations for the Munitions Industrial Base Task Force, before the House Armed Services Subcommittee on Tactical Air and Land Forces, 24 June 2004.

⁴ *Ibid.*

⁵ *Ibid.*

Levels of production by the Lake City Army Ammunition Plant in Missouri.

Note that the Army almost doubled its total requirements for small-arms ammunition from 2003 to 2004.

(Source: Thomas Blose, *Production Base Realities*, Briefing, Joint Munitions Command, Picatinny Arsenal, New Jersey, 13 February 2002.)

cartridge type. Alternative suppliers have been identified; however, they account for less than 5 percent of the total purchased.⁶ Lake City has taken the initiative to recycle unused and waste brass during the manufacturing process to reduce costs.

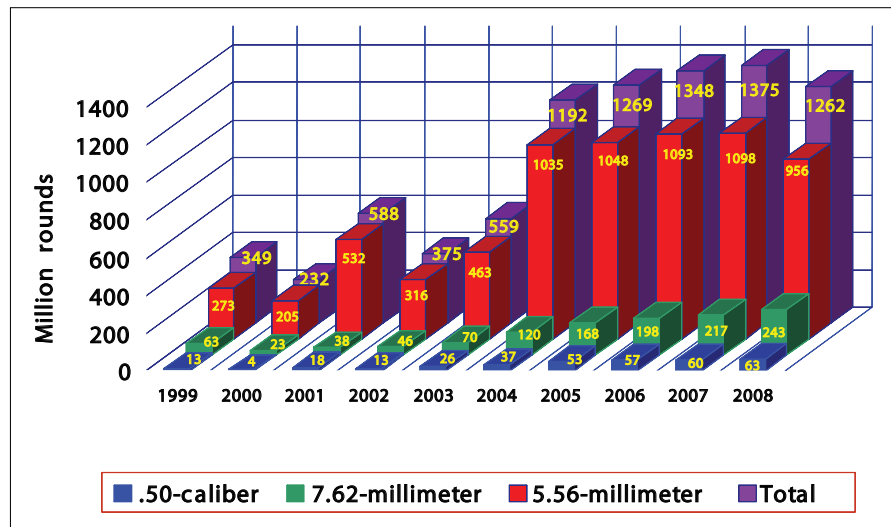
The main ingredient used in all small-arms ammunition propellants is nitrocellulose. The Radford Army Ammunition Plant in Virginia is the sole producer of this essential ingredient for all propellants used throughout the Army's ammunition industrial base. Radford has an acid-concentrator facility that produces the nitric and sulphuric acids that, when combined with cellulose, make nitrocellulose. Ninety-nine percent of all small-arms ammunition used in Afghanistan and Iraq contains nitrocellulose produced at this facility.

Finally, the primer in most cartridges is made from over 13 different chemicals, which are mixed at the Lake City plant. Lake City manufactures the primers for all small-arms ammunition produced at its facility. ATK continues to seek additional sources of supply for the primer mix chemicals. All suppliers are based in the United States. However, the U.S. suppliers obtain these chemicals from Canada, Europe, Mexico, India, Brazil, and China as well as the United States.⁷

One final component unique to machinegun ammunition is linkage belts. Before Operation Iraqi Freedom, Lake City relied on suppliers for linkage belts using 5.56-mm, 7.62-mm, and .50-caliber ammunition. Because of the large increase in demand for this ammunition, the plant invested in upgrading its facilities and manufacturing equipment. This included purchasing, moving, and installing the sole surviving production line for linkage belts for 5.56-mm, 7.62-mm, and .50-caliber machineguns.

Production Capabilities and Requirements

The chart above shows the levels of production by the Lake City Army Ammunition Plant over the last decade. The Army almost doubled its total requirements for small-arms ammunition from 2003 to 2004. The resulting increase in Lake City's production requirements caused



ATK and the Army to initiate a modernization and process improvement program to increase efficiency and production capabilities.⁸

Initially, the need for greater output was addressed by increasing the operating hours of the plant and adding another work shift for production. ATK now uses a process improvement management technique modeled after what the Toyota Corporation uses.⁹ Despite the current modernization and process improvement efforts by the Army and ATK, the plant's production capability is physically limited to 1.6 billion small-arms ammunition rounds annually.¹⁰

Three Scenarios for Analysis

Can the defense industrial base support small-arms ammunition production for current and future operations, as well as the increase in the Army's force structure? In order to answer this question, we applied gap analysis to the Army's small-arms ammunition requirements and its production capabilities.

We first identified the total requirements for small-arms ammunition as determined by the Joint Munitions Command. The requirements depicted represent a range of three existing and possible situations. Next, the current defense industrial base's small-arms ammunition production capability was compared to the differing situational requirements. Finally, the Lake City Army Ammunition Plant's supply chain was analyzed to determine potential points of failure and possible shortfalls. The interpretation and implications of these results are offered at the end of this article.

The chart on page 62 summarizes the total small-arms ammunition required by the Army for the three existing and possible situations. The first situation represents requirements for peacetime operations and training occur-

⁶ Ibid.

⁷ Ibid.

⁸ Lieutenant Colonel Christopher Day, Lake City Army Ammunition Plant commander. Briefing to author during Lake City tours, May and October 2009.

⁹ Ibid.

¹⁰ Ibid.

Ammunition Type	Pre-11 September 2001 Annual Requirements	Fiscal Year 2005 Annual Requirements	World War II Annual Requirements
5.56-millimeter	626.2 million rounds	1.353 billion rounds	n/a
7.62-millimeter linked	47.2 million rounds	282 million rounds	n/a
.50-caliber linked	20.4 million rounds	74 million rounds	n/a
Total	693.8 million rounds	1.709 billion rounds	21.6 billion rounds

This chart shows the total small-arms ammunition required by the Army for three existing and possible situations: for peacetime operations and training after the Cold War and before the terrorist attacks of 11 September 2001, during fiscal year 2005, and during the “total war” scenario of World War II. (Source: Created by authors based on data from Alliant Techsystems Purchasing Department, Lake City Army Ammunition Plant, Missouri.)

ring after the end of the Cold War and before the terrorist attacks of 11 September 2001. This time period reflects a force structure similar to today’s Army, but during a period in which no major combat operations occurred.

The second situation is fiscal year 2005, which represents requirements based on the “1–4–2–1 force sizing construct” and the “simultaneity stack” developed as part of the Total Army Analysis (TAA). The TAA is a biennial process that determines the forces needed to execute the national strategy based on higher-level planning guidance like the Quadrennial Defense Review. Under the 1–4–2–1 force-sizing construct, the United States plans to defend the Nation (“1”); maintain forces that can fight in four critical regions (“4”); maintain the ability to defeat opponents in two regions simultaneously (“2”); and decisively win one of those conflicts at the U.S. initiative (“1”).

The 1–4–2–1 force-sizing construct produced a simultaneity stack (resourcing priorities) in six major categories: homeland security, deter aggression, major combat operations, small-scale contingencies (non-critical), transformation, and generating force structure.¹¹

Fiscal year 2005 was selected for two reasons. First, we believe it provides a valid representation of current, and likely future, operations since fiscal year 2005 required the most small-arms ammunition under the current force-sizing construct. Second, current small-arms ammunition requirements could not be released by the Joint Munitions Command because of their sensitivity. This baseline is also predicated on the assumption that Army requirements for two major combat operations will remain constant despite the announced drawdown of forces in Iraq.

The third situation selected is the small-arms ammunition requirements during World War II.

The total requirements for small-arms ammunition represented by these three time periods clearly reflect the

types of operations occurring at each time. The first time period, pre-11 September 2001, reflects the “peace dividend” brought about by the end of the Cold War and the reduction in forces following the Gulf War. U.S. military leaders and policymakers clearly believed in a smaller, more technologically advanced force that could end conflicts rapidly. The requirement for the production of large amounts of small-arms ammunition no longer seemed to be great.

However, the simultaneous operations in Afghanistan and Iraq, classified in the force-sizing construct as two simultaneous major combat operations, changed the requirements for ammunition. Although the data do not reflect the use of each type of small-arms ammunition, much of it was used in training before deployments to Afghanistan and Iraq. So fiscal year 2005 was used to represent the highest annual requirement under the current force-sizing construct.

We chose to represent data from World War II to highlight worst-case scenario requirements. These data represent total mobilization of the force during war. Although this “black swan”¹² is not necessarily probable based on the current threat picture, we believe it is valid to compare its demands against small-arms ammunition production capabilities.

Sources of Supply

The production capability represented only accounts for the sole GOCO facility at the Lake City Army Ammunition Plant. It does not represent outside contracted sources of production. These contracted sources account for approximately 300 million rounds annually. The Joint Munitions Command has awarded contracts to General Dynamics Ordnance and Tactical Systems as the second source supplier.¹³ General Dynamics Ordnance and Tactical

¹¹ *Total Army Analysis (TAA) Primer 2009*, Army Force Management School, Fort Belvoir, VA, www.afms1.belvoir.army.mil/pages/primers/TAAPrimer24April2009.pdf, accessed 16 December 2009.

¹² The term “black swan” represents a worst-case scenario in which the President of the United States authorizes total mobilization of the military, include mobilization of the industrial base.

¹³ Laurie VanBrocklin, *General Dynamics Awarded Small Arms Ammunition Contract*, www.pressmediawire.com/article/Investor_Relations/Contracts/General_Dynamics_Awarded_109_Million_by_US_Army_for_SmallCaliber_Ammunition/18371, accessed 22 October 2009.

Systems has procured contracts through various sources, including Olin Corporation's Winchester Division.

Before the current contract, the Joint Munitions Command had acquired small-arms ammunition from foreign sources, such as Israel Military Industries Ltd., for similar amounts in 2005.¹⁴ Members of the acquisition community, along with ATK, are actively pursuing a strategy involving 100-percent contracted sources for small-arms ammunition.¹⁵ This was reinforced when the Deputy Secretary of Defense ordered that "to the maximum extent feasible, [the Army will] transition Government-owned ammunition production assets to the private sector."¹⁶

The Lake City Army Ammunition Plant is currently operating at maximum production capacity and cannot significantly increase munitions production, even after the current modernization effort ends in fiscal year 2011. The chart below depicts, by ammunition type, Lake City's total production capability.

Lake City cannot significantly increase its production of an ammunition type by refitting another ammunition type's production line. For example, the plant cannot shut down the 7.62-mm production line, reconfigure it to produce 5.56-mm ammunition, and then produce 230 million additional 5.56-mm rounds. The only option to significantly increasing small-arms ammunition production at Lake City would be to construct additional facilities and production lines.¹⁷ However, no current or future plans exist to construct additional facilities at Lake City, or anywhere else for that matter.

We also analyzed Lake City's supply chain for each small-arms ammunition cartridge type. Each component uses the same key commodities, but different sources of supply are used for each of these commodities for each cartridge type. The chart on page 64 depicts each key input commodity involved in manufacturing the cartridge components and the sources of supply used by ATK at Lake City.

Each small-arms ammunition type uses brass for the cartridge casing. ATK purchases over 95 percent of its casing brass from the Olin Brass Company in the form of brass case cups and bullet jacket cups. This purchase is a fixed-price, fixed-time agreement. Olin Brass also supplies U.S.-based commercial

ammunition manufacturers with brass sheet metal for cartridge casings.¹⁸ During the fiscal year 2005 production surge, Olin Brass met the increased demands without causing any disruption of small-arms ammunition production at Lake City.

ATK also purchases the brass for two cartridge types from ND PressTec GmbH, which is located in Germany. Another alternate supplier for brass is Luvata Buffalo, Inc., in New York. ATK recently solicited Luvata for a 4-year proposal, but Luvata did not bid.¹⁹ Research on this commodity did not find any issues with supplying ATK with the materiel needed to produce the case component for each small-arms ammunition cartridge type.

ATK identifies St. Marks Powder, Inc., as the primary source of supply for the propellant used in each type of small-arms ammunition. Based in Crawfordville, Florida, this division of General Dynamics Ordnance and Tactical Systems is the single source of propellant for Lake City. ATK continues to seek alternative suppliers, but it has yet to find a qualified sourcing candidate because of U.S. Government risk mitigation policies and production quality and quantity standards.

Research data on propellant did reveal an issue with one of the key commodities and its source of supply. This commodity is nitrocellulose, and it is found in every propellant and explosive used by the U.S. military, from small-arms ammunition to bombs. As noted before, the only manufacturer capable of producing the quantity and quality of nitrocellulose required by the military is the Radford Army Ammunition Plant in Virginia. Radford is constructing a new acid concentrator and nitrocellulose facility in 2011 to 2013 to replace the existing facility, which was built in 1941.²⁰ The new facility will not expand the production capacity for nitrocellulose.

The next key commodity for each cartridge is the lead used in manufacturing the bullet. ATK identifies two suppliers of lead, both of which are located in CONUS. The primary supplier uses a proprietary technique to extract lead from used vehicle batteries and then reformulates it to be sold. The lead is purchased in ingots

The total production capability of Lake City Army Ammunition Plant by ammunition type. (Source: Created by authors based on data from Alliant Techsystems Purchasing Department, Lake City Army Ammunition Plant, Missouri.)

Ammunition Type	Total Annual Requirements (Fiscal Year 2005)	Maximum Government-Owned Contractor-Operated Annual Production
5.56-millimeter	1.353 billion rounds	1.2 billion rounds
7.62-millimeter linked	282 million rounds	230 million rounds
.50-caliber linked	74 million rounds	85 million rounds
Total	1.709 billion rounds	1.515 billion rounds

¹⁴ Andrew Buncombe, *The Independent*, 2005, www.commondreams.org/headlines/05/0925-02.htm, accessed 21 October 2009.

¹⁵ Day.

¹⁶ Department of Defense Directive 5160.65, Single Manager for Conventional Ammunition (SMCA), 1 August 2008, p. 4.

¹⁷ Day.

¹⁸ Larry Smith, Lake City Army Ammunition Plant purchasing manager (ATK). Briefing to author during Lake City tour, October 2009.

¹⁹ Ibid.

²⁰ Justine Barati, "Radford Looks to New Plant," www.army.mil/-news/2009/01/22/15990-radford-looks-to-new-plant, accessed 4 September 2009.

Component Commodity	Primary Source of Supply	Alternate Source wof Supply	Alternate Source of Supply
Casing brass	Olin Brass	ND PressTec	Luvata Buffalo
Propellant	St. Marks Powder	n/a	n/a
Bullet lead	Metalico-Granite City	Gopher Resource Corporation	Exide Technologies
Bullet steel penetrator	Michigan Rod Products	G.G. Greene	n/a
Primer	Alliant Techsystems	n/a	n/a
Primer mix	There are 17 chemicals involved in the primer mix, all of which have different suppliers.		

The key commodities involved in manufacturing cartridge components and the sources of supply used by ATK at Lake City Army Ammunition Plant.
(Source: Created by authors based on data from Alliant Techsystems Purchasing Department, Lake City Army Ammunition Plant, Missouri.)

An adversarial relationship may very well become a reality in light of the growing protectionist policies enacted by Congress. Recently, a minor trade disagreement between the United States and China began over an increase in the tariff on tires imported from China.²³ Although this measure by the Office of the United States Trade Representative was meant to protect the U.S.

that are configured at Lake City for each cartridge. No supply issues exist in the purchasing of lead for the bullet cartridge component.

Another key commodity for the bullet is the steel penetrator for each cartridge type. ATK has identified three primary U.S. sources of supply for this key commodity. These suppliers acquire steel from various locations around the world. This particular commodity does not present a supply issue for Lake City. However, ATK has identified other sources of supply for the steel penetrator if needed.²¹

The final key commodities in manufacturing cartridges are the primer and the primer mix. All small-arms ammunition manufactured at the Lake City Army Ammunition Plant receives primers from an on-site manufacturing facility. Over 40 ATK facilities can provide primers to the Lake City plant.

The chart on page 65 identifies the primer mix chemicals, the suppliers to ATK, and the country of origin. All 13 chemicals for primer mix are formulated by U.S.-based commercial companies, but 10 chemicals have origins outside of the United States. Of these 10 identified chemicals, 4 have origins solely in China, 2 others are only found in Mexico, and 1 is only found in Brazil. Three other chemicals share origins among the United States, European countries, India, China, and Mexico.

Despite the chemicals having origins outside of CONUS, ATK has not identified any of these chemicals as presenting a supply problem for the formulator.²² However, we find potential issues with the countries of origin for some of the identified chemicals. These potential issues are primarily political in nature. Although trade agreements do exist with China, India, and Brazil, these countries may become trade adversaries in the future.

tire industry, it pushed China to reciprocate tariff action. Furthermore, obtaining the chemicals found in Mexico may become problematic as the government of Mexico struggles with native indigenous groups, drug cartels, and disillusioned citizens.

Challenges and Vulnerabilities

So, can the defense industrial base support small-arms ammunition production for current and future operations as well as an increase in the Army's force structure? The answer to this question is, yes. However, the small-arms ammunition requirements for the Army exceed the capacity of production at the Lake City Army Ammunition Plant. Government-owned capacity was lost through the systematic deactivation of munitions plants that began shortly after World War II. Although a modernization program has been implemented at Lake City, it will not increase the plant's production capacity enough to meet Army requirements, leaving the United States vulnerable to a "black swan" total-war type of scenario. And this does not even account for the Marine Corps' ammunition requirements met by Lake City.

Shortfalls in production capability have forced the Joint Munitions Command to award additional sourcing contracts to General Dynamics Ordnance and Tactical Systems. Despite the efforts of the command, Lake City and the contract with General Dynamics Ordnance and Tactical Systems will not be sufficient to deliver enough small-arms ammunition to meet a worst-case total war scenario. If total war were to occur, the United States would be vulnerable if it had to depend on foreign sources to make up the total munitions shortfall.

The research on ATK's supply chain operations at Lake City shows a strong and stable supply of most

²¹ Ibid.

²² Ibid.

²³ Douglas A. McIntyre, "US Imposes Big Tariffs on Chinese Tires, Beijing," *Daily Finance*, 12 September 2009, www.dailyfinance.com/story/us-imposes-big-tariffs-on-chinese-tires/19159125, accessed 2 November 2009.

Chemical	Supplier	Country of Origin
Barium nitrate	Barium and Chemicals	China
Calcium silicide	Perkins Rouge	Brazil
Magnesium oxide	Matrixchem	Mexico
Calcium resinate-fused	Barium and Chemicals	United States/China/ Europe/India
Potassium perchlorate	Hummel Crouton	China
Strontium nitrate	Barium and Chemicals	China
Strontium oxalate	Barium and Chemicals	United States/China/ Europe/India
Strontium peroxide	Hummel Crouton	Mexico/ United States
Magnesium aluminum alloy	Reade Manufacturing	United States
Calcium resinate-peripiated	Hummel Crouton	Mexico
Magnesium carbonate	Matrixchem	United States
Barium nitrate	Barium and Chemicals	China
Ammonium nitrate	Dyno Nobel	United States

The primer mix chemicals, the suppliers of those chemicals to ATK, and the country of origin of the chemicals. All 13 chemicals for primer mix are for mulated by U.S.-based commercial companies, but 10 chemicals are imported from outside of the United States (Source: Created by authors based on data from Alliant Techsystems Purchasing De part ment, Lake City Army Ammunition Plant, Missouri.)

commodities needed for the manufacturing of each type of small-arms ammunition. However, a few key cartridge commodities have sourcing vulnerabilities. Sole-source providers of necessary chemical materials from countries such as China, India, and Mexico may prove problematic. The small-arms ammunition supply chain does not have alternatives for these key chemicals. Any disruption of supply, whether induced by economics, politics, or physical dislocations, would have a significant adverse effect on the ability of Lake City to produce small-arms ammunition.

The defense industrial base must prepare for a possible disruption in the supply chain by either stockpiling

the identified key chemicals or by designing a cartridge that does not rely on chemicals found outside the United States. ATK should also require its suppliers to identify their total dedicated demand-surge capacity. This would indicate in advance the potential bottlenecks to Lake City reaching its full production capability.

Of further concern is the fact that all ammunition roads lead through the Radford Army Ammunition Plant because it is the sole Government-grade producer of nitrocellulose. Although modernization programs will supplant the aging facility currently used there, the Army and its sister services cannot afford to lose this plant's ability to produce nitrocellulose.

In a paper he delivered in 2009 at the Defense Acquisition University, Colonel John Ferrari focused on reversing the trend toward privatization based on historical private-sector behavior in declining industries.²⁴ He argued that the munitions industrial base fits the definition of a declining industry in that revenues have declined by almost 80 percent and more than 70 percent of the companies disappeared from 1985 through 2001.²⁵ Although revenues have temporarily grown because of current operations, this increase is only temporary. Since this declining industry is subject to national policy that blocks overseas outsourcing, the military's total reliance on the private sector is highly problematic and dangerous.²⁶

We believe that the current ammunition production and acquisition strategy has placed too many "eggs into one basket." The defense industrial base must enhance its own production and supply chain capacity in order to circumvent foreign dependence and ensure against any production degradation at Lake City. Only by taking these steps will the Army ensure that it can provide all the required ammunition to warfighters now and in the future.

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²⁴ Colonel John Ferrari, "Transferring Conventional Munitions Industrial Base Capabilities to the Public Sector," Defense Acquisition University, 2009.

²⁵ Ibid.

²⁶ Ibid.

Sustainment Symposium Highlights Changes to Army Supply Strategies and Priorities

The Association of the United States Army, Institute of Land Warfare, held its Army Sustainment Symposium and Exposition from 22 to 24 June at the Greater Richmond Convention Center in Richmond, Virginia. This year's event came in the midst of the drawdown of troops and equipment in Iraq and the buildup of resources in Afghanistan. Sustainment leaders high-lighted the impact these changes are having on Army sustainment.

Lieutenant General Mitchell H. Stevenson, Deputy Chief of Staff, G-4, Department of the Army, noted areas where the sustainment community is struggling—specifically property accountability and asset visibility. General Stevenson said that because the Army has been so busy, key accountability concepts have been shoved aside.

Asset visibility is another issue, especially with new equipment. General Stevenson noted that, in Afghanistan, 1,700 mine-resistant ambush-protected all-terrain vehicles have been issued, but only 1,020 have been recorded in the Standard Army Maintenance System (SAMS). The G-4 is hoping that upcoming changes to the Global Combat Support System-Army will

improve management by transferring property book data directly into SAMS.

The G-4 also noted that the Army is working on modifying Logistics Civil Augmentation Program (LOGCAP) policy. LOGCAP has cost the Army approximately \$37 billion since 2001. "In the course of those last 9 years, we have learned a lot of lessons," said the G-4. "That ought to translate itself into our policy."

General Ann E. Dunwoody, commanding general of the Army Materiel Command (AMC), said that General Raymond T. Ordieno, commander of U.S. Forces-Iraq, was complimentary of the "Log Nation" and "its incredible mission of drawing down" an Army that has been in Iraq for nearly 8 years. General Dunwoody noted that the work of logisticians has "enabled and allowed him [General Ordieno] to meet the Presidential mandate" to drawdown to 50,000 troops by September 2010.

"It is a busy time for our Army," said General Dunwoody. "[These] next couple of years [are] going to be equally, if not more, challenging." Part of the challenge is the buildup in Afghanistan, which received 40 percent of its surge equipment out of Iraq. "That is pretty incredible if you think back to Desert Storm/Desert Shield, with the iron mountains where we did not know where everything was," said General Dunwoody. "Now we have asset visibility to see the stuff that is in Iraq, move it to Afghanistan, which means we are not going to ship it again, we are not going to buy it again, and we have been able to support the surge."

General Dunwoody praised the resilience of the sustainment force for also serving in humanitarian assistance missions during this time. "We were able to set up contracting and LOGCAP within 72 hours of arrival," she noted of Operation Unified Response in Haiti. "The entire 'Log Nation' strategic partners helped sort out and provide relief and then started redeploying." Dunwoody said that though the mission in Haiti is wrapping up, contracting support assets are still helping in Chile, which suffered a massive earthquake in February.

"On top of everything else that is going on, our Army is in motion through BRAC [base closure and realignment]," said Dunwoody. All four major headquarters—Army Forces Command, Army Training and Doctrine Command, AMC, and Army Installation Management Command—will be moving in fiscal year 2011.

Along with the organizational changes of BRAC, General Dunwoody is planning life-cycle management improvement. "We have multiple owners, and that creates seams in this whole life-cycle management piece," said General Dunwoody. "It creates a lack of accountability and responsibility, and that is what we are trying to get our arms around."

UPCOMING EVENTS

Army Operations Research Symposium

The Center for Army Analysis will host the Army Operations Research Symposium 2010 from 13 to 14 October at the Army Logistics University at Fort Lee, Virginia. This year's theme is "Full Spectrum Operations in a Complex Environment." Anyone interested in attending must preregister before 24 September. For more information or to preregister, go to the website, www.alu.army.mil/AORS/aorshome.htm.

Military Logistics Summit 2010

The Institute for Defense and Government Advancement (IDGA) will hold Military Logistics Summit 2010 from 13 to 16 September in Vienna, Virginia. The summit will bring together leaders and decisionmakers from the logistics community to discuss the latest initiatives and implementation strategies that ensure future military flexibility and preparedness. The summit will feature information on supporting major deployment, redeployment, and distribution operations based on updated Department of Defense mission priorities. For more information or to register, visit the following website: www.MilitaryLogisticsSummit.com.

In March, Soldiers from the 1314th Civil Affairs Company conducted a final inspection of radio and camera equipment at Contingency Operating Base Basra, Iraq, before turning it in as part of the responsible drawdown. (Photo by SPC Maurice A. Galloway, 17th Fires Brigade PAO).

General Dunwoody said that while the Army has gotten good at buying and delivering equipment, 75 percent of life-cycle costs reside in the sustainment, maintenance, and eventual disposal of equipment. “We are paying storage costs, we are paying maintenance costs, and we have got to get after the tail end of the life-cycle With the help of the Department [of Defense], we’re identifying equipment as excess defense articles, which makes it available for Foreign Military Sales.”

General Dunwoody laid out three changes that will improve AMC’s service to future operations. First, AMC will attempt to manage materiel sources of repair by taking operational control of directorates of logistics (DOLs) to manage their workloads. According to Lieutenant General James H. Pillsbury, deputy commanding general and chief of staff of AMC, the 77 DOLs in the Army had 83 contracts with more than 40 different contractors. “No bad actors, but you can see the inefficiencies in that,” said General Pillsbury. “I think that you will see some great efficiencies come down this path in the years to come.”

Second, AMC plans to optimize the way it manages materiel by acting as the central manager for all Army materiel. A pilot, beginning in July 2010, is testing the concept of using the Army Sustainment Command as the central manager of all stakeholders’ materiel in support of the Army Force Generation (ARFORGEN) cycle.

Third, AMC wants to manage the piles of equipment—theater-provided equipment, theater sustainment stocks, prepare-to-deploy training piles, and left-behind equipment—that have accumulated over time. General Dunwoody noted that many of these piles did not exist before 11 September 2001. Now it needs to be decided who will manage this equipment in support of ARFORGEN.

17th Fires Brigade Draws Down Equipment

As U.S. forces redeploy in accordance with the security of forces agreement with the Iraqi government, the 17th Fires Brigade, based out of Joint Base Lewis-McChord, Washington, is drawing down equipment that will not be needed by the units replacing it.

The brigade deployed in support of Operation Iraqi Freedom in July 2009 and has maintained a large footprint in Basra province with the help of military transition teams and other smaller units attached to the brigade. These units have relied on the 17th Fires Brigade to support them logistically as they have conducted



operations around Basra. The brigade also is responsible for tracking the excess equipment, including vehicles, computers, and radios, the units have as they draw closer to the September deadline.

Since brigades designated to advise and assist the Iraqi Security Forces will have significantly less personnel than the units they replace, the drawdown to 50,000 U.S. troops in the Iraq by 1 September ultimately requires equipment to be turned in for maintenance and reallocation.

Over the past 7 years, U.S. forces have established bases in support of Operation Iraqi Freedom. These bases are home to billions of dollars’ worth of equipment that now needs to be returned to the United States or reallocated to other theaters.

While general equipment is pulled out of bases handed over to the Iraqi Army, basic life support equipment, such as showers, tents, and furniture, will remain to support their security mission.

Pentagon Exhibit Shows Sustainers at Work

In April, the Office of the Deputy Chief of Staff, G-4, Department of the Army, unveiled “Army Logistics Around the World” at the Pentagon. The display honors Army logisticians working worldwide by showcasing video clips and photos of current sustainment operations over six large video monitors. The display can be found on the 1st floor, in the 4th corridor of the A ring.

The Deputy Chief of Staff, G-4, Lieutenant General Mitchell H. Stevenson, is encouraging units to submit videos and photos of Soldiers performing sustainment missions to the G-4 staff for the display.



The new Pentagon exhibit, “Logistics Around the World,” honors logisticians at work through photos and videos of them on the job. (Photo by Leroy Council, Jr., Army Multimedia and Visual Information Directorate, HQDA).

Photos should be submitted in a standard file format, such as .jpg. They should be larger than 720 by 480 pixels and at least 72 dots per inch. The photos must not be edited or altered, and no captions or text should be embedded with the photos. However, submitters should include a description of the action in the photo in the file’s metadata or in a separate Microsoft Word document. This caption should include the photo’s “who, what, when, and where.”

Acceptable video files include high resolution files in a .wmv, .mov, or .mpeg format. If the video has no narration, it should include a descriptive caption like the one described for photos. The caption submissions guidelines for videos are also the same as guidelines for photos—they should be in the metafile or in a separate Microsoft Word document. All photos, videos and captions need to be approved for public release by the security office of the submitter’s unit or organization.

Further guidelines and an update schedule for the display can be received by sending an email to devon.hylander@us.army.mil.

Chief of Staff Honors Logistics Professionals

The Chief of Staff of the Army presented the 2010 Combined Logistics Excellence Awards, honoring 82 Army units for their accomplishments in supply, maintenance, and deployment logistics, at a ceremony on 24 June in Richmond, Virginia.

The **Deployment Excellence Award** winners are—
Operational Deployment

Small Category. 66th Engineer Company, 2d Stryker Brigade Combat Team, 25th Infantry Division, Schofield Barracks, Hawaii.

Large Category. 72d Infantry Brigade Combat Team, TXARNG, Spring, Texas.

All Army Installation

Fort Hood, Texas.

Active Army

Small Category. Headquarters and Headquarters Company, 391st Combat Sustainment Support Battalion, Bamberg, Germany.

Large Category. 72d Expeditionary Signal Battalion, Mannheim, Germany.

Supporting Category. 39th Transportation Battalion (Movement Control), Kaiserslautern, Germany.

Army National Guard

Small Category. B Company, 3d Battalion, 20th Special Forces Group (Airborne), Roanoke Rapids, North Carolina.

Large Category. 1st Battalion, 125th Infantry Regiment, Flint, Michigan.

Supporting Category. Fort Sill Mobilization and Deployment Brigade, Fort Sill, Oklahoma.

Army Reserve

Small Category. Detachment 2, 304th Sustainment Brigade, Riverside, California.

Large Category. 1184th Deployment and Distribution Support Battalion, Mobile, Alabama.

Supporting Category. Fort Sill Mobilization and Deployment Brigade, Fort Sill, Oklahoma.

The **Maintenance Excellence Award** winners are—

Active Army

Small Category Modification Table of Organization and Equipment (MTOE). B Company, 307th Brigade Support Battalion, Al Asad Air Base, Iraq.

Small Category Table of Distribution and Allowances (TDA). Busan Storage Center, U.S. Army Materiel Support Center-Korea, Busan, Korea.

Medium Category MTOE. 528th Quartermaster Company, Joint Base Lewis-McChord, Washington.

Medium Category TDA. Headquarters and Headquarters Company, 206th Military Intelligence Battalion, Fort Gordon, Georgia.

Large Category MTOE. B Company, 615th Aviation Support Battalion, Fort Hood, Texas.

Large Category TDA. U.S. Army Materiel Support Center-Korea, Camp Carroll, Korea.

Army National Guard

Small Category MTOE. B Company, 634th Base Support Battalion, Champaign, Illinois.

Small Category TDA. Field Maintenance Shop 6, Evansville, Indiana.

Medium Category MTOE. 3622d Maintenance Component Repair Company, Fort Indiantown Gap, Pennsylvania.

Medium Category TDA. Maneuver Area Training Equipment Site-New York, Fort Drum, New York.

Army Reserve

Small Category MTOE. Forward Support Company, 321st Engineer Battalion, Boise, Idaho.

Small Category TDA. Area Maintenance Support Activity 57 (Ground), New Century, Kansas.

Medium Category MTOE. 238th Maintenance Company, San Antonio, Texas.

Depot

Letterkenny Army Depot, Chambersburg, Pennsylvania.

Army Installation Management Command

Small Category. U.S. Army Garrison-Benelux, Chievres, Belgium.

Medium Category. Installation Materiel Maintenance Activity, Fort McCoy, Wisconsin.

Large Category. Materiel Maintenance Division, Directorate of Logistics, Fort Bragg, North Carolina.

The **Supply Excellence Award** winners are—

Active Army

Unit Level MTOE. Headquarters, A Detachment, 176th Finance Management Company, Yongsan, Korea.

Unit Level TDA. 7th Army Noncommissioned Officer Academy, Grafenwoehr, Germany.

Property Book Level MTOE. 69th Air Defense Artillery Brigade, Fort Hood, Texas.

Property Book Level TDA. Womack Army Medical Center, Fort Bragg, North Carolina.

Parent Level MTOE. 30th Signal Battalion, Wheeler Army Airfield, Hawaii.

Parent Level TDA. 7th Army Joint Multinational Training Center, Hohenfels, Germany.

Supply Support Activity MTOE. 5th Battalion, 7th Air Defense Artillery Regiment, Kaiserslautern, Germany.

Supply Support Activity TDA. 498th Combat Sustainment Support Battalion, Supply Point 60, Camp Carroll, Korea.

Army National Guard

Unit Level MTOE. B Battery, 1st Battalion, 148th Field Artillery Regiment, Rexburg, Idaho.

Unit Level TDA. Headquarters, 209th Regional Training Institute, Ashland, Nebraska.

Property Book Level MTOE. 347th Regional Support Group, Roseville, Minnesota.

Property Book Level TDA. 771st Troop Command, Charleston, West Virginia.

Parent Level MTOE. Headquarters, 1st Battalion, 201st Field Artillery Regiment, Fairmont, West Virginia.

Parent Level TDA. Joint Forces Headquarters, Madison, Wisconsin.

Supply Support Activity TDA. U.S. Property and Fiscal Office, Indianapolis, Indiana.

Army Reserve

Unit Level TDA. Headquarters, 108th Training Command, Charlotte, North Carolina.

Property Book Level TDA. Southeast Medical Area Readiness Support Group, Nashville, Tennessee.

Supply Support Activity MTOE. Headquarters, Regional Support Command, Standard Army Retail Supply System-1 Site, Fort McCoy, Wisconsin.

RECENTLY PUBLISHED

Training Circular (TC) 4-11.46, Convoy Protection Platform Gunnery, was published in April 2010 and provides the first Army-wide standardized table for gunnery training in sustainment units. The circular was developed in response to the recognition that today's sustainment units are likely to defend themselves, their convoys, and their sustainment bases by engaging opposing forces with direct fire.

TC 4-11.46 provides the guidance for commanders of sustainment units on training and deploying convoy protection platforms and convoy escort teams. It also provides guidance to sustainment elements attached, assigned, or under the operational control of theater sustainment commands, expeditionary sustainment commands, and sustainment brigades. This TC is also applicable to base support battalions and forward support companies organic to fires, combat aviation, maneuver enhancement, and battlefield surveillance support brigades for the purposes of training senior gunners, vehicle gun crews, and vehicle crew evaluators on the employment of crew-served weapons in operations. The tasks outlined in the manual should be used to evaluate the proficiency of vehicle gun crews.

The supporting training ammunition strategy for TC 4-11.46 has been approved by the Army munitions requirements council of colonels and will be available in the upcoming version of Department of the Army Pamphlet 350-38, Standards in Training Commission.

Field Manual (FM) 3-35, Army Deployment and Redeployment, published in April 2010, combines doctrine previously published in 5 different FMs to align Army deployment doctrine with joint deployment doctrine. The new FM is the Army's new doctrine for planning, organizing, executing, and supporting deployment and redeployment. Included in the doctrine are sections on force protection and the deployment process, activities units engage in prior to alert of deployment, and procedures for the movement of units and reception, staging, onward movement, and integration.

New appendices have been added covering installation support, unit movement plans, the duties of the mobility officer and the unit movement officer, and the influence of senior leaders on deployment. Additional appendices address special cargo (such as hazardous material, ammunition, and classified and sensitive shipments), automatic identification technology, and automated mobility systems.

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