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Life-Cycle Management

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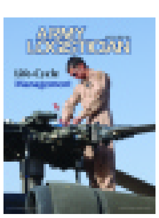

Cover: The life-cycle management command (LCMC) initiative is intended to increase the readiness of weapon systems by better integrating technology, acquisition, and logistics. The result will be better-performing systems that reduce the sustainment burden on the soldier. In the article beginning on page 2, the commanding general of the Army Aviation and Missile Command—the first LCMC—discusses the thinking behind the initiative. The cover photo shows a soldier in the 45th Medical Company (Air Ambulance) at Camp Babylon, Iraq, performing preventive maintenance checks and services on a UH–60 Black Hawk helicopter that is used to evacuate and transport soldiers to medical facilities.

STAFF
Janice W. Heretick, Editor
Robert D. Paulus, Associate Editor
Janice L. Simmons, Assistant Editor
April K. Morgan, Assistant Editor
Louanne E. Birkner, Administrative Assistant

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By Order of the Secretary of the Army:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

Official:

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0435706

World Wide Web address:
http://www.almc.army.mil/alog

ALOG NEWS

AMC UNITS IN EUROPE MERGE

The Army Materiel Command's (AMC's) Army Field Support Command merged its Combat Equipment Group-Europe and AMC Forward-Europe in November, forming the AMC Field Support Brigade-Europe. The new unit will deliver the full spectrum of logistics power projection and support to forces in the field.

"Adopting a brigade structure aligns us with the expeditionary Army units we support in Europe and beyond," said Colonel Max Lobeto, commander of the newly formed brigade. "Our mission is unchanged: AMC Field Support Brigade-Europe provides an essential and enduring link from America's arsenal to units and troops in the field."

More than 300 people form the core of the brigade, and several hundred host nation service providers and contractors provide capabilities ranging from mechanical repairs to logistics assistance. Representatives of AMC's major subordinate commands, such as the Army Tank-automotive and Armaments Command and the Army Aviation and Missile Command, provide expertise and equipment directly to soldiers in the field.

Pre-positioned equipment and repair capabilities are prominent features of the new command. Field support battalions—formerly called combat equipment battalions—in Italy, Luxembourg, the Netherlands, and the United Kingdom will deliver combat-ready equipment to the battlefield as they have for the past 20 years.

DLA–TRANSCOM PARTNERSHIP SEEKS TO REDUCE FRUSTRATED CARGO

The Defense Logistics Agency (DLA), in partnership with the U.S. Transportation Command (TRANSCOM), the Department of Defense (DOD) Distribution Process Owner, has taken on the task of eliminating frustrated freight that often occurs with vendor shipments to locations outside of the continental United States. This effort, called the Direct Vendor Delivery (DVD) Processes Initiative, is one of several initiatives designed to improve end-to-end distribution within DOD. Collaborating with DLA and TRANSCOM on the DVD initiative are the Office of the Secretary of Defense, the Joint Staff, the U.S. Joint Forces Command, the DOD Government Purchase Card (GPC) Project Management Office, the military services, and the General Services Administration (GSA).

Problems ranging from illegible, incomplete, or missing military shipping labels (MSLs) to poor coordination among contractors, GPC holders, and their transportation support offices can cause delays or "frustrations" along the transportation supply chain and sometimes result in shipments that never reach the intended recipients. However, an analysis conducted in 2004 of frustrated cargo destined for locations outside the United States showed that incorrectly prepared MSLs account for 98.8 percent of the problems. Although policies and procedures already in effect provide guidance on shipping information requirements, the problem appears to lie in a lack of knowledge, misuse, or avoidance of these procedures among users.

To solve the problem of neglected transportation requirements, a DVD Processes Initiative Team developed a document titled "The GPC Guide to Overseas Shipments," which was issued last July to GPC holders. The goal of the guide is to ensure that proper shipping information is included on MSLs in order to facilitate in-transit visibility of GPC shipments.

According to the guide, cardholders must coordinate with their installation transportation office, transportation management office, or supply support activity, as applicable, before an item is ordered from a vendor to obtain the correct information for the MSL. If a package arrives at a consolidated control point, such as a Defense distribution depot, without a complete shipping label, the package must be taken "off line" for research and manual processing, which slows down consolidation and shipping and detracts from support provided to the warfighter.

A 120-day pilot was conducted last spring to test the capability of specific automated systems to manage and reduce frustrations of GPC shipments and provide in-transit visibility. Lessons learned from this pilot will be used to test other automated capabilities for managing GPC transactions from vendors who do not use GSA and DOD order-management systems. The data obtained will help the DVD team to reduce frustrated shipments in order to improve support to military customers.

(ALOG NEWS continued on page 44)

Life-Cycle Management: Reducing the Burden on the Soldier

BY MAJOR GENERAL JAMES H. PILLSBURY

Major General James H. Pillsbury is the Commanding General of the Army Aviation and Missile LCMC.

The life-cycle management command initiative is changing how the Army's technology, acquisition, and sustainment activities function. What does this change mean for the soldier in the field?

As reported in the last two issues of Army Logistician*, the Army has undertaken a major initiative to bring together the major subordinate commands (MSCs) of the Army Materiel Command (AMC) and the program executive officers (PEOs) and program managers (PMs) reporting to the Army Acquisition Executive (AAE) to form life-cycle management commands (LCMCs). The Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASAALT), who is also the AAE, signed an implementation directive on 5 October 2004 establishing the first LCMC, the Aviation and Missile LCMC at Redstone Arsenal, Alabama.* Army Logistician *invited the commander of the Aviation and Missile LCMC, Major General James H. Pillsbury, to discuss the LCMC initiative and what it means for logisticians in the field.*

What is the basic thinking behind the LCMC initiative? What problems with the current structure of AMC MSCs and PEOs and PMs is the initiative designed to remedy?

Since its creation in 1962, AMC has grown and undergone many reorganizations. Much of the organizational change has sought to address the question of how best to manage the command's two major functional areas—materiel development and materiel readiness (or sustainment). AMC's organization has tended to alternate between periods when the two functions were merged into MSCs largely organized along commodity lines (aviation and missile, tank-automotive, etc.) and periods when the two functions were separated. The latter arrangement was most clearly evident from 1976 to 1984, when AMC was known as the Army Materiel Development and Readiness Command (DARCOM) and organized into parallel commodity MSCs, one for research and development and one for materiel readiness for each commodity area. In 1984, the parallel commands were reunited into single commodity MSCs and AMC reassumed its original name. Then, in 1987, the materiel development and acquisition functions were largely removed from AMC to a new structure of PEOs and PMs reporting to a new position outside of AMC—the AAE. This change, to some degree, reinstated the DARCOM division between materiel development and acquisition functions and sustainment functions.

At present, the missions remain divided, the ASAALT with development and acquisition and AMC with sustainment. The vision of the life-cycle management command is to unite those mission areas by creating single commands with responsibility for all three areas (technology, acquisition, and sustainment).

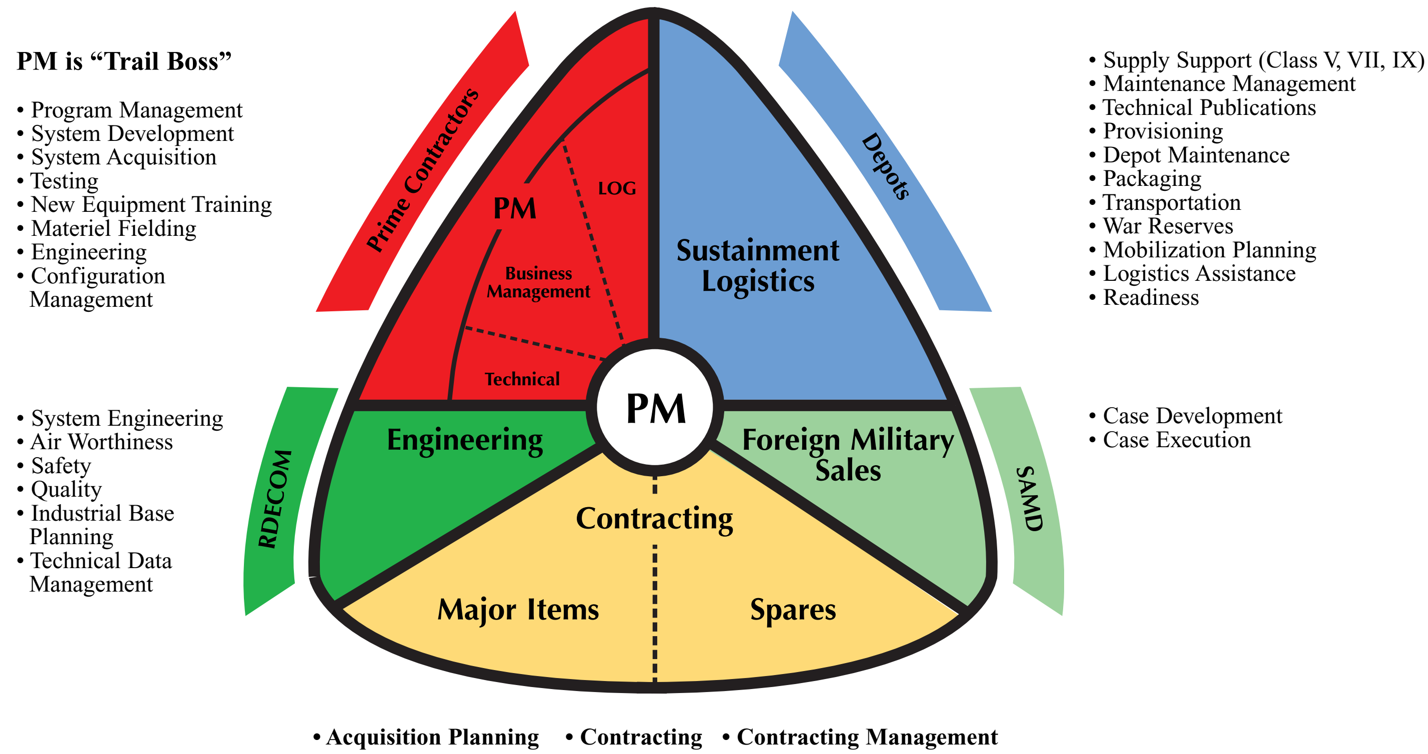
The organization chart of the Aviation and Missile LCMC looks rather complicated. To what degree will the staffs of the Aviation and Missile Command (AMCOM) and the PEOs and PMs be integrated?

The Aviation and Missile LCMC initially will be comprised of all elements of the current Aviation and Missile Command and the Program Executive Office, Aviation. The PEO Tactical Missiles and the PEO Air, Space and Missile Defense are working on plans to merge into a single PEO. Effective 1 June 2005, the merged PEO Missiles and Space organization will be included as part of the Aviation and Missile LCMC.

I am the commander of the LCMC, and Paul Bogosian, PEO Aviation, assumes additional duties as the Deputy to the Commander for Aviation. When the newly merged PEO Missiles and Space joins the LCMC in June, Brigadier General Mike Cannon will assume additional duties as the LCMC Deputy Commanding General for Missiles and Space.

Aviation and Missile Life-Cycle Management Command

PM is The Total Life-Cycle System Manager



Under the LCMC initiative, the program manager is responsible for all aspects of the life cycle of a weapon system, including its development, acquisition, and sustainment.

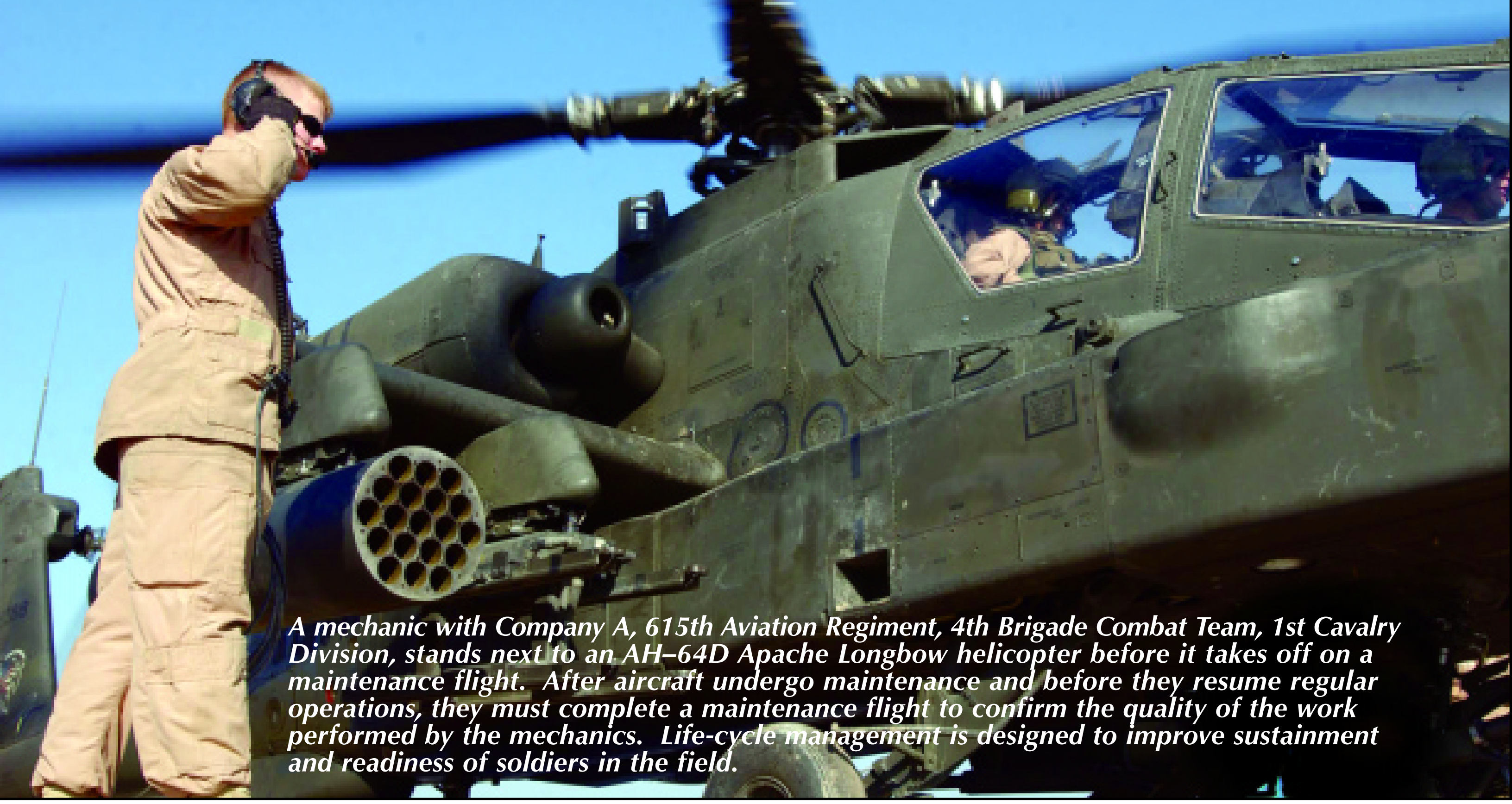
The intent of the LCMC concept is to better integrate Army acquisition, logistics, and technology efforts through closer alignment of AMC's major subordinate commands with their regionally associated PEOs under a single commander, who will be the focal point and have primary responsibility for the life cycle of all of the groupings of systems assigned to the LCMC. Today, system development and acquisition responsibilities reside in the PEOs and sustainment falls to the AMC MSCs. The PEOs remain the single point of accountability for accomplishing program objectives through the integration of total life-cycle systems management.

The LCMC will involve all command and PEO elements in a more integrated environment that will influence near-term readiness, future modernization, and sustainment. PEOs will have closer ties to the sustainment community, assuring the smoother flow of better products to the field, while retaining direct links to the AAE, in full compliance with the provisions of the 1986 Goldwater-Nichols Act. The PEOs will be able to work as an integral part of the AMC MSCs, while continuing to report directly to the AAE. AMCOM elements will have enhanced input into acquisition processes to influence future sustainment and readiness.

The AMCOM staff will initially form the nucleus of the LCMC coordinating staff. The PEO staffs and the AMCOM coordinating staffs will remain unchanged initially, but an in-depth "bottom-up review" of staff functions is planned to identify opportunities to gain efficiencies through additional centralization or decentralization. Realigned staff functions may reside at the command level or in the PEO staffs, as determined in the bottom-up review. Following this review, a general officer steering committee comprised of AMCOM and PEO senior leaders will make the final determination on which functions, if any, are consolidated or further decentralized. The intent is to develop LCMC and PEO staff structures that provide maximum support to the PEOs and weapon system teams as they manage the life cycle of the weapon systems and to relieve the PEOs and PMs of administrative staff responsibilities so they can better focus on system acquisition and soldier support.

What role will AMC's Research, Development, and Engineering Command play under the LCMC initiative? How will it support the Aviation and Missile LCMC?

The Aviation and Missile Research, Development, and Engineering Center (AMRDEC) is a strategically



A mechanic with Company A, 615th Aviation Regiment, 4th Brigade Combat Team, 1st Cavalry Division, stands next to an AH–64D Apache Longbow helicopter before it takes off on a maintenance flight. After aircraft undergo maintenance and before they resume regular operations, they must complete a maintenance flight to confirm the quality of the work performed by the mechanics. Life-cycle management is designed to improve sustainment and readiness of soldiers in the field.

and operationally aligned partner of the LCMC. AMRDEC will continue to provide life-cycle engineering and technology transition to the LCMC through integrated support to weapon system teams. The AMC Research, Development, and Engineering Command (RDECOM) will coordinate the support provided to the Aviation and Missile LCMC from other RDECs, the Army Research Laboratory (ARL) and Army Research Office (ARO), and the Army Materiel Systems Analysis Activity (AMSAA). [The other RDECs are the Armaments RDEC (ARDEC), Tank-Automotive RDEC (TARDEC), Communications-Electronics RDEC (CERDEC), and Natick Soldier Center at the Soldier Systems Center (SSC).] The matrix support concept, which provides functional specialists to the PMs from AMCOM and the AMRDEC, will continue as the preferred method of configuring the support elements required by the PMs in performing their total life-cycle management responsibilities.

The LCMC provides the organizational structure to support integrated weapon system teams. The first of these teams, initiated by the Project Manager Cargo Helicopter, in 2002, will become the model for future Soldier Focused Life-Cycle Management (SFL) teams, which will be developed over time and tailored to meet the unique needs and requirements of each PM and the weapon system supported. The end state will be SFL teams established for all PMs within the command, covering every aspect of life-cycle management for supported systems.

What is Soldier Focused Life-Cycle Management?

SFL is an organizational and management transformation for weapon systems management that focuses on integrating AMCOM, related PEOs, and supporting functions at the operational level in order to make significant improvements in readiness and the go-to-war capability of each weapon system.

Under SFL, the project manager will provide day-to-day operational control and guide the decision-making processes that affect the weapon system, including overseeing supporting activities from AMCOM—such as the Integrated Materiel Management Center (IMMC), Acquisition Center, Security Assistance Management Directorate (SAMD)—and the AMRDEC. Operationally controlled personnel will maintain a strong and clear relationship with their owning organization. The initiative is based on robust, actionable information flow about equipment status, beginning at the weapon system and flowing back to a combined PM/AMCOM team. SFL enablers are being designed to provide the PM with the necessary information and inputs with which to make decisions that will maximize system performance and minimize the sustainment burden for the soldier.

How does SFL improve support system readiness and support to the field?

The purpose of SFL is to maximize both the service provided to the soldier and the go-to-war capability of the weapon system. In the field, the soldier cares little about how the acquisition and sustainment communities are organized or managed. What is important to the soldier is having a functional weapon system (reliable and effective), having a single point of contact when help is needed, and having all the folks back home do everything possible to minimize the soldier's burden. The logistics assistance representative (LAR) and the AMRDEC Aviation Engineering Directorate (AED) liaison engineers (LEs) are the soldier's direct interface in the field for support from the acquisition and sustaining bases. The SFL team will improve system readiness by giving the LAR and LE a direct conduit to the total support structure for the system. SFL teams will improve the go-to-war capability of the system by improving communication, decisionmaking, system optimization, and response times to the soldiers' needs.

The SFL concept solves many coordination and optimization problems that have resulted from the separation between the weapons system acquisition and sustainment communities. The concept provides for a single person to be accountable for and in control of the readiness of a weapon system.

How will this work?

The activities necessary to support the life cycle of a weapon system have previously been divided between two Army elements and, within those elements, multiple organizations and directorates. Part of the SFL concept is to integrate each of the activities necessary for the support of the weapon system life cycle into a single team under the day-to-day management of the PM. These weapon system teams will be composed of elements from the PM, Acquisition Center, IMMC, SAMD, and the AMRDEC, with a portion of the personnel physically collocated with the PM.

However, SFL is much more than collocation. Collocation only sets the stage for efficient and effective management and coordination. *Integration* is the desired state and is attained by collocating supporting personnel with a single weapon system authority and establishing common metrics and process improvement tools, such as robust information flow from the field, readiness modeling capability, Lean [management principles], and Six Sigma [methodology]. This integration is expected to produce significant improvements in weapon system support to the warfighter and equally significant improvements in life-cycle management effectiveness and efficiency.

When will it happen?

The plan is to incorporate the SFL weapon system management concept in each of the aviation and missile weapon systems in fiscal year 2005. An ideal situation would be one where lessons learned from the CH–47 [Chinook helicopter] pilot program could be used to develop a "model" for SFL implementation that could be used for each weapon system. The reality, however, is that not all SFL implementations will look alike. Differences in weapon systems' life cycles will affect the form of the SFL teams, and differences in the matrix structures of the missile and aviation teams may also result in different SFL team structures. However, the general principles of consolidating the activities of a weapon system life cycle and giving control and authority to execute the life-cycle management mission to the PM will remain the same.

How will you know if it is working?

For the CH–47 SFL team, the best measure of our ability to meet the soldier's need is the readiness of the system as measured by its go-to-war capability. For the CH–47 pilot program, all of the metrics used to measure the weapon system are being correlated to the three primary vectors: reduction in downtime rates, reduction in demand rates, and reduction in total cost of ownership. By managing and improving the activities that most significantly improve these three areas, the CH–47 SFL teams will reduce the maintenance burden on the soldier in the field and improve the go-to-war capability (and thus the readiness) of the system. A cross-functional integrated process team (PEO/PM, AMCOM, and the AMRDEC) has been established to develop the system of measurements that will be used to assess the effectiveness of SFL and the LCMC concept.

SFL implementation is providing unparalleled weapon system support that reduces the burden on the soldier, meets the Army transformation goals, and affords the project managers an unprecedented capability to manage their combat systems and accurately predict a true "go-to-war" capability. The focus of this effort is improved system availability and readiness, continuous performance improvement, reduced operating and support cost, and truly integrated life-cycle management. The three top priorities of this transformation are—

- Reduce the burden on the soldier.
- Reduce the burden on the soldier.
- Reduce the burden on the soldier.

ALOG

Major General James H. Pillsbury is the Commanding General of the Army Aviation and Missile Life-Cycle Management Command at Redstone Arsenal, Alabama. He previously served as the Deputy Chief of Staff, G–4, at U.S. Army Europe and Seventh Army in Germany. General Pillsbury is a graduate of the Infantry Officer Basic Course, the Transportation Officer Advanced Course, the Army Command and General Staff College, and the Army War College. He has a B.A. degree in history from Trinity University in Texas and an M.S. degree in international relations from Troy State University in Alabama.

Nonstandard Logistics Sustainment Support in the Stryker Brigade Combat Teams

BY GREGORY L. ALDERETE

The development of Stryker brigade combat teams has led to several innovations in supporting nonstandard equipment.

In 1803, President Thomas Jefferson won congressional approval for a mission of epic proportions. Two former Infantry captains, Meriwether Lewis and William Clark, would lead a group of soldiers, called the "Corps of Discovery," on what became a 2–year adventure to find navigable river routes to the Pacific. Two hundred years later, the same glacial prairies of the Pacific Northwest that Lewis and Clark crossed to reach the ocean would again challenge men, and now women, of the U.S. Army—this time with technology so advanced it would change the face of the modern battlefield.

Under the daunting shadow of Mount Rainer came the final word: Fort Lewis, Washington (named after Meriwether Lewis), would host the initial fielding phase of the Army's first Stryker brigade combat teams (SBCTs): the 3d Brigade, 2d Infantry Division, and the 1st Brigade, 25th Infantry Division (Light). [The Army plans to establish six SBCTs. The other four units planned for conversion to SBCTs are the 172d Infantry Brigade at Fort Wainwright, Alaska, the 2d Cavalry Regiment at Fort Lewis, the 2d Brigade, 25th Infantry Division (Light), at Schofield Barracks, Hawaii, and the 56th Brigade, 28th Infantry Division (Mechanized), Pennsylvania Army National Guard.]

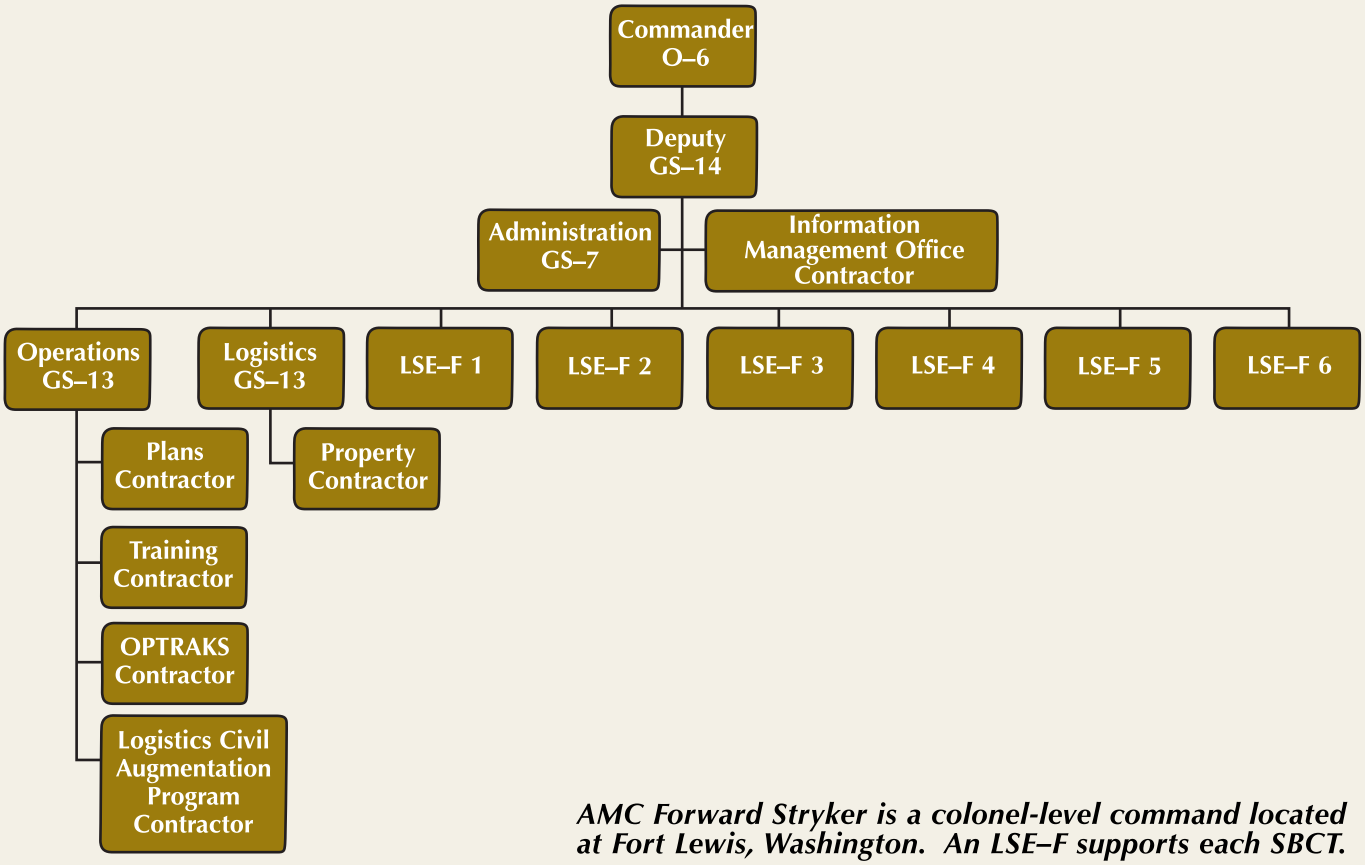
Ironically, it had been almost 20 years since the Chief of Staff of the Army at that time, General Edward C. Meyer, selected the "Old Reliables" of the 9th Infantry Division (Motorized) to host a high-technology test bed project. The project was known affectionately as "Boys with Toys," and its goal was to develop a high-technology, rapidly deployable light division that could engage heavy threat forces. A new fielding process was developed to effectively integrate available commercial technology. This task required new methods of testing doctrinal concepts and equipment. Many emerging concepts tested by the division, such as palletized loading procedures, survived the project and were adopted by the Army, but the high-technology light division itself did not.

The skeptical ghosts of this experience shadowed Chief of Staff General Eric K. Shinseki's transformation effort announced in October 1999, including his plan to create two medium-weight initial brigade combat teams at Fort Lewis. However, after a triumphant year of combat success in Iraq, the 3d Brigade, 2d Infantry Division—the first SBCT—has forever laid to rest those demons of past innovation efforts. According to the current Chief of Staff, General Peter J. Schoomaker, "Stryker comes with more infantry in it than any other formation—1,160 per brigade. . . . The Stryker's speed and agility gives us the best operating radius and abilities we have ever had."

The SBCT concept is built on a lethal, rapidly deploying modular force, tailored to operational requirements, that can arrive anywhere in the world within 96 hours after liftoff. The introduction of the new eight-wheeled, 19-ton, $2-million Stryker armored vehicle—named after two posthumous Army Medal of Honor recipients, Private First Class Stuart Stryker of World War II and Specialist Robert Stryker of Vietnam War—has received significant publicity. The structure of the SBCT has become the touchstone for the brigade-based modular Army of the future.

AMC Forward Stryker

Transformation requires a combination of revolutionary, evolutionary, and emerging doctrine. To accomplish the SBCT transformation, new heights of innovation and staff coordination were required. The Commanding General of the Army Materiel Command (AMC) and the Program Executive Officer (PEO) for Ground Combat Systems agreed to provide Fort Lewis with a single point of contact for all materiel fielding issues associated with the SBCTs. The I Corps Transformation Support Office was created in March 2001 to serve as that single point of contact for the materiel development community. The Chief of the Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Special



AMC Forward Stryker is a colonel-level command located at Fort Lewis, Washington. An LSE–F supports each SBCT.

Projects Office—a temporary field office of the PEO for Command, Control and Communications Tactical located at Fort Lewis—was dual-hatted as the Director of the Transformation Support Office.

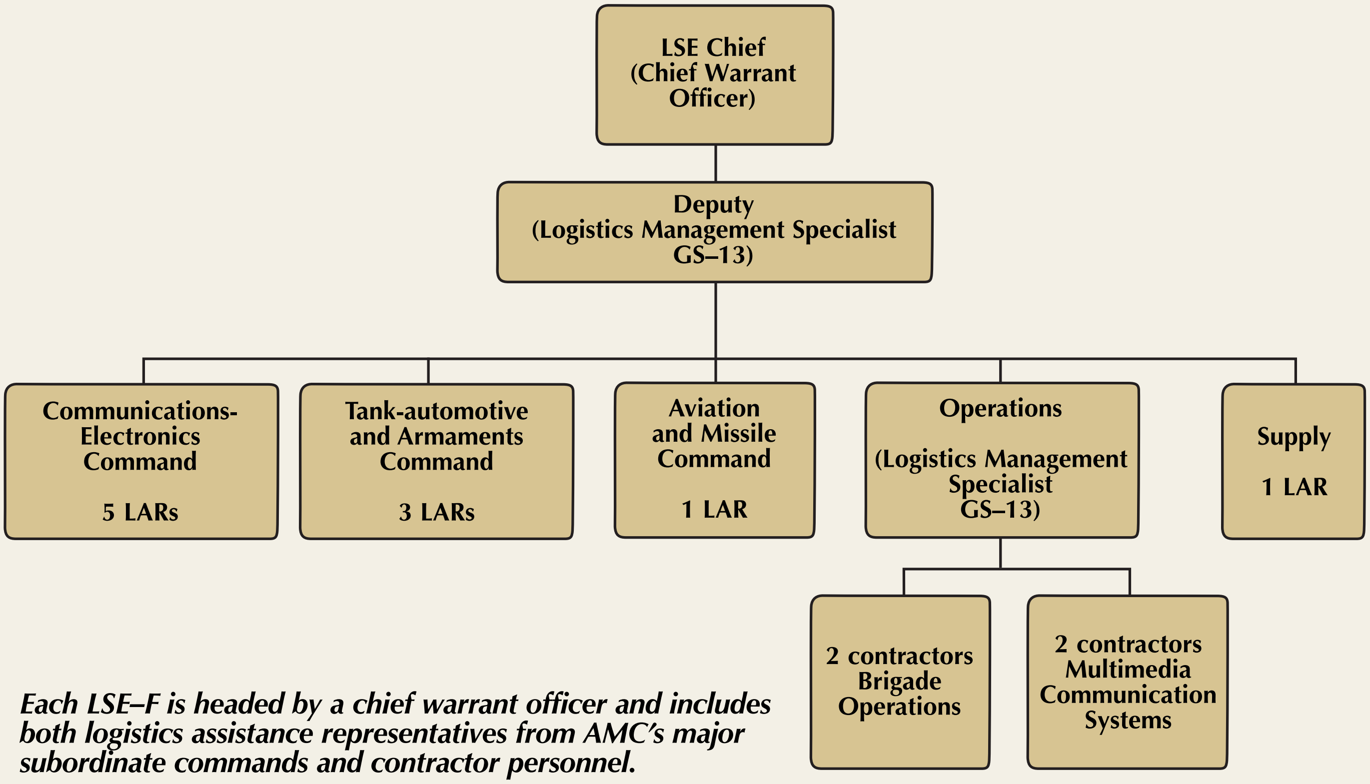
In the fall of 2002, AMC's Operations Support Command (now the Field Support Command [FSC]) established AMC Forward Stryker, a colonel-level command, to assume the materiel fielding and command and control mission for all six SBCT AMC logistics support elements forward (LSE–Fs). (The Army is already discussing adding Stryker brigades. "By the time we get to five or six," General Schoomaker has stated, "we may want to go for even more." AMC Forward Stryker would continue to support additional Stryker requirements.)

Historically, AMC has deployed LSEs based on the operational needs of the supported unit or theater. The LSEs are task-organized with logistics assistance representatives (LARs) assigned to logistics assistance offices worldwide. During contingencies, command and control of LSEs transfers to the theater AMC forward commander. Unlike the traditional LSE, an SBCT LSE–F maintains a habitual, direct support relationship with its SBCT during both peacetime and contingency operations. This ingrained familiarity has proven to be a combat multiplier as operational proficiency is routinely rehearsed and reinforced. An inherent mission under this concept of support is the mobilization and operational control of approximately 115 to 150 SBCT contractors and Department of the Army civilians.

In June 2003, AMC published the SBCT Fielding and Support Concept. This concept provided an overarching approach to coordinating and synchronizing the fielding of the SBCTs, including AMC's sustainment responsibilities after fielding is completed. In November 2003, the Army Deputy Chief of Staff, G–8, assumed materiel fielding responsibility for SBCTs and AMC Forward Stryker's focus was redirected to standing up the LSE–Fs through certification of their initial operating capability.

Unit Set Fielding

People are the key component to transformation. Unit set fielding (USF) is the key process, packaged not just to field isolated systems but a system of systems. USF synchronizes individual system fielding plans into highly structured, battalion-sized fielding schedules. The first iteration of the multiphased USF process for the first SBCT was challenging and closely managed. The systematic installation of multiple digital platforms required the efforts of several hundred



Each LSE–F is headed by a chief warrant officer and includes both logistics assistance representatives from AMC's major subordinate commands and contractor personnel.

military personnel, Department of the Army civilians, and contractors—all joining together to choreograph the critical events. New equipment soon began arriving, and the "digital-install" warehouses came to life with system contractors readily preparing their workspaces and stocking shelves.

The many digital communications systems and subsystems under the umbrella of the Army Battle Command System (ABCS) require individual and collective training of SBCT personnel to progressively integrate unprecedented situational awareness capabilities into the SBCT. The new Fort Lewis Mission Support Training Facility, a cavernous, 48,000-square foot building, provided an ideal controlled environment of 400 networked computers for training on ABCS.

The culminating milestone in 2003 was the SBCT certification exercise at the Joint Readiness Training Center at Fort Polk, Louisiana. The first SBCT—the 3d Brigade, 2d Infantry Division—was certified as having the initial operating capability for global deployment.

Army Doctrine

Field Manual (FM) 63–11, Logistics Support Element: Tactics, Techniques, and Procedures, resulted from lessons learned during Operations Desert Shield and Desert Storm in 1990 and 1991. The Army required a single AMC logistics command and control element to centrally manage strategic logistics personnel, call forward elements as required, and integrate those elements into the theater. The theater AMC LSE satisfied this need then, and it continues to do so today in Southwest Asia.

Clearly, contractor logistics support was required for the foreseeable future. FM 63–11 provided call-forward guidance requiring the AMC LSEs to control all contractors in their areas of operations. During early SBCT field training exercises, a limited contractor control cell was established under the Fort Lewis LSE for reception, staging, onward movement, and integration of systems contractors. The SBCT needed a simple reliable combat support solution to gain better control of SBCT systems contractors. AMC Forward Stryker's objective was simple—to train as it would sustain.

The Assistant Secretary of the Army for Acquisition, Logistics, and Technology and the AMC Commanding General agreed to continue with current Army doctrine mandating that the AMC LSEs act as the "single face" to the warfighter. AMC Forward Stryker began to explore the details of how to effectively integrate and embed standard and nonstandard contract logistics support under a single umbrella.

LSE–F

For the SBCT, the "single face" of materiel support is the commander of the LSE–F. The SBCT LSE–F is a task-organized team consisting of a chief warrant officer and Department of the Army civilian technicians from AMC's major subordinate commands. Each LSE–F is provided with a multimedia communication system (MMCS) and contract operators for training exercises and deployments. The LSE–F MMCS consists of 48 secure and nonsecure voice data lines and fax, nonsecure video, cellular transmissions, terrestrial lines, and satellite bands and is interoperable with the Defense Switched Network and commercial telephone service.

Goldwater-Nichols Act

The congressionally mandated separation between acquisition and sustainment required AMC Forward Stryker to dust off governing Department of Defense (DOD) acquisition directives. Under the Goldwater-Nichols Department of Defense Reorganization Act of 1986, Congress directed that control of all DOD acquisition functions be assigned to civilian leaders in each of the military departments (Army, Navy, and Air Force). PEOs and their subordinate program managers (PMs) under the Army Acquisition Executive (who is the Assistant Secretary of the Army for Acquisition, Logistics, and Technology) are directly responsible for fielding and sustaining individual systems through full materiel release. Army fielding was not a process unique to the SBCT. However, "Team Lewis" experienced growing pains in bringing multiple Army organizations, Government agencies, and civilian contractors together for the first time.

Contractor Support

Approximately 120 specialized contractors are an integral part of the SBCTs' highly complex systems maintenance, sustainment, and technical support. The Army now must ensure that contractors are planned for and integrated into all SBCT operations and risk assessments. Considering the factors of mission, enemy, terrain, troops, time, and civilians, many contractors are actually operating in the forward areas of the SBCT. However, supporting the SBCT requires the convergence of standard Army and nonstandard contractor support. For example, 57 of the 79 C4ISR systems are supported by systems contractors exclusively. As Phillip Sibley, senior LAR at the Army Communications-Electronics Command (CECOM) at Fort Monmouth, New Jersey, accurately stated, "This isn't your father's Army anymore."

Software Initiatives

Several logistics software initiatives are under development to standardize formatting and responsibilities and improve the process of achieving the logistics common operating picture.

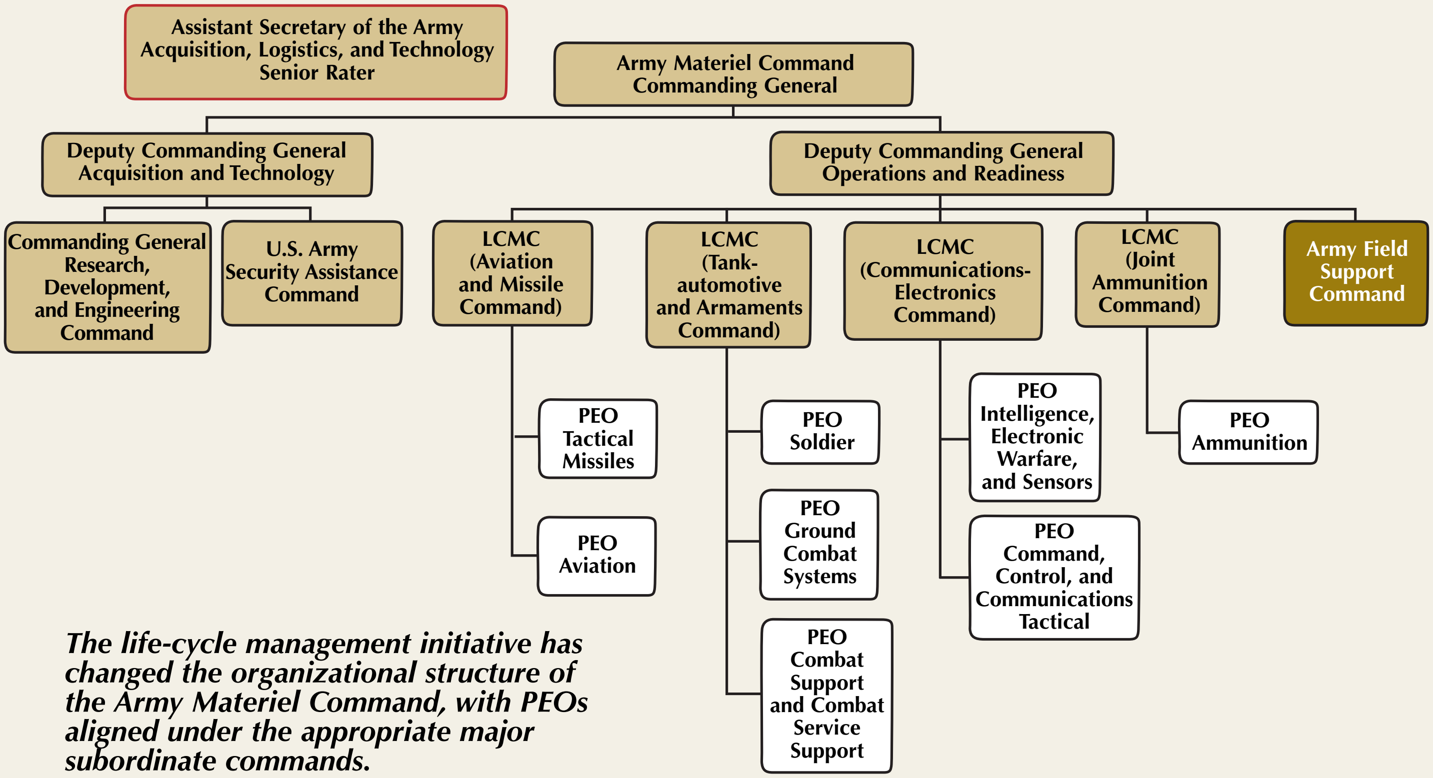
The Battle Command Sustainment Support System (BCS3) is the Army Combined Arms Support Command's scheduled replacement for the Combat Service Support Control System (CSSCS). The predictive combat functions of BCS3 are in-transit visibility, sustaining base stock and requisition status visibility, and course-of-action analysis.

The PEO for Command, Control and Communications Tactical is the Army's organization to ensure digitization and battle command interoperability throughout the force. The SPO [Special Projects Office] Tracker system provides detailed personnel data and deployment status information on contractors, Department of the Army civilians, and military personnel.

The Operational Tracking System (OPTRAKS) is a local software management tool that effectively triages problems with contractor-supported systems and accounts for contractor missions within an SBCT's area of operations. Full development of OPTRAKS began during the summer of 2004 after the system was approved by the second SBCT (the 1st Brigade, 25th Infantry Division). One year of spiral-type development during field assessments verified its reliability and interoperability with minimal risk. [Spiral development is a methodology initially developed to reduce risks on large software projects by using a cyclical approach that allows users to evaluate early results and system developers to identify problems early in the process.]

This relationally structured database is now the operational epicenter for the LSE–F. Its functional areas include trouble reports and personnel, equipment, and stockage levels of nonstandard parts (provided by the contractors). In support of total information dominance, the goal is to eventually include these capabilities in systems being managed by the PEO for Enterprise Information Systems. OPTRAKS currently is employed in support of ongoing combat operations for the Army's second SBCT, the 1st Brigade, 25th Infantry Division, in Iraq.

The LSE–F must rapidly assess systems failures with contractor field service representatives and securely send forward the correct mix of AMC LARs and field service representatives from the PEOs and PMs under the Army Acquisition Executive. The OPTRAKS file of "Frequently Asked Questions," updated by the owning contractor for each system, triages maintenance issues and provides quick solutions. Amazingly, the data reports from field testing of OPTRAKS implementation in the 1st Brigade, 25th Infantry Division, SBCT confirmed that 18 percent of all trouble reports were resolved at the LSE–F without follow-up action; no contractors or Army civilians were required to move forward to assess the problem. OPTRAKS inherently reduced risk and force protection requirements by minimizing the forward logistics footprint of unnecessary personnel. Trouble reports were not closed until the customer was satisfied.



The life-cycle management initiative has changed the organizational structure of the Army Materiel Command, with PEOs aligned under the appropriate major subordinate commands.

The soldiers and systems engineers of the SBCT have developed a sense of trust that OPTRAKS performs as designed. Database management does not remove the human factor; it increases the capability of humans to analyze data before decisions are made or conclusions reached.

Life-Cycle Management Commands

The Army acquisition process has functioned along two separate chains of command since implementation of the Goldwater-Nichols Act. Once a developed item is released to the Army, sustainment responsibility has transferred to one of AMC's commodity-oriented major subordinate commands (MSCs). That is about to change.

On 2 August 2004, the commanding general of AMC and the Assistant Secretary of the Army for Acquisition, Logistics, and Technology agreed to formalize a Life-Cycle Management Initiative by aligning selected PEOs with the appropriate AMC MSCs to create life-cycle management commands (LCMCs). The new LCMCs are Aviation/Missile, Soldier/Ground Systems, Communications/Electronics, and Joint Ammunition. PEOs will continue to report directly to the Army Acquisition Executive. The idea is that PEOs and AMC logisticians together will enhance the acquisition processes influencing future sustainment and readiness. The Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology will serve as the AMC Deputy Commanding General for Acquisition and Technology. The new position of AMC Deputy Commanding General for Operations and Readiness will serve as the command focal point for shaping AMC's future. This synergistic initiative will profoundly impact efforts to enhance "cradle to grave" modular sustainment.

The rapidly configured, brigade-based modular Army of the future will enhance our Nation's ability to project combat power. Many dedicated professionals throughout DOD and the corporate world have contributed immensely to the success of SBCT transformation. The Army is operating under a fast-moving climate of change driven by technology and corporate enterprise. This is opening the door for logisticians to break existing paradigms and explore creative concepts and solutions. Logisticians will continue to play vital roles in presenting innovative, flexible solutions that keep pace with transformational combat concepts. **ALOG**

Gregory L. Alderete is the Chief of Operations at AMC Forward Stryker at Fort Lewis, Washington. He served 24 years in the Army and is a graduate of the University of Wisconsin at Stevens Point, the Army Command and General Staff College, and the Defense Language Institute.

'Lily-Pad' Basing Concept Put to the Test

BY CAPTAIN DAVID C. CHANDLER, JR.

As the Army transforms to an expeditionary force, a new concept called "lily-pad" basing is being developed for basing troops overseas. Under this concept, the United States would not have permanent, large-scale military installations in another country. Instead of building its own bases as it has in the past, the Army would use other countries' existing facilities. It would have only a skeletal staff and an agreement with the host country that the base could be used as a forward operating base in a time of crisis. These "lily-pad" bases would be austere training and deployment sites often in areas not previously used for U.S. bases.

Can the Army's new method of expeditionary operations be supported using the "lily-pad" basing concept? Soldiers of the 21st Theater Support Command (TSC) in Kaiserslautern, Germany, sought to answer that question. Their task was to deploy several hundred soldiers from Illinois to an austere location in Eastern Europe; provide those soldiers with food, fuel, and supplies; and allow them to train in preparation for a notional follow-on deployment to a combat or peacekeeping theater of operations. The operation took place in the Novo Selo Training Area in central Bulgaria in July and August 2004. About 1,300 soldiers, contractors, and host nation workers participated.

The objectives of the exercise were to—

- Test expeditionary force operations by moving troops from the continental United States and U.S. bases in Europe to an austere location and enabling them to conduct quality training.
- Build international relations with Bulgaria.
- Test the Bulgarian infrastructure's potential for supporting future operations involving U.S. forces.

Novo Selo Training Area

U.S. Army Europe's 18th Engineer Brigade served as the higher control for the exercise. Units from the 21st TSC formed Task Force Log and served as the core for the logistics support mission under the command and control of the 37th Transportation Command from Kaiserslautern, Germany. The 212th Mobile Army Surgical Hospital from Miesau, Germany, and the 236th Medical Company (Air Ambulance) from Landstuhl, Germany, provided medical support. The training unit was the 2–130 Infantry Battalion, an Illinois Army National Guard unit.

Local Bulgarian contractors—coordinated by Halliburton Kellogg Brown & Root (KBR) and the U.S. Joint Contracting Command (JCC)—established the life support area at Novo Selo (shown above), consisting of facility tents (chapel; Army and Air Force Exchange Service; dining; and morale, welfare and recreation), sleep tents, and containerized headquarters buildings. KBR also provided services such as operation of the dining facility and upkeep of the life support area.

The Bulgarian economy supplied many products and services for the exercise. One exercise goal was to maximize host nation support and build relations with the Bulgarian Ministry of Defense (BMOD) using a statement of requirements and a North Atlantic Treaty Organization standardization agreement. However, the BMOD had only a few existing civil contracts and could not reliably establish new ones in time, so its contractual support was limited to the provision of bulk fuel, force protection augmentation, military vehicle support, and military liaison officers. The rest of the contracts were established by JCC or KBR. JCC contracted for laundry,

A truck from HHC, 18th Engineer Brigade, makes its way through the Bulgarian town of Mokren.

buses, MILVAN (military-owned, demountable container) and equipment line haul, mobile cell phones, copier service, and hotel rooms. KBR contracted for labor to set up the life support area, maintain the life support area, run the dining facility, and clean the camp.

Bulgaria's infrastructure adequately supported the exercise and proved capable of supporting future U.S. exercises. Sofia and Burgas airports were used without problems, and a new highway that will reduce travel time is under construction from Burgas to the Novo Selo Training Area. The railhead in Zimnitsa was adequate for this exercise, accommodating wheeled and tracked vehicles. The Bezmer air base was used as a maintenance point for repair of UH–60 Black Hawk helicopters and has potential for future use.

Exercise Operations

The 7th Army Training Command, from Grafenwoehr, Germany, brought deployable intelligence support element instrumentation capable of instant, after-action review playback and observer-controller support to the exercise. These, along with radio-operated targetry and sufficient class V (ammunition), provided an outstanding training event for the 2–130 Infantry Battalion and other units in the task force.

The four lanes (convoy situational training exercise [STX], live fire, military operations on urbanized terrain STX, and multipurpose range) provided training opportunities the battalion needed and were effective in improving unit readiness. Novo Selo Training Area could support Abrams tank and Bradley fighting vehicle qualification and company-level combined arms live fire exercises. It could support battalion force-on-force scenarios in future exercises.

The 37th Transportation Command was at the heart of the logistics operation. Its Headquarters and Headquarters Company (HHC) headed Task Force Log and was instrumental in providing classes II (general supplies), IIIP (packaged petroleum, oils, and lubricants), IV (construction and barrier materials), and IX (repair parts) for the exercise. Each unit attached to Task Force Log played a vital role in the overall success of the operation.

Support Operations

Class I (subsistence) and water. KBR provided food and water. The 21st TSC provided a food-service technician to oversee the dining facility operation and ensure that the standards prescribed by Government regulations were met.

All food was brought in from Kosovo, where Army veterinarians were available to inspect food before it was shipped on refrigerated trucks. Many products, including eggs and yogurt, came from Denmark because Bulgaria had only three approved subsistence sources, two for water and one for bread. The Bulgarian economy is largely agricultural, so fruits and vegetables are very affordable. Most sell for $0.40 to $0.80 per kilogram ($0.18 to $0.36 per pound). Fresh Bulgarian produce could be exported easily into Kosovo for veterinary inspection, which generated savings for the Army in buying and shipping the produce and ensured the quality of produce received.

Class II. HHC, 37th Transportation Command, provided all units participating in the exercise with 30 days' worth of general supplies. What could not be acquired before the exercise was purchased at local office supply stores, which allowed the unit to test the local economy and local infrastructure.

Class IV. Lumber was purchased for the 7th Army Training Command to build a training facility. Hundreds of pounds of lumber and 15,000 sandbags went into creating a training facility that provided first-class training support to the 2–130 Infantry Battalion and the 634th Forward Support Battalion, another Illinois Army National Guard Unit.

Class VII (major end items). Class VII items, including M997 ambulances, M149 water trailers, and weapons racks, were borrowed from the 200th Materiel Management Center in Kaiserslautern.

Class IIIP and class IX. HHC, 37th Transportation Command, and its direct support maintenance support team from the 5th Maintenance Company, 51st Maintenance Battalion, 29th Support Group, provided all necessary class IIIP and IX to support the 86 pieces of equipment used for the exercise. Each unit brought initial quantities of its authorized stockage list and prescribed load list to maintain the fleet that it supported. To replenish items used or to acquire additional items,

U.S. and Bulgarian soldiers train together at the military operations in urbanized terrain training site.

derivative DODAACs (Department of Defense Activity Address Codes) were established with Camp Bondsteel, Kosovo, and supplies were shipped weekly to the Novo Selo Training Area using the Red Ball Express. ["Red Ball Express" is the term used by transportation units to refer to shipping supplies to an austere location. It commemorates the Red Ball Express of World War II.]

Class V. Ammunition for the exercise was shipped from the Miesau Ammuniton Depot in Germany and maintained by a team from the 191st Ordnance Battalion under the supervision of Task Force Log. Requisitions from the 2–130 Infantry Battalion and the 7th Army Training Command were filled and reconciled daily to ensure accountability for all live and blank ammunition and pyrotechnics.

Class VIII (medical materiel). Medical supplies and support were expertly managed by the 212th Mobile Army Surgical Hospital, the 160th Forward Surgical Team from Landstuhl, and the 236th Medical Company (Air Ambulance). Together, these doctors and senior medical personnel ensured that all critical areas were covered and all necessary supplies were acquired, transported, and stored.

Transportation. A movement control team from the 14th Transportation Battalion in Vicenza, Italy, ensured that all personnel and cargo moving from the continental United States and Central Europe arrived in Bulgaria safely and efficiently. The team accounted for each item and person and worked with Bulgarian customs officials to ensure seamless movement throughout every phase of the exercise. The movement control team was critical in working with the Bulgarian rail officials to refurbish much of the railcar fleet that was used to transport the equipment back into Central Europe.

Maintenance support. One of Task Force Log's major activities was maintenance of the equipment used during the exercise. Included were vehicles for the convoy STX lanes, maintenance support vehicles, explosive ordnance disposal support vehicles, and vehicles used to push ammunition and logistics support to the training lanes.

The lessons learned during this exercise will play a key role in conducting future exercises and planning for future basing in Eastern Europe. From its experience in Bulgaria, the 37th Transportation Command determined that it could adapt quickly to handle such missions in the future.

The Bulgarian military and civilian communities were eager to work with U.S. forces. Their flexibility helped make the operation a success in both training and international relations. Task Force Log also showed that the Army's expeditionary force concept could be supported logistically and operationally.

ALOG

Captain David C. Chandler, Jr., is the Commander of Headquarters and Headquarters Company, 37th Transportation Command, in Kaiserslautern, Germany. He has a bachelor's degree in marketing from King's College in Pennsylvania and is a graduate of the Combined Logistics Captains Career Course and the Combined Arms and Services Staff School.

Containerizing the Joint Force

BY LIEUTENANT COLONEL JAMES C. BATES, USA (RET.)

Cables are moved into place to lift containers of cargo by crane from the USNS Bellatrix*, one of the Military Sealift Command's eight fast sealift ships.*

During contingencies, 85 percent of all military cargo is moved by commercial sealift. Except for fuel, most of this cargo is stored and shipped in 20- or 40-foot standardized, intermodal containers.

The incredibly simple idea of standardized, intermodal containers has revolutionized the worldwide movement of cargo during the past few decades. Standardization of the size and design of the containers themselves has led to the standardization of all other aspects of containerization as well, including the design of vessels, materials-handling equipment, container-hauling trucks, railcars, and seaports.

The use of containers significantly reduces the number of man-hours required to move and account for the items within the containers. This results in significant savings of time and money. Standardization also has led to intermodalism (the transshipping of cargo using two or more modes of transportation [sea, highway, rail, or air]). Intermodalism and containerization facilitate and optimize cargo transfer without the need for intermediate handling of container contents. Seaports throughout the world; manufacturers of container-handling equipment (CHE); and organizations dedicated to improving container operations, such as the International Organization for Standardization (ISO) and the American National Standards Institute (ANSI), which develop appropriate containerization guidelines, have all adopted and now foster the use of standardized containers.

Why Containers?

Using containers to move sustainment cargo provides significant benefits over alternatives such as breakbulk pallets, cargo nets, and plastic shrink-wrap. Containers provide protection from sun, wind, and rain; can be locked and sealed, thereby preventing pilferage and tampering; are multimodal (the same container can be transshipped easily from a truck to a ship to a railcar or even onto a plane); and can be stacked, thereby doubling, tripling, or even quadrupling the potential storage capacity or movement capacity of a ship or railcar.

Within the civilian sector, approximately 60 percent of all general cargo, which excludes commodities such as fuel, grain, and ore, is moved in containers. This percentage is growing every year. According to a February 1998 report by the U.S. Department of Transportation, lower tariffs, shifting global market demands, and the elimination of trade barriers are changing shipping operations. Containerized trade is growing at an annual rate of 6 percent at U.S. ports and at an even higher rate internationally.

During contingencies, 85 percent of all military cargo is moved by commercial sealift. Except for fuel, most of this is stored and shipped in 20- or 40-foot standardized, intermodal containers. The use of containers allows the military to exploit the extensive commercial containership fleets, the related infrastructure, and the internationally accepted containerization procedures. In addition to using the hauling capacity of commercial containerships, the U.S. Transportation Command's (TRANSCOM's) sealift component, the Military Sealift Command (MSC), has 19 large, medium-speed, roll-on-roll-off (LMSR) vessels, which carry vehicles and containers on wheeled trailers, and 8 fast sealift ships (FSSs).

Container Basics

ANSI and ISO guidelines state that intermodal containers should be either 20 or 40 feet long, 8½ feet wide, and 8½ feet high. Some older containers are only 8 feet high. The current U.S. commercial inventory of containers is almost evenly divided between 20- and 40-foot containers. This means that about two-thirds of all containerized cargo is shipped in the 40-foot containers because they have twice the capacity.

Some newer containers are even longer than 40 feet; some are 45, 48, or even 53 feet long. Nonetheless, they are still moveable by CHE designed for 40-foot containers. Most containers open on one or both ends rather than on the sides. A typical 20-foot container weighs about 4,500 pounds empty; this is called tare weight. It can store or transport an additional 40,000 pounds; this is called payload. Therefore, its total potential weight, known as gross weight capacity, is roughly 45,000 pounds. In comparison, 40-foot containers have a tare weight of 7,000 pounds, a payload of 60,000 pounds, and a gross weight capacity of 67,000 pounds. Unless stuffed with especially dense cargo like ammunition, most containers can be filled completely without exceeding their weight limits. Twenty-foot containers carrying bulk fluids have a payload of 6,500 gallons, while 40-foot containers have a payload of 13,000 gallons.

TRANSCOM owns or leases almost all of the 20- and 40-foot containers used in the Defense Transportation System. MILVANs (military-owned, demountable containers) and SEAVANS (military containers moved by sea) fall in this category. During the large-scale deployments of the past two decades, the Defense Transportation System has used both 20- and 40-foot containers. Most unit-owned equipment and basic loads (expendable supplies maintained at the unit level to sustain the unit during the first few days or weeks of deployment) have been shipped in 20-foot containers, while follow-on sustainment cargo has been shipped in 40-foot containers.

Containers can be placed on wheeled trailer chassis that are pulled by truck tractors over roads. Similarly, this container-on-chassis configuration can be rolled on and off containerships or onto flat railcars and moved by sea or rail. The flat railcars (flatcars) also can transport the containers without the trailer chassis. Depending on their design, flatcars can accommodate containers that are placed singly or stacked two high.

The current U.S. commercial inventory of containers is almost evenly divided between 20- and 40-foot containers. This means that about two-thirds of all containerized cargo is shipped in the 40-foot containers because they have twice the capacity.

Flatracks are containers without standard sides, ends, or tops. They are used to move items that are too big to fit in a standard container. Some flatracks have end walls, some have four corner posts, and others have fixed A-frames on their ends and no sides.

Unlike a flatrack, a containerized roll-in-roll-out platform, known as a CROP, fits inside a container and is used primarily to haul ammunition. CROPs and the ammunition stored on them are removed from containers after the strategic leg of a force movement, such as from the continental United States (CONUS) to a sea port of debarkation (SPOD). CROPs, along with truck tractors, then are used to move ammunition forward. The tare weight of a CROP is about 3,300 pounds.

Some units have their own containers. The Army refers to its unit-owned family of containers as Equipment Deployment Storage System (EDSS) containers. Examples include the interval slingable units (ISUs), containers express (CONEXs), quadruple containers (QUADCONs), triple containers (TRICONs), and other specialty containers used for such purposes as mortuary affairs, refrigeration, or medical services.

A rough-terrain container handler moves a 20-foot container.

ISUs 60 and 90 are 88 inches long, 108 inches wide, and either 60 or 90 inches tall. They are designed to be transported by helicopters, either internally or externally, and can be placed on top of 463L pallets.

Both 20- and 40-foot containers can be placed onboard C–17 Globemaster III and C–5 Galaxy aircraft, but, because of their heavy tare weight, they are not normally transported by air. Instead, 463L pallets are used to aggregate items for storage and air delivery.

A 463L pallet has no walls or top. It measures 108 inches long and 88 inches wide and can hold items stacked to a maximum height of about 8 feet. When shrink-wrap and cargo netting are used, a 463L pallet can hold a gross weight of 10,000 pounds. The tare weight of a 463L pallet is about 300 pounds.

The Containerized Delivery System (CDS) uses containers and parachutes to airdrop equipment and supplies to airborne units and other forces that are widely dispersed on the battlefield. The soon-to-be fielded Enhanced Container Delivery System (ECDS) will be a distinct improvement over the existing CDS. It will use a new, reinforced pallet that is similar to the 463L pallet but is easier to rig, lift, and transport. The ECDS can be moved by forklift or slingloaded. While the current CDS can handle only 2,200 pounds per system, the ECDS is projected to handle up to 10,000 pounds.

Short Distance Movement of Containers

Twenty- and 40-foot standardized, intermodal containers are designed to be moved short distances by various CHE. Examples include gantry cranes, straddle cranes, straddle trucks, rough-terrain container handlers (RTCHs), and crane trucks. Smaller containers, like QUADCONs, TRICONs, CDS, and ISUs, are designed to be moved by forklifts and other types of materials-handling equipment that are not capable of moving the heavy loads in 20- or 40-foot containers.

CHE is used to place intermodal containers on or off trailer chassis and to move containers with or without trailers on or off planes, ships, and railcars. Having the right type and quantities of CHE on hand is essential to maximizing the benefits of containerization. In fact, if the required CHE is not available where and when needed, the use of containers could have an adverse impact on sustainment operations.

How do most tactical units move 20-foot containers? They don’t. Most units, even logistics support units at the tactical level, do not have the necessary CHE on hand to move 20-foot containers. They typically have only forklifts that have a maximum lift capacity of 10,000 pounds. Moving 20-foot containers can become quite a problem, especially in undeveloped theaters or when combat units arrive in theater ahead of the units that are equipped to handle containers. This occurs fairly often because planners have a tendency to deploy combat units earlier than combat service support units during the initial stages of deployment.

The current deployment process usually relies on the use of established ports of embarkation and debarkation. Decisionmakers determine which equipment will be moved by air, land, and sea; they also decide which items will be containerized and if the containers will be placed on trailer chassis and moved by rail or sea.

As CONUS-based units deploy overseas, most, if not all, of their rolling stock (vehicles, trailer-mounted generators, water trailers, etc.) is convoyed to a seaport, where it is driven onto FSSs or LMSR vessels. The cargo and passenger areas of these vehicles normally are fully stuffed with related equipment, such as camouflage netting, fire extinguishers, and tentage. These items are known as "secondary loads." Some unit equipment and supplies are loaded on the same flights as the owning forces when they deploy by air. In other cases, unit personnel will load equipment and supplies into commercial 20-foot containers that have been delivered to the base. These containers (on trailer chassis) then will be hauled by a truck tractor to the marshalling area of the seaport. Depending on the type of operation, containers—either with or without a trailer chassis—may be moved to the seaport by railcar.

Truck tractors and trailer chassis are needed only to move containers; they are not needed when containers are used for storage. Since trailer chassis, like truck tractors, usually are in short supply, straddle trucks or mobile cranes are used to lift containers off the trailer chassis and place them on the ground at the seaport (or on top of other containers if space is limited). When a ship is ready to receive the containers, a straddle truck or mobile crane places them on trailer chassis, and they are hauled by truck tractors to the ship's loading area at a pier. A gantry crane lifts the containers onto the ship. In developed SPODs, gantry cranes also unload the ships. Containers usually are unloaded at the direct support unit level (supply support activities).

Unit sustainment replenishment is transported from wholesale Government warehouses or commercial providers to container consolidation points, where it is placed into 20- or 40-foot containers (usually 40 footers) and transported to the sea ports of embarkation (SPOEs) by highway or rail. Major problems arise however, when modern facilities are unavailable at SPODs or when adequate CHE is not available.

Cranes and RTCHs are the primary military equipment used to handle containers. Both can move 20- to 40-foot containers with gross weights of up to 50,000 pounds over both improved and unimproved terrain. A RTCH is designed to operate on soft soil such as unprepared beaches. It has four-wheel drive and can operate in up to 5 feet of water.

Container Vessels

Besides CHE, another crucial aspect of containerization is the design and operation of the vessels used to transport containers. Several types of ships are used to haul containers. The most common ships in the commercial sector are large, non-self-sustaining ones. The phrase "non-self-sustaining" means that a ship has no onboard cranes to lift containers onto and off of the vessel. Instead, these ships rely on fixed facilities at seaports, primarily gantry cranes, which can reach across the wide beam of the ship, lift the container off the ship's deck, and then place it ashore,

The 98-meter* TSV–X1 Spearhead *is a theater support vessel used to transport troops and cargo on missions that require maximum speed and flexibility. *Photo ©Richard Bennett.*

FSSs, the fastest cargo ships in the world, have a top speed of 33 knots. They have onboard cranes for lifting containers and ramps for uploading or offloading roll-on-roll-off (RORO) vehicles or containers atop trailer chassis.

sometimes directly onto a trailer chassis. Gantry cranes also are used to load containerships.

Floating cranes are used to load and unload non-self-sustaining containerships at ports that do not have gantry cranes. The Department of Defense (DOD) owns 10 auxiliary crane ships that can be used to augment the capability of existing cranes at SPOEs and SPODs.

The newest commercial, non-self-sustaining ships are over 900 feet long, 125 feet wide, and have drafts in excess of 43 feet. Containers are stored both above and below deck, normally without trailer chassis. Containerships can carry the equivalent of 4,000 20-foot containers. A select few ships are even larger and can carry 6,000 20-foot-equivalent units.

In contrast, containerships that are self-sustaining have onboard cranes that load and offload containers. Therefore, they are not as dependent on sophisticated seaports. Combination containerships are vessels that can offload a portion of their containerized cargo but depend on seaport equipment or floating cranes to offload the rest.

FSSs, the fastest cargo ships in the world, have a top speed of 33 knots. They have onboard cranes for lifting containers and ramps for uploading or offloading roll-on-roll-off (RORO) vehicles or containers atop trailer chassis. Combined, MSC's eight FSSs can carry nearly all the equipment needed to outfit a heavy Army division.

MSC's 19 LMSRs, like civilian container vessels, are designed to offload at established SPODs that have developed infrastructure. Each LMSR can carry an entire Army battalion task force, including 58 tanks, 48 other tracked vehicles, and more than 900 trucks and other wheeled vehicles. The preferred vessels for sea transport of unit equipment and military rolling stock are FSSs and RORO ships, while containerships are preferred for sustainment cargo.

One of the newest vessels used in DOD is the Army's theater support vessel, also known as a high-speed vessel. Its shallow draft frees it from reliance on deepwater entry ports. Therefore, it can bypass predictable entry points and access locations unreachable by FSSs, LMSRs, or commercial containerships. One theater support vessel has the capacity of 23 C–17 sorties. It can travel at an average speed of 40 knots, self-deploy over 4,726 nautical miles, and carry 350 fully equipped soldiers. It has a helicopter flight deck and can load or discharge its cargo in less than 20 minutes. TRANSCOM manages the theater support vessels for the Army.

Management of Containers

TRANSCOM, which has the broad mission of managing intermodal containers as they move through the Defense Transportation System, oversees the MSC, the Air Mobility Command, and the Military Surface Deployment and Distribution Command (SDDC). SDDC coordinates the movement of containerized sustainment and unit equipment. It also provides oversight of commercial CHE and commercial surface transportation used to move empty containers from storage lots to military installations for stuffing. SDDC also oversees the highway or rail movement of containers to SPOEs and the movement of containers on vessels from SPOEs to the SPODs. Except for the stuffing of the containers by deploying units or DOD wholesale suppliers, most of the physical work involved in moving containers from CONUS locations to overseas sites is performed by commercial enterprises.

The use of standardized, intermodal containers is simplifying and expediting the movement of sustainment cargo over strategic distances. However, the efficient use of containers requires developed ports, specialized vessels, and CHE that can lift loads that are four to six times heavier than the capacity of the standard 10,000-pound forklift. Properly used, standardized containers can dramatically improve the speed of deployment, employment, and sustainment of joint forces. **ALOG**

Lieutenant Colonel James C. Bates, USA (Ret.), works for Alion Science and Technology and serves as a sustainment planner for the U.S. Joint Forces Command, J–9 Transformation, Distributed Continuous Experimentation Environment, in Suffolk, Virginia. He is a Certified Professional Logistician and a graduate of the Army Command and General Staff College and holds an M.B.A. degree from the University of Hawaii. He can be contacted by email at James.Bates@je.jfcom.mil.

UltraLog: Securing Logistics Information on the Battlefield

by Commander James C. Workman, USN (Ret.)

Sustaining highly maneuverable forces on a rapidly changing, noncontiguous battlefield requires an agile logistics command and control system. But can such a system prevent compromise of its data by a determined adversary?

Ubiquitous information is a cornerstone of many contemporary visions of future warfare. Programs as diverse as the Office of the Secretary of Defense's Force Transformation program and the Army's Future Combat Systems program envision a tight linking of operations, intelligence, and logistics made possible by extensive, shared, and widely distributed information.

Military logisticians generally accept the potential advantages of a future logistics system that is highly networked and that is able to widely distribute real-time, actionable data on the battlefield. However, the survivability of such a logistics information system has not been demonstrated in practice on the battlefield or tested extensively in the laboratory.

With its UltraLog project, the Defense Advanced Research Projects Agency (DARPA) has taken up the challenge of building and demonstrating just such a networked logistics system. Specifically, the UltraLog project's goal is to build an extremely survivable, agent-based logistics planning and execution information system for the modern battlefield. [An agent, or intelligent agent, is a software program that can perform many functions for a human computer user by applying a certain amount of reasoning.] In UltraLog, intelligent agents can be agents that are embedded in a military unit to perform the automated logistics function for that unit, or they can be agents that perform UltraLog system functions outside of military units. The agent society models combat and support units, equipment, transportation networks, and supply chains. [An "agent society" is an information system composed of networked intelligent agents.]

The survivability of a distributed logistics system is based on three primary components: robustness, scalability, and security. Robustness is the ability of a system to continue functioning when one or more of its components are destroyed or impaired. Scalability is the ability of a system to withstand massive increases in size and workload, such as might be encountered in going from peacetime operations to war. Security is the capacity of a system to maintain integrity and confidentiality, even when it is under directed information warfare (IW) attacks. To be successful, future logistics information systems must be robust, scalable, and secure; in short, they must be survivable under battlefield conditions.

In an article in the November–December 2004 issue of *Army Logistician*, retired Lieutenant General Leo Pigaty and I examined UltraLog's robustness and scalability and detailed the process for assessing the military usefulness of logistics data produced when UltraLog was attacked along those two vectors. This article discusses UltraLog's security defenses against cyberattack.

Security Threat Environment

Cyberterrorism is a fact of Information Age life. As a form of asymmetrical warfare, an IW attack may result in potential damage that is completely disproportionate to the level of effort the attacker expends to achieve that damage. Attacks can be launched with

While the developers of this security framework readily acknowledge the impossibility of knowing or foreseeing the universe of potential assaults, UltraLog's defense in depth provides a significant bulwark against known threats.

few resources, without warning, and without regard to geography. They can be originated by pranksters, by adversaries, or by insiders acting either unintentionally or with malice.

IW attacks are almost as varied as the human imagination. However, they can be categorized by the attacker's intent—

- ***Destroy information system infrastructure or data***. Attackers physically destroy computing centers or communications resources or introduce a virus to destroy data.
- ***Intercept sensitive information***. Intruders access operational databases or intercept data moving through the communications pipeline. An adversary, for example, could exploit compromised logistics data to determine a unit's materiel condition, composition, or disposition.
- ***Corrupt or manipulate logistics information***. Logistics transactions and data files are modified, duplicated, erased, or misdirected, potentially disrupting the supply chain and reducing user confidence in the supply system.
- ***Disrupt service***. An adversary floods the system with spurious incoming messages in distributed denial-of-service attacks. Such attacks are designed to effectively paralyze the system by preventing legitimate users from accessing and using the system as intended. This could prevent the processing of logistics transactions and the transmission of requisitions and status information.

UltraLog Security Defenses

Over its 4-year development cycle, UltraLog has evolved a complex matrix of commercial off-the-shelf and uniquely designed security features that provide substantial protection against cyberattack. While the developers of this security framework readily acknowledge the impossibility of knowing or foreseeing the universe of potential assaults, UltraLog's defense in depth provides a significant bulwark against known threats.

UltraLog's security functionality is guided by two overarching concepts: agent system segmentation and dynamically reconfigurable, rule-based protective countermeasures. First, because of its globally distributed nature, UltraLog security is built on a unique framework of distributed trust that segments the agent society. Trust obstacles stand as sentinels between the segments and act to cordon off compromised segments, thus preventing damage from rolling unchecked throughout the system. Second, UltraLog incorporates a tight, policy-based security system. This system comprises a set of rules that is distributed throughout the system. Rules may be flexibly tailored to respond to changes in threat and are strictly enforced.

Policies and rules govern how UltraLog functions and control much of the interaction among agents. Policy is set by subject-matter experts, based on doctrine, and loaded into an UltraLog society. From a logistics perspective, rules might govern stocking objectives at different levels of the supply chain. On the security side, rules might control how many times a user can try to log on before being locked out. Part of UltraLog's strength is large sets of policies and rules that allow the system to modify the rules that are in effect in response to changing conditions.

Other UltraLog security features include—

- ***User access control service***. This feature identifies and authenticates users and protects UltraLog from undesirable corruption caused by unauthorized users accessing the system. A unique user name and user-provided password serve to identify and authenticate individuals seeking to access the system. Access mediators decide whether to grant or deny the requested access and enforce access-control policies whenever someone attempts to enter the system. Once a user is inside the system, access to specific system features is strictly monitored and controlled.
- ***Message protection service***. This mechanism controls the flow of damaging communications by mediating all outgoing and incoming transmissions. It compares messages against policy, stops all disallowed

UltraLog is a distributed, agent-based software architecture that is inherently survivable even in the most hostile environments. It is a resilient system that can protect and adapt itself under the most harsh and dynamic wartime conditions.

traffic, reports violations, and, if warranted, isolates the unit transmitting suspect messages.

• ***Communications security service***. Encryption and digital signature of data in the communications pipeline protect data from compromise or unauthorized modification. Encryption ensures confidentiality, and digital signature ensures integrity of data and serves to authenticate the source.

• ***Monitor and response service***. This provides a framework for monitoring the security condition of the logistics information system. It looks for signs of attack, such as denial-of-service flooding, using data collected from a range of sources; analyzes the data; and selects a course of action determined to minimize the security risk. The framework includes UltraLog-developed sensors to monitor such things as unauthorized service requests or denial-of-service probing; analyzers to evaluate sensor input against decision rules; and a policy-management service that provides the ability to manage the security posture of the system. Examples of responses include simply monitoring intruder activities, deactivating portions of the system under attack, updating security policy (strengthening or weakening it as appropriate), and locking out offending users.

Assessment of Security Defenses

In order to assess the suite of security technologies, an UltraLog society was designed, built, and tested in the computer lab located at DARPA's Technology Integration Center. A battery of over 100 high-speed servers, along with related routers and switches running on a fractional T–3 network connection, were assembled to demonstrate an UltraLog society of over 1,000 military organizations and vehicles.

A scenario was run simulating units of the Army's V Corps fighting a 180-day major regional contingency in Southwest Asia. UltraLog's task was to propagate an operation plan (OPLAN); build an executable transportation plan; plan the sustainment of deploying units; and then, during a simulated execution of the scenario, accept and propagate changes to the OPLAN and revise the transportation and sustainment plans accordingly. All of this was to be accomplished with minimal loss of function while independent assessors attacked the system by such means as cutting or reducing communications, limiting available computer processing and memory, and conducting a variety of IW assaults.

With the testing infrastructure in place, UltraLog security functionality was assessed using a combination of distinct structured experiments and a variety of Red

Team hacker attacks. The attacks were designed to probe the ability of UltraLog's multiple security defenses to preserve the confidentiality and integrity of its logistics functions against real-world threats based on the concept of operations scenario. Emphasis was placed on determining if the defense performed as expected and what the likely impact of the success or failure of the defense would be on the resulting logistics plan. A sample of these experiments follows.

Invalid User Log-in

This experiment tested if an unauthorized user could gain entry into the UltraLog system. It involved a nonexistent user with a bad password, a valid user with a bad password, and a valid user with a bad certificate.

UltraLog successfully prevented the breach of this "first-line" security defense. The logistics functionality of the system was protected by successfully deflecting unauthorized users at the log-in screen. This defense is particularly important in a deployed and distributed system, where it may be relatively easy for an unauthorized user to gain access to a processor running an operational UltraLog logistics system.

Unauthorized Access

A trusted user operating as an enemy agent or working with other malicious intentions can be extremely damaging to military operations. Compartmentalizing access to systems and data is a fundamental mechanism for limiting potential damage. An UltraLog user has defined levels of access to various UltraLog services. In an operational context, these levels of access would be used to define the roles of maintenance and supply technicians, logistics planners, and decision and approval authorities at different levels in the chain of command.

The purpose of this experiment was to determine if a user would be allowed access to functions for which permission had not been granted. A valid user with a valid password logged in and attempted to access several unauthorized services. Access to these services was successfully denied in every instance. The runs were repeated with the user attempting to access resources for which use was authorized. In these runs, the user was able to access the authorized services. These experiments were repeated using authenticating certificates, and again the user gained only the appropriate level of access. Messages were generated advising security managers of the attempt to access unauthorized functions. This combination of successful deflection of access and generation of alerts provided a sufficient defense against unauthorized access.

Disallowed Messages

A series of experiments was performed on controlling the transmission of information and instructions between agents. UltraLog agents, whether physical agents such as a combat or support unit or UltraLog functional agents such as the security manager, are required to perform specific tasks with specific communications requirements. Policy establishes with whom an agent may communicate and the nature of that communication. From an operational perspective, this ensures that communications are limited to what is needed and that commands and instructions flow correctly along the military and logistics chains of command. These experiments demonstrated the following successes—

- ***Agents were prevented from sending messages prohibited by policy***. In the experimental runs, UltraLog successfully stopped the message on the sender's node and the message was not delivered to the intended recipient. Security messages were generated documenting the attempted transmission of a message in violation of policy. Operationally, this defense could be used to isolate military units that display suspicious behavior or to compartmentalize the force structure so that the impact of a rogue agent can be limited to a subset of correspondent agents. ["Correspondent agents" are a group of agents with which the bad agent communicates.]
- ***Agents were prevented from sending disallowed directives***. Messages may contain directives that ask or direct that something be done. Policy determines which directives an agent may use and which are prohibited. For example, it might be inappropriate for a signal company to direct that a transportation company move a tank from one location to another. Based on the experimental data, UltraLog's access control service on the send side enforced policies that specify the directives an agent is allowed to send. Operationally, this prohibits a military unit from issuing orders without appropriate authority.
- ***Receivers rejected disallowed directives***. This experiment examined the situation that occurs when a compromised agent successfully sends a message with disallowed directives and determined if the receiving agent detected and rejected the prohibited message. In the experimental runs, the message access control service successfully prevented agents from receiving messages containing disallowed directives.
- ***Receivers rejected disallowed messages***. This experiment examined what happens when a compromised agent successfully sends a disallowed message and determined if the receiving agent detected and rejected the prohibited message. The experiment demonstrated that UltraLog agents detected, rejected, and reported when messages disallowed by policy were received. Operationally, this defense effectively isolated a military unit from a rogue

As a group, the tested UltraLog defenses provided significant protection from cyberattack. For the experiments conducted, all UltraLog defenses were rated "green" (acceptable) for completely or nearly completely defending against the intended attack.

agent trying to transmit damaging instructions or orders.

• ***Unsigned or improperly signed messages were rejected***. Operational decisions rely on the accuracy of information contained in incoming transmissions. In UltraLog, information integrity is ensured in part by the digital signature that accompanies incoming messages. This experiment assessed whether or not target agents accepted or rejected unsigned messages. Policy was modified by Red Team hackers so that the agents of one unit transmitted messages without signatures. UltraLog agents successfully rejected 731 of 731 unsigned messages. UltraLog successfully defended against agents receiving and accepting messages of questionable origin. From an operational perspective, logistics functions were protected.

Unsigned or Improperly Signed Code Modules

It is essential that code that is introduced into a deployed and functioning information system be from a trusted source. The ability of an adversary to insert malicious code can be extremely damaging; in UltraLog, this ability could completely compromise operational and logistics functionality. Only code that contains the digital signature of someone known and trusted is supposed to be accepted and loaded into UltraLog. This experiment demonstrated that UltraLog was able to prevent the loading of code that was not accompanied by a trusted digital signature.

Adaptable Security Posture

In the event of multiple security violations, UltraLog is designed to sense the increased security threat environment, increase the threat condition level, and modify security defenses appropriately for the new threat environment. A series of experiments was conducted involving multiple attacks against the system. These attacks included multiple invalid logins, invalid and unsigned message transmissions, and invalid code insertions. In each case, UltraLog detected and prevented the disallowed activity, generated alert messages, and increased the system's security posture in response to the heightened threat. The policy enforcement infrastructure also rebuffed denial-of-service attacks by limiting the system interfaces available for attack.

Final Analysis of UltraLog Security

As a group, the tested UltraLog defenses provided significant protection from cyberattack. For the experiments conducted, all UltraLog defenses were rated "green" (acceptable) for completely or nearly completely defending against the intended attack. The overall security functionality of UltraLog was rated green in recognition that significant portions of the threat envelope had been effectively secured.

Improvements over previous years were noted in the areas of preventing unauthorized access to information, securing interagent communications, preventing malicious code insertion, and preventing unauthorized operations. Other enhancements demonstrated that the security services are scalable to support large distributed systems. Progress was made in controlling unauthorized access to data and processes operating in system memory.

Progress also was made in the system's ability to manage security policy and respond to changes in the threat environment. This included the development of templates that enhance the ability of policy administrators to specify and modify enforceable security policies. Overall, UltraLog's security policy framework and the specific policies tested successfully deflected hacker attacks.

As it nears the end of its development cycle, UltraLog has made significant strides in building a security infrastructure sufficient to protect distributed agent-based applications. Clearly, based on assessment-derived data, the integrity and confidentiality of the highly distributed logistics information systems envisioned for the modern battlefield can be protected—even from a determined adversary. **ALOG**

Commander James C. Workman, USN (Ret.), is employed by Los Alamos Technical Associates, Inc., in Sterling, Virginia. He holds a B.S. degree in financial management from the University of Oregon and an M.S. degree in financial management from the Naval Postgraduate School. Commander Workman served 20 years in the Navy Supply Corps, culminating in joint tours at the Office of the Secretary of Defense and the Defense Logistics Agency.

Transportation Challenges in Afghanistan

BY FIRST LIEUTENANT MARY K. BLANCHFIELD

The mission of 10th Mountain Division (Light Infantry) from Fort Drum, New York, in Afghanistan during Operation Enduring Freedom IV was to deny sanctuary to and destroy Al Qaeda and Taliban forces operating in Afghanistan. Transporters of the 10th Forward Support Battalion (FSB) were charged with using all available means to provide, as quickly as possible, the supplies the warfighters needed to sustain their mission. This was a challenging mission.

Because Afghanistan has been at war for over 20 years, its economy has been extremely deprived, hindering the development and maintenance of its transportation network. Slightly smaller than Texas, Afghanistan has a road network of only 21,000 kilometers, 18,207 kilometers of which are unpaved (compared to approximately 123,000 kilometers of state-maintained roads in Texas). The poor highway system, coupled with the rugged Hindu Kush mountains, makes surface traffic a transportation challenge that significantly affects mission accomplishment.

Operational Overview

During Operation Enduring Freedom IV, Kandahar Airfield in Afghanistan hosted three transportation elements. The first element, the transportation cell from the 10th FSB Tactical Operations Center, consisted of a transportation lieutenant; two noncommissioned officers (NCOs) with military occupational specialty (MOS) 88N, transportation management coordinator; and two enlisted soldiers with MOS 88M, truck driver. The 88Ns were organic to the 10th FSB, and the 88Ms were attachments from D Company, 710th Main Support Battalion (MSB). Together, they coordinated inbound and outbound surface movements.

The second element, the central receiving point (CRP), was part of the FSB. The CRP had six stake-and-platform (S&P) trucks and three family of medium tactical vehicles (FMTV) trucks that were operated by 18 88M truck drivers who were attached from D Company, 710th MSB. A first lieutenant and a staff sergeant led the CRP detachment. This slice element was necessary because the FSB did not have an organic truck platoon. The CRP's primary mission was to receive Air Force 463L and DHL pallets of materiel and deliver them to destinations at Kandahar Airfield such as the ammunition supply point, the class I (subsistence) facility, or the multiclass warehouse. (DHL is a commercial shipper that delivers high-priority items, mail, and fresh fruits and vegetables to Afghanistan.)

The third element was the movement control team (MCT). It consisted of a container management team, a rough-terrain container handler (RTCH) team, a team of load planners, and an air movement team, all of which were subordinate to the 330th Transportation Battalion based at Bagram Airfield. The MCT's mission included joint movement center (JMC) request prioritization and container management. A JMC request is the document used by the joint movement center to prioritize, track, and ensure proper planning of cargo requirements. Since the MCT worked closely with the Air Force, it was collocated with the arrival and departure airfield control group.

All three of these transportation elements worked closely at Kandahar Airfield. Because of force protection concerns, Army transporters had few, if any, missions with their own assets outside the Kandahar Airfield perimeter. Afghanistan is still too dangerous a place for supplies to be moved by military ground vehicles. The Army did not use its own vehicles to deliver supplies because adequate military police support was unavailable and inadequate force protection would put soldiers in unnecessary danger and the delivery of supplies at risk. Therefore, local drivers delivered supplies to the forward operating bases (FOBs).

Tactical Deliveries

Surface transportation missions on Kandahar Airfield were limited. The Air Force offloaded the airplanes carrying supplies and brought the cargo to the central receiving point. Then the CRP delivered the cargo to a variety of locations at the airfield. Most items, except for ammunition and fresh food, were delivered to the multiclass warehouse by S&P trucks.

Doctrinally, this was not a typical CRP mission. The CRP should have been the breakdown point, but Kandahar Airfield did not have the space or personnel to break down all the pallets. Normally, cargo brought to the CRP would have been broken down and the customers would have picked up their supplies. However, Kandahar Airfield was designed primarily for passenger transport, not cargo, so all supplies that arrived by air and surface were delivered directly to the customer instead of to the CRP.


Rough-terrain container handlers like this one are used to reposition containers so that inspectors can check the seals before the containers are brought onto the base.

FMTV trucks frequently were used to carry humanitarian aid and medical supplies. Frequently an FMTV truck with a ring mount for a .50-caliber machinegun served as a gun truck on civil affairs missions. Soldiers from the medical, civil affairs, psychological operations, and military police companies and a Romanian infantry guard force traveled to neighboring villages to provide humanitarian aid and medical assistance and to deliver food and blankets.

Providing humanitarian aid was secondary to supporting combat operations. If supplies could not get to the warfighter by rotary- or fixed-wing aircraft, the CRP had to be ready to deliver the supplies wherever they were needed.

"Jingle Truck" Deliveries

Since the CRP did not push supplies forward, the military contracted for host nation delivery trucks, known as "jingle trucks" because of the decorative metal tassels hanging from the bottom of the truck frames that jingled when the trucks moved. The FSB contracted these trucks through two Afghan Government officials. The NCO responsible for these contracts was known as the "jingle man."

The contract price was based on the destination and the type of truck used. Fuel tankers and trucks that could carry 20- and 40-foot containers were available. Although serviceable, these trucks would not pass standard U.S. specifications.

Units needing supplies to be pushed to them at outlying FOBs sent requests to the FSB. The FSB, in turn, negotiated delivery contracts with Afghan Government officials. The units were responsible for loading the trucks and guarding the drivers while they were on Kandahar Airfield. They also provided an inventory of all the supplies that were to be transported in each truck. A memorandum with a copy of the inventory attached to it was given to the driver so the truck would be allowed to enter the FOB. This gave personnel at the FOB an accurate inventory of the contents of inbound trucks so they could monitor pilferage.

Since reliable in-transit visibility was not available in Afghanistan, FSB personnel and Afghan Government officials needed a receipt to verify that the sup-

Trucks contracted to transport supplies are known as "jingle trucks" because of the sound their decorations make.

plies were delivered to the proper FOB. When the customer at the FOB received the supplies, he signed the driver's memorandum and returned it to him. The delivery charge was added to the invoice only after the driver returned with the signed memorandum. The Government officials were paid monthly for all completed missions. The transportation cell NCO in charge (the "jingle man") pushed an average of 90 trucks a month to the various FOBs.

Inbound Shipments

Another FSB mission was inbound surface movement, which was managed by two enlisted soldiers. Inbound trucks were brought to Kandahar Airfield every morning by the transportation cell and inspected by a Romanian guard force of 10 infantrymen. Military police dogs searched the trucks for improvised explosive devices (IEDs). If the dogs did not detect any IEDs, the Romanians searched the trucks and drivers for contraband. The RTCH team, which consisted of the RTCH operator, an NCO, and two ground guides, was also present during this process. When two 20-foot containers were loaded on a truck, they were positioned with their doors facing one another. The RTCH operator would move one container to permit the transportation cell to check the seals applied by the shipper. If the seals were not visible, the RTCH operator would turn the container so the transportation cell could verify that the correct seal was on that container.

Strategic Logistics

When determining delivery priority under current Army practice, delivery to a combat zone always takes precedence over delivery to a nondeployed unit in the continental United States, and a deadlined pacing item (mission-essential piece of equipment) takes precedence over zero-balance replenishment items (parts that are not currently in stock). The priority of the part determines the mode of transportation. A critically required repair part can be ordered and shipped by a contracted commercial carrier such as DHL. In Afghanistan, most class IX (repair parts) was received from the United States. Class IX deliveries were prioritized based on the mission. Parts were normally consolidated in containers at one of several stateside depots. Most repair parts were sent by air to Kandahar Airfield via Germany. Low-priority parts may have been shipped by sea to the port of Karachi in Pakistan. However, most class IX was flown into theater. The priority of an item determined whether it was shipped by military or commercial air. Military air was slower because of the bottleneck that occured at the transfer point at Manas Airfield in Kyrgyzstan. Military aircraft flew to Manas, but fewer connecting flights departed to Kandahar, which created a chokepoint that generated a backlog. To address this problem, the FSB transportation cell prioritized flights out of Manas by submitting JMC requests for needed parts through the MCT.

Class I (subsistence) was distributed primarily from the prime vendor based in Bahrain. Most class I was shipped through the Arabian Sea in 20-foot containers. After it was disembarked at the port of Karachi, it was stored in a holding area according to purchase order number. (A purchase order could consist of 2 to 15 containers.) The port shipped the class I by purchase order when supplies were called forward. Pushing items by purchase order caused problems when only one item or container was needed and the entire purchase order was shipped. The class I yard at Kandahar Airfield had limited space, which reduced its capacity for containers, so holding excess containers strained an already austere capability.

The port became a holding area. However, problems with in-transit visibility and insufficient jingle trucks to move supplies created a bottleneck at the port, which caused a backlog of containers. Frozen food storage was another problem. The refrigerated containers (reefers) required power to keep the food at a subfreezing temperature for the journey to Kandahar Airfield. Yet few generator sets ("gensets") were available to provide power, and prime power needed to operate the reefers at Kandahar Airfield was limited. As a result, if a reefer arrived at the airfield without a source of power (either prime power or generator power), the class I staff had to keep the genset used to power it during shipment. This slowed down the transportation process and added to the backlog at the port. These problems will be alleviated with the new cold storage facility that was built in 2004 and with increased prime power. Fresh fruits and vegetables were shipped twice weekly by commercial air.

Class IIIB (bulk petroleum) was pushed from refineries near Karachi. It was transported to Kandahar Airfield in 10,000-gallon jingle fuel tankers. The biggest concern with fuel delivery was force protection. Fuel trucks make good targets for terrorists. However, an extensive inspection of fuel trucks entering the airfield reduced the IED risks.

Challenges

The FSB encountered several difficulties at the tactical level. For instance, in-transit visibility of trucks en route from Kandahar Airfield to the various outlying FOBs was limited, and the time it took to get to the different FOBs varied. The FSB had no way of knowing if the truck arrived until it had returned to Kandahar, which could be up to 2 weeks later. The jingle trucks also had no license plates, so they were hard to differentiate. If a truck was attacked, there was a report stating that a jingle truck had been attacked, which was vague since all trucks in Afghanistan are referred to as jingle trucks. After the report came in, it took time to figure out which truck was hit, which FOB it was supplying, and what emergency resupply actions were required. This had a significant impact on the reliability of supply deliveries.

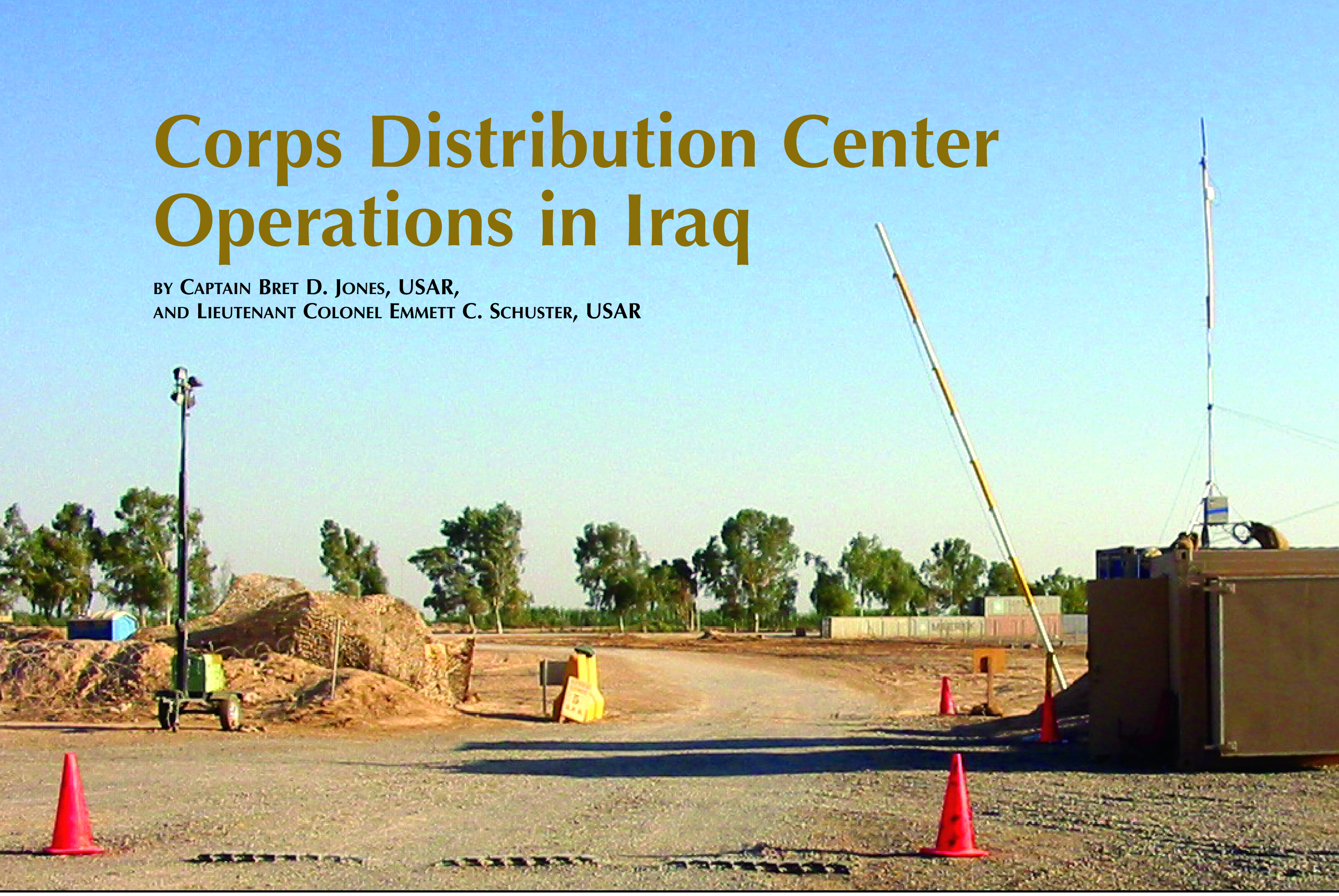
Because of the lack of in-transit visibility and the inherent dangers of a combat zone, the terms of U.S. military contracts with the Government officials were usually generous. The contracts often made it difficult to enforce the timely arrival of supplies. For example, by contract, a driver may have had 4 days to deliver supplies to a designated FOB, when the trip took only 7 hours. This time difference was a buffer in anticipation of possible problems, such as maintenance troubles and attacks by anticoalition militias along the way.

Another problem was pushing fuel forward. In Afghanistan, there was no standard method or equipment for cleaning fuel tankers properly. When a tanker truck was requested, there was no guarantee that it could carry fuel without contaminating it. Fuel transported in the vehicles was often too dirty to be used at the forward bases. As a result, aviation-grade fuel had to be slingloaded to the FOBs.

During the 10th Mountain Division's deployment, the transportation cell, the CRP, and the MCT quickly adapted to the constraints imposed by long supply lines over difficult terrain. This flexibility was evident in the judicious use of host nation vehicles, attention to safety details, and the optimization of on-hand organic assets. Therefore, critical supplies were delivered in a timely manner, both to the forces at Kandahar Airfield and at the outlying FOBs. This, in turn, proved crucial to the success of the mission to support Operation Enduring Freedom IV **ALOG**

First Lieutenant Mary K. Blanchfield is the Assistant S–3 for the 10th Brigade Support Battalion (BSB) at Fort Drum, New York. She was the Movement Control Officer for the 10th FSB in Kandahar, Afghanistan, when she wrote this article. She has a bachelor's degree from Stetson University in Florida and is a graduate of Officer Candidate School and the Transportation Officer Basic Course.

A tanker prepares to deliver fuel to forward operating bases.



Corps Distribution Center Operations in Iraq

by Captain Bret D. Jones, USAR,
and Lieutenant Colonel Emmett C. Schuster, USAR

Our unit, the 319th Corps Support Battalion, arrived at Logistics Support Area (LSA) Anaconda in Balad, Iraq, in February 2004 to support Operation Iraqi Freedom II. In peacetime, the battalion is assigned to the 172d Corps Support Group (CSG), U.S. Army Reserve, headquartered at Broken Arrow, Oklahoma. When deployed, the 172d CSG (and thus our battalion) is assigned to the 13th Corps Support Command from Fort Hood, Texas. In Iraq, our battalion was tasked to take over area support functions, including management of general support and direct support class I (subsistence), nondivisional direct support, LSA water production and distribution, and operation of the corps distribution center (CDC) at Balad. Although the previous unit had done a good job in setting up the CDC under very bad conditions, we quickly noticed that improvements could be made in several areas.

Logistics Flow in Northern and Central Iraq

Materials arrive in the CDC from the theater distribution center at Camp Doha, Kuwait, and from the arrival and departure air control group in Balad. The CDC has a reception point, which screens incoming traffic, and three main yards: the multiclass yard, which handles classes II (clothing and individual equipment), IIIP (packaged petroleum), IV (construction materials), VI (personal items), and IX (repair parts); the general support class I yard; and the onward movement yard. The CDC arrival and departure movement control team (MCT) controls traffic and documents the cargo moving through the CDC. All traffic enters the CDC through the reception point and exits through the departure point checkout station.

CDC Reception Point

Cargo processing begins at the CDC reception point. This step is critical to all follow-on processing. The CDC receives sustainment cargo and pushes it forward to the appropriate satellite node. When we arrived in Iraq, the entrance to the CDC was located next to the multiclass yard and convoys were staged in an area outside of the yard. Some convoys had to wait for long periods of time to be processed, often because line haulers arriving in the yard had to wait for others to clear the CDC to download their cargo. Pallets and

Cargo processing begins at the corps distribution center's reception point. This step is critical to all follow-on processing.

containers blocked other pallets and containers, while liaison officers from the supported units prioritized what they wanted loaded next. This caused control and security issues because cargo was being downloaded and routed on the spot while other vehicles were forced to wait to come into the yard. The reception team also stages convoys and vehicles, so, at any given time, 100 or more vehicles from three or four countries were staged in the CDC.

Initially, the inbound radio frequency identification (RFID) tag interrogator was perched on top of the CDC control building near the sustainment cargo, a position that could adversely affect the tags on the cargo stored in the area. Multiple pinging of the RFID tags on containers that sit in the arc of an interrogator depletes the tags' batteries and can cause an information jam in the interrogator system. To prevent these problems from occurring, we relocated the front gate and the inbound interrogator to the front of the staging area so they would operate more efficiently and save tag battery life. We also moved a team of soldiers and a civilian MCT to the new front gate to log in all types of packs, RFID tags, pallet ID numbers, and CONEX (container express) numbers. The moves improved security and control and, most importantly, improved the overall reception operation.

Multiclass Yard

Our multiclass yard is broken down into several different areas. One is the mixed-pallet and frustrated cargo area. It is operated primarily by soldiers from the 51st Maintenance Battalion's 574th Supply Company from Mannheim, Germany, with augmentation from Halliburton Kellogg Brown & Root (KBR). Their job is to receive packs that are mixed or frustrated. Mixed packs are CONEXs or pallets whose contents have multiple Department of Defense Activity Address Codes (DODAACs) and are destined for several different supply support activities (SSAs). Packs that have items with multiple DODAACs but are headed to the same SSA are not considered mixed. Automated logistical specialists (military occupational specialty 92A) break down the mixed pallets and segregate their contents on pallets to be shipped to each of the many logistics nodes served by the CDC. If enough cargo for one location is received in 24 to 48 hours, a "pure" 463L pallet is shipped. Partial pallets are sometimes shipped so critical supplies will reach their destination on time.

Sometimes a pallet is labeled "pure," but when it is broken down at the receiving SSA, it is found to contain items that belong to another SSA. When that happens, the items must be shipped back to the CDC as retrograde cargo. In effect, cargo is shipped several times by the same transportation units. To avoid this, greater effort should be made to increase the number of pure pallets shipped to the theater.

Another part of the multiclass yard is designated as the "retro" area. This area is run by the 574th Supply Company, augmented by the 302d Cargo Transfer Company, an Army Reserve unit from Fort Eustis, Virginia, and KBR. Retrograde cargo from the satellite SSAs is backhauled to the CDC, where it is determined to be serviceable, unserviceable, or misdirected. In the first few months, a lot of cargo was shipped back and forth among SSAs, the CDC, and the theater distribution center because the retrograde cargo was not properly processed and labeled through the Standard Army Retail Supply System (SARSS). For example, when an unserviceable major assembly was retrograded to Camp Arifjan, Kuwait, or the theater distribution center, often the original materiel release order and military shipping label would still be on the

Retrograde cargo, much of it in improperly processed and labeled containers, sits in the retrograde area of the multiclass yard. Some of the containers have multiple labels all over them (inset).

container. When this happened, the unserviceable major assembly was shipped back to the CDC. Because about 1,000 major assemblies pass through the CDC each month, we missed some of those that were labeled improperly, and they were sent back to the SSA that had retrograded them 2 weeks earlier.

One thing we did to stop these reshipments was enforce the procedure for processing retrograde through SARSS. We notified the SSAs that we would no longer receive undocumented or unprocessed retrograde cargo starting 1 July 2004. By the end of July, the quantity of undocumented or unprocessed retrograde cargo had dropped dramatically.

A redistribution warehouse with an active SARSS was set up in Balad in an effort to save time and money. SSAs can ship serviceable or excess stocks there rather than back to the warehouses in Kuwait. "Orphaned" and found-on-installation stocks (items on hand but not on any unit's hand receipt) can be sent to the redistribution warehouse for processing rather than to the CDC.

The main area of the CDC multiclass yard is devoted to cargo lanes. The 7th Corps Support Group's 71st Corps Support Battalion from Bamberg, Germany, and the 372d Cargo Transfer Company from Fort Bragg, North Carolina, had done a good job setting up six lanes. Each lane is designated for use by certain SSAs or service areas. Now, empty trailers are staged in the lanes, and incoming cargo is transloaded from sustainer trucks to the trailers in the appropriate lane.

Onward Movement Yard

As part of the new CDC operation plan, we stood up a loaded-trailer staging area that we call the CDC onward movement yard. When trailers are fully loaded and documented, they are staged in this yard. This helps the transportation units that are building convoys by allowing them to come in and hook up to the appropriate trailer without having to wait to be uploaded.

Because this new setup works so well, we are now preloading class I. We know that 10 to 20 class I trailers are needed each day, so we try to keep as many of them staged as possible. This has increased the efficiency of the yard even further. Moving cargo directly onto trailers dramatically cuts the time required to process a convoy. Before, it took 6 to 12 hours to process a convoy because CONEXs and pallets had to be moved to make space for new ones coming in. Now, it is just a matter of moving cargo from one trailer to another. Because of the reduced processing time, transportation units spend less time at the CDC and more time on the road. They now can move more cargo without more equipment or personnel. There is less wear and tear on equipment, and, since most of the cargo is never set on the ground, there is less gravel and dirt on the pallets and in the trailers. Cargo is now being handled only once instead of multiple times.

Automation

We knew we needed to automate the CDC if we were ever to have an economical operation. The number of misdirected shipments and reshipped commodities was just too high. Operating independently of other logistics nodes was costing us too many resources, so we decided that we could justify the costs associated with improving our communication system.

We now have two Transportation Coordinator's Automated Information for Movements System II (TC–AIMS II) machines in the CDC that we use to burn tags and print MSLs. We also have a mobile Deployment Asset Visibility System (DAVS) that we use to interrogate RFID tags without a hard connection to the Internet or a power supply. We use it to "look inside" a container to get the consignee information

without breaking a lock or seal. When we need to find a certain RFID tag in our large yard, the DAVS scans and captures information on all the tags in a specific area. This is particularly helpful because RFID tags sometimes are placed where they are hard to find and may be overlooked.

Since we arrived in Iraq, we have been able to obtain an Automated Manifest System-Tactical (AMS–TAC) for the CDC. With it, we can receive and ship cargo, burn RFID tags, and maintain in-transit visibility and total asset visibility (ITV and TAV) of the shipped items. Before AMS–TAC, RFID tags or pallet IDs on a mixed pallet often became disassociated with the transportation control numbers (TCNs) on the pallet when we broke it down. This did not mean that the cargo was lost, but tracking it was a problem. Disassociated RFID tags had to be cross-referenced manually with the correct TCNs, which was extremely complicated and time consuming. Those factors, plus the likelihood of human error, rendered the manual effort unproductive.

With AMS–TAC, the TCNs of items used to build pure pallets are scanned, and, when the tag is burned, the data go to the ITV server in Germany. When a shipper searches global transportation network (GTN) or ITV Web sites for the TCN, the new associated TCN and tag number, or "bumper number," is displayed.

Automated systems work well under ideal conditions, but we soon learned they do not work well in dusty Iraq in the middle of July. We are not discouraging the use of automation; rather, we are pointing out that automation has its limits, and smart business practices must be used to keep things going when automation fails.

Automation runs on electricity, and it is a day-to-day battle to keep the generators running at the CDC. Dust and heat take a heavy toll on air filters, oil, and hydraulics. Scanners tend to operate for only 20 to 25 minutes when the temperature is above 98 degrees Fahrenheit.

The condition of the pallet or CONEX labels is very important. All packs shipped must have a Department of Defense [DD] Form 1387 (military shipping label [MSL]) and a DD Form 3148–1A (issue release/receipt document [IRRD]), or similar document, on them. (See Army Regulation 710–2–1, Using Unit Supply System Manual Procedures, for more information on labeling.) The MSL contains the TCN,

When trailers are fully loaded and documented, they are staged in the CDC onward movement yard. Trucks come into the yard and hook up to the appropriate trailers without having to wait to be uploaded.

the number of items in the pack, and the consignee. The materiel release order, which is generated by SARSS or another AMS–TAC, contains the document number, national stock number, routing identification number, unit of issue, quantity, commodity, requirement code, and unit price. If the labels have extraneous marks on them, the AMS–TAC scanners have a hard time reading them. Retrograde cargo is processed manually each day, but the barcodes on those labels are needed to automate the documentation.

Because currently published unit DODAACs are used to determine where cargo goes, it would be helpful if the correct DODAACs were included on both the MSLs and the IRRDs. Placing these documents where they can be scanned easily from the ground while the packs or items are sitting on a flatbed trailer also would dramatically improve the ITV and TAV of cargo.

RFID tags get damaged, batteries run down because of extensive pinging, and some tags are not burned properly. Also, when the electricity goes, so does the interrogator. We may go hours or even days before we can fix it ourselves or get someone to fix it. We do not stop our operations during this time. We still record every piece of sustainment cargo passing through the CDC. To prepare for inevitable automation failures, we developed a manual system to track cargo. As cargo comes into the yard, we fill out an improvised form we call a "drop placard." On it we record all of the necessary ITV data, as well as information ITV cannot capture, such as the name and type of the hauling unit.

Once the cargo is processed into the appropriate lane, the drop placard is taken to the MCT at the front gate, and they produce an inbound report of pertinent data. When a trailer is completely loaded, we tag it with a "pull placard." This tells the trailer transfer point team or the KBR tractor team to pull that trailer to the CDC onward movement yard. When transportation units arrive to haul the trailers, the departure point MCT uses the pull placard to produce an outbound report of cargo that has left the CDC. We also use the pull placard to record the classes of supply that are loaded on specific trailers. Twice a day, we record, by unit supported, location, and class of supply, what has been received in the CDC; what is staged; and what has left. We currently record each RFID tag and pallet ID number on drop placards and pull placards. We then turn those placards over to the inbound and outbound MCTs to be entered into a spreadsheet.

AMS–TAC is a very handy and capable system, but it is menu driven. This means that it looks for a certain sequence of barcodes. For example, in the receiving mode, the AMS–TAC barcode scanner first seeks the TCN of the unit that shipped the scanned cargo to that location. It then asks for various other barcodes and, eventually, for the document number barcode.

We are developing a process that will use personal data assistants (PDAs) with built-in scanners to read these additional barcodes. We want to use the PDAs to build a quick list of RFID tag and pallet ID numbers, which will increase the accuracy and productivity of our on-site cargo recordkeeping. The PDAs also will read nonstandard barcodes similar to those used by commercial shippers. We often receive packages that have commercial barcodes on them, and it would be helpful to be able to cross-reference those barcodes with standard DOD barcodes.

Communications

Automation does not work well without communications. When we arrived in Iraq, we had only a single-channel, ground and airborne radio system (SINCGARS) that worked some of the time. We had no phone, Internet connection, or handheld radios. Keeping track of critical materials-handling equipment and orchestrating movements and operations in the yards were impossible.

One of our first tasks was to get phones in the multiclass yard and the class I yard. Although this proved to be a challenge, we eventually were able to get a very small aperture terminal (VSAT), which is a small earth station for satellite transmission. With the VSAT, we can receive and transmit CDC-related data to everyone, which is a great boost to our operation.

The CDC is a very busy area. At any given time, we may have 4 or 5 rough-terrain container handlers and 10 to 15 forklifts working in the yards and containers and pallets are being moved around constantly. In such a setting, land-based communication lines do not hold up very well. Even when the land lines are buried, they eventually are cut somehow. One way that we are working around this problem is by using the Combat Service Support Automated Information System Interface (CAISI). This system gives us the ability to run a wireless network to the various operations nodes in the CDC yard. Currently, we are trying to get a CAISI client module for the ammunition supply point (ASP). However, since we have already assigned the nine Internet Protocol (IP) addresses allocated to us by the VSAT system administrators, we currently do not have an IP for the ASP CAISI.

CDC Soldiers

The soldiers in the CDC come from both the Active and Reserve components and have various military occupational specialties. Most of them had no specific training for this operation before their deployment because no one has ever done what we are doing here. Our processes are new. We have improvised by creating forms and using some equipment for purposes other than those intended in the original design. We operate in all kinds of weather on an installation that is one of the most frequently attacked installations in the theater. Everything is dirty, usually hot, and often broken. In many ways, ours is a thankless job, but our soldiers get the job done, and they do it better each day.

CDC Wish List

Based on our deployment experiences so far, we have compiled a "wish list" of things we think would improve our operations. Here are some of the items on that list—

• Some of the packs that come into the CDC look like travel trunks that have been riding around on a train for awhile—they have labels all over them. There should be one global label with barcodes that can be read by any scanner. An alternative would be scanners that can read any barcode. Both labels and scanners should be constructed so they will survive in hot, dusty, and windy environments.

• Everyone understands and plays by the same logistics rules, so all major logistics nodes should have the same types and quantities of equipment such as materials-handling equipment and communications sets and outfits.

• A single collection point for the immediate area would enhance the overall logistics operation. Currently, transporters have to stop at several outlying logistics nodes, which delays shipments and frustrates cargo. Units sometimes refuse to download cargo because it is not theirs or they do not want it. These deliveries needlessly put the drivers and their trucks at risk.

• Transportation organizations with different equipment create logistics constraints. Civilian tractors and trailers do not work well with their military counterparts. We need more consistency of equipment and organizational structures.

The CDC has come a long way since the 319th Corps Support Battalion arrived at LSA Anaconda. Four separate Army units, a team of marines, and at least three contractors operate military and civilian equipment in the CDC. Together, we have processed more than 15,350,000 pieces of cargo weighing over 800,000 tons (or 1,400 to 1,500 truckloads each week) while five divisions and many nondivisional units were deploying and redeploying. Most cargo, frustrated or not, is cleared out of the CDC in 12 to 36 hours. Because we serve over 160,000 military and civilian personnel, we are sometimes the object of both gratitude and scorn. Although we are operating at about 98-percent accuracy (measured by the amount of cargo processed versus documented misdirected shipments attributed to the CDC team), we expect the negatives to decrease and our systems to improve even more as we acquire better facilities. Our focus now is to achieve 100-percent accuracy, and do it faster, cheaper, and safer than ever before. **ALOG**

Captain Bret D. Jones, USAR, is the Transportation Officer in the Support Operations Office of the 319th Corps Support Battalion, 172d Corps Support Group, which is currently deployed to Balad, Iraq. He has a bachelor's degree in air transportation/airport management from Northeast Louisiana University. He is a graduate of the Transportation Officer Basic and Advanced Courses and the Combined Arms and Services Staff School.

Lieutenant Colonel Emmett C. Schuster, USAR, is the Commander of the 319th Corps Support Battalion, 172d Corps Support Group, which is currently deployed to Balad, Iraq. He has a bachelor's degree in entomology from Texas Tech University and a master's degree in health services administration from the University of Kansas. He is a graduate of the Field Artillery Officer Basic and Advanced Courses, the Combined Arms and Services Staff School, and the Army Command and General Staff College.

Improving RFID Technology

BY JEFFREY D. FEE AND ALAN SCHMACK

Since 1993, the Army has been pursuing the use of active radio frequency identification (RFID) tags to gain in-the-box visibility for both deploying equipment and sustainment stocks. Use of RFID tags was a response to lessons learned from Operations Desert Shield and Desert Storm in 1990 and 1991. Since then, growth in the use of tags clearly shows that RFID has become a very important part of today's Total Asset Visibility plan.

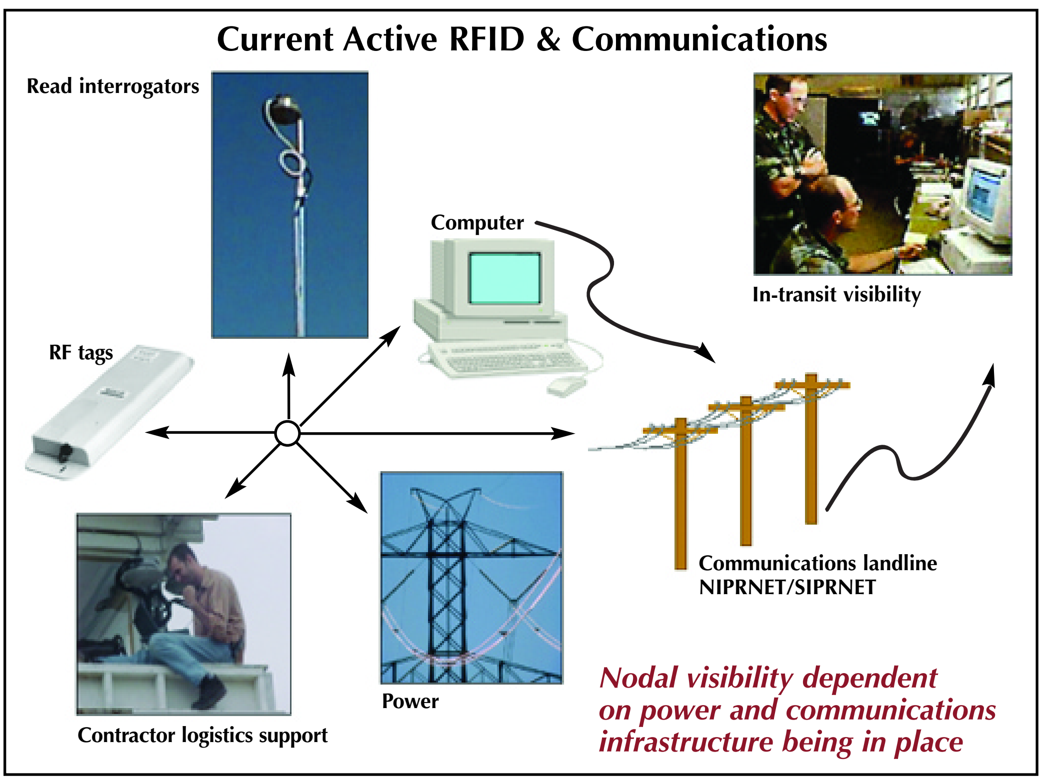
Initially, tag use was limited to demonstrations in places such as Haiti and Macedonia. In November and December 1995, U.S. Army Europe deployed to Bosnia as part of the North Atlantic Treaty Organization's Implementation Force with approximately 35 percent of its items tagged. By the spring of 1999, approximately 70 percent of all items moved for the Kosovo Force were tagged. Both the Army Reserve and Eighth U.S. Army in Korea received RFID-tagged sustainment stocks from Defense Logistics Agency (DLA) depots on the east and west coasts of the United States. In 2001, approximately 85 percent of equipment and sustainment stocks shipped from DLA that flowed into Operation Enduring Freedom in Afghanistan had RFID tags. In 2002, the commander of the U.S. Central Command (CENTCOM) released a message requesting that 100 percent of the items moving into, through, or out of the CENTCOM area of responsibility be tagged to permit nodal asset visibility. On 30 July 2004, the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics released a policy letter stating that "all DOD [Department of Defense] components will immediately resource and implement the use of high data capacity active RFID in the DOD operational environment."

The Present

Active RFID tags require fixed infrastructure, such as read interrogators, to provide in-transit visibility at different nodes of the supply chain. However, the best visibility that this capability can provide is a pretty good fix on where equipment was last detected, not necessarily where it is currently located.

Even with the robust active RFID infrastructure currently in place, immediate asset visibility is not possible when deploying into austere environments. The fastest that the Army and DOD have been able to set up a fixed RFID infrastructure in an austere environment is approximately 2 to 4 weeks. By that time, under normal operational tempo for an ongoing operation in the deployment stage, combat equipment and supplies have already moved through the intermediate staging base. This leaves the RFID infrastructure to play catchup, which, of course, never happens until much later in the operation.

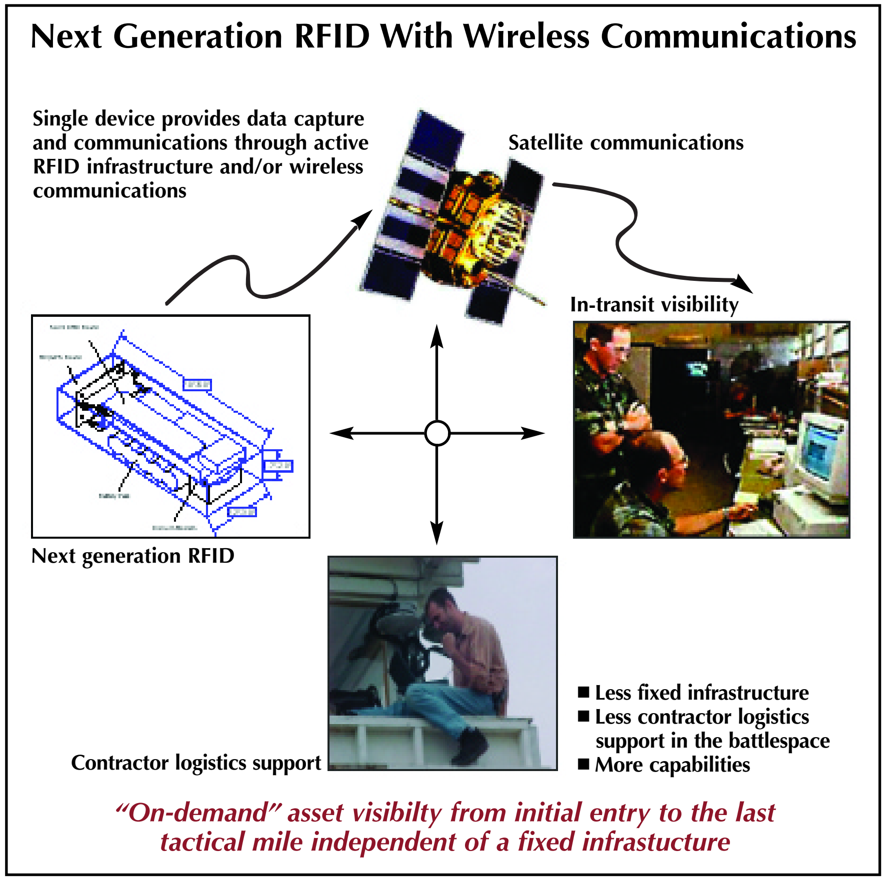
Fixed RFID infrastructure also adds materiel to an already overburdened support system. Power is required for the RFID interrogator and the computer that collects the data and provides them to the in-transit visibility servers. RFID also requires communications (by phone, local area network, or satellite) to report the location and asset information collected



Current RFID tags need fixed infrastructure to collect data and provide in-transit visibility.

by the computer. Contractor logistics support is needed to install and maintain this fixed infrastructure, which adds to the security burden of area commanders. Power, communications, and contractor logistics support are not always available when and where they are needed, particularly during the beginning stages of a deployment.

Lessons learned from Operation Enduring Freedom and Operation Iraqi Freedom show that the best we can expect from the current RFID capability, as technically efficient as it is, is to know where supplies and equipment were, not where they are.



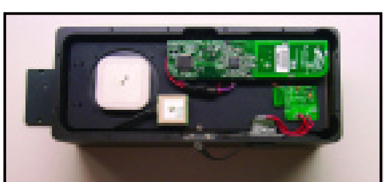
The 3G RFID w/SATCOM system will rely on satellite communications and global positioning systems to reduce RFID dependence on fixed infrastructure and improve the usefulness of RFID during deployments.

The Future

Although demand for active RFID has increased greatly, the technology has hardly changed in the last decade. The first step in creating the next generation of RFID tagging systems for asset tracking is taking three commercial-off-the-shelf products (the current standard DOD RFID system, a commercial global positioning system [GPS], and an Iridium satellite) and integrating them into one to create a new, enhanced capability.

RFID integrated with satellite communications and a GPS results in a single device that can overcome the "where is it now?" asset tracking problem. A prototype of this new capability being tested by the Army Logistics Transformation Agency is called Third Generation Radio Frequency Identification with Satellite Communications (3G RFID w/SATCOM). It has the potential to provide DOD with unprecedented on-demand supply and equipment in-transit visibility without fixed infrastructure. These new tags maintain all of the capabilities of their predecessors and, through the use of satellite and GPS, allow for true, up-to-the-moment global asset tracking.

The 3G RFID w/SATCOM system would be particularly useful in the beginning stages of a deployment, when regional combatant, joint task force, and other commanders find that their asset management information needs are most critical, by helping them in assessing their combat effectiveness. Under these circumstances, commanders require near-real-time and on-demand visibility.



This view of a prototype 3G RFID tag shows the Iridium satellite and GPS boards within the tag. These boards give the 3G RFID tag its satellite communications capability.

The pursuit of Total Asset Visibility remains a critical element in achieving Focused Logistics and Sense-and-Respond Logistics concepts. The 3G RFID w/SATCOM system will take a huge step forward in attaining these goals. For the past decade, the Army has been using active RFID technology to gain asset visibility. Today's capability provides information on where equipment was, not where it is. Additional RFID infrastructure is needed, which likely will increase the burden on an already taxed support system. While potentially reducing or eliminating the current fixed infrastructure, 3G RFID tags will provide unprecedented in-transit visibility. This increased visibility will enable the modernization of theater distribution and will be a key tool in connecting logisticians. **ALOG**

Jeffrey D. Fee is an action officer at the Army Logistics Transformation Agency at Fort Belvoir, Virginia. He is the project leader for Third Generation Radio Frequency Identification with Satellite Communications.

Alan Schmack is a logistics management specialist at the Army Logistics Transformation Agency at Fort Belvoir, Virginia.

The Role of Britain's 17 Port and Maritime Regiment in Force Projection

BY MAJOR LYNDON M. ROBINSON, ROYAL LOGISTIC CORPS

Many of you reading this article have had first-hand experience in working with British forces, either on exercise or on an actual operation. What may prove surprising, however, is that some U.S. Army soldiers have served at the very heart of British Army regiments. For example, a U.S. Army Transportation Corps officer, a major, served as the Operations Officer of 17 Port and Maritime Regiment, Royal Logistic Corps, during that unit's deployment to Iraq as part of Operation Iraqi Freedom. However, this article is not about that officer or the regiment's exploits during what the British call Operation Telic [the code name for the British campaign in the Persian Gulf in 2003]. Rather, it is about the regiment's role in enabling the United Kingdom to project military power throughout the world by sea.

Sea Move Issues

Her Majesty's Armed Forces have the capacity to deploy, sustain, and recover a combat force, including an armored division, to and from any continent in the world. That it can do so is utterly dependent on its logistic enablers, one of which is 17 Port and Maritime Regiment, complemented by its reserve component, 165 Port Regiment, Royal Logistic Corps (Volunteer).

The bulk of any expeditionary force invariably moves by sea. The most complex logistic aspect of a sea move is loading the force onto the ships and its subsequent offloading. It is complex because the move must be sequenced, the assets to be moved must be tracked, different cargo commodities must be handled, and, if necessary, the move must be completed at night. Moreover, the ships involved may be at sea, possibly in adverse weather, and trying to avoid an enemy that is doing its utmost to wreck the offload. These factors combine to make a sea move difficult. However, 17 Port and Maritime Regiment has the physical, moral, and conceptual components to do the job.

History

In the annals of British military history, 17 Port and Maritime Regiment is a relative newcomer. It was created in 1949 as a Corps of Royal Engineers unit and was tasked with operating ports and beaches all over the world in support of Her Majesty's Armed Forces. Since that time, the unit has been based at the military port of Marchwood opposite the international trading port of Southampton, which is on England's south coast. Army restructuring over the years saw the regiment evolve from the Corps of Royal Engineers to the Royal Logistic Corps. Notwithstanding this evolution, the regiment's disciplines remain the same. It continues, to this day, to provide the watercraft, rail, and port-operating skills required by an army that is serious about expeditionary warfare. This is important because, sadly for the British people, war is an ever-present factor in their national life.

Britain has been involved in large-scale conflicts during every decade of the last century. Two were major conflagrations. Superimposed on this catalog of conflicts were the peace-support operations associated with Britain's withdrawal from Empire [withdrawal from its colonies in Asia, Africa, the Caribbean, and the Pacific] and its historical duty to prevent the two communities of Northern Ireland from tearing themselves apart and descending into an abyss of hatred. Not surprisingly, 17 Port and Maritime Regiment has been involved in numerous conflicts from Korea to Iraq.

Mission

The regiment's mission is to maintain the readiness of the United Kingdom's deployable port, maritime, and rail capabilities. The regiment is charged with providing a sea point of embarkation or disembarkation using a well-found [properly equipped] port, an austere port, or a simple beach and, having done so, operating rail and riverine lines of communication. The regiment also must be able to provide a tactical loading and discharging capability to support the Royal Marine Commandos on amphibious operations.

Put simply, the regiment must be able to load and discharge ships at sea or in port, whether or not the enemy is around, and then move supplies forward by rail and river. To accomplish this, the regiment can operate over a beach or through a port. If necessary, the regiment can

An eclectic mix of soldiers with differing cultures, religions, and backgrounds make up 17 Port and Maritime Regiment. Above, a female port operator serves as a stevedore.

control all the port functions from the start of the main supply route (MSR) to the fairway buoy [the buoy marking the seaward end of navigable water in a channel, harbor, or river], including tug, pilotage, lighterage, and quayside [wharf] operations. Quite a task, you may think, but the unit has been at it for over 50 years during conflicts in Asia, Europe, and Africa.

Soldiers

The soldiers who constitute 17 Port and Maritime Regiment are employed in a variety of trades. Some are seamen, while others are port operators, railway operators, or marine engineers. You may be surprised to learn that, like its sister services, the British Army recruits from the more than 50 countries of the British Commonwealth and from the Republic of Ireland. Currently, soldiers from over 20 different countries serve in 17 Port and Maritime Regiment. As would be expected, most are from the United Kingdom, and a sizeable contingent hails from Fiji. This makes for an eclectic mix of soldiers with differing cultures, religions, and backgrounds.

Most of the major ethnic groups are represented, and there is not a sport the soldiers in the regiment cannot play. Despite the rich level of diversity within the regiment, as well as in the wider Armed Forces, all British soldiers have two fundamental characteristics in common. The first is that each has sworn allegiance to Her Majesty the Queen, and the second is that every soldier upholds the Army's values.

Training

Because 17 Port and Maritime Regiment is in the enviable position of having its barracks adjacent to a working military port, the soldiers operating the Sea Mounting Centre, as the port is known, are at the cutting edge of readiness. Having an amphibious training area nearby on The Solent (the channel between the Isle of Wight and Hampshire in south England) also allows the unit to practice its trade over a beach. Furthermore, squadrons frequently are attached to the Royal Marine Commandos to support their military exercises. The many opportunities to train foster a cohesive level of readiness in the regiment. The regiment's operation of the Sea Mounting Centre is also financially astute; the Defence Logistic Organisation saves the fees that it otherwise would have to pay to commercial companies to load and unload ships, and Headquarters Land Command does not have to pay for the use of modern port facilities for training purposes.

Equipment

As you might expect of a specialist logistic regiment of its type, 17 Port and Maritime Regiment has a wide variety of equipment. Looking from ship to shore, the first piece of battle-winning equipment one notices is the ubiquitous mexeflote. This vessel is a raft propelled by two outboard engines. The hull of the raft consists of metal boxes locked together. These boxes can be arranged in any number of configurations, depending on the lighterage requirements. Commanded by a corporal with a crew of five, the mexeflote is moved into theater either lashed alongside a specially designed landing ship logistic or unassembled in boxes on the deck of a conventional ship. The mexeflote is robust and capable, with enough lift capacity to hoist a bombed-up Challenger tank. None has ever foundered; they even withstood strafing by the Argentinean Air Force during the Falklands War in 1982.

The other major maritime asset of 17 Port and Maritime Regiment is the ramp craft logistic. Like the mexeflote, it can lift a main battle tank and can be used to conduct a volume offload over a beach. Unlike the mexeflote, however, it can self-deploy along the coastal waters to Asia, Africa, and Europe.

Looking from ship to shore, the first piece of battle-winning equipment one notices is the ubiquitous mexeflote. This vessel is robust and capable, with enough lift capacity to hoist a bombed-up Challenger tank.

On the land side, the regiment has the Case rough-terrain forklift. The Case, as it is commonly known, can carry pallets to and from ships over a beach in either cold or warm climates. The regiment also uses the 53,000-pound capacity rough-terrain container handler (RTCH) RT 240, which is well-known to U.S. logisticians. Other assets include rail locomotives that are owned by the Defence Logistic Organisation and a variety of other watercraft and trucks.

How It All Works

Loading. Let us suppose that there is trouble afoot somewhere in the world and that Her Majesty's Government has agreed to support the United States in an intervention operation. This support could consist of a joint force made up of a commando brigade, an armored brigade, and the necessary combat support and combat service support elements. Let us further suppose that a friendly nation would allow U.S. and U.K. forces to transit its territory.

The soldiers of 17 Port and Maritime Regiment would be engaged immediately. Commando assets would flood into the Sea Mounting Centre—the sea point of embarkation—and the regiment would load the assets onto specialist amphibious assault ships. Before sailing, a squadron from the regiment would embark. The armored brigade's assets then would pour into the Sea Mounting Centre for loading onto U.K. strategic lift ships. If more space was needed, other ships taken up from trade (STUFT) would be employed to transport the cargo. Concurrent with the loading, the regiment would hand over the running of the Sea Mounting Centre to its reserve component—165 Port Regiment—so that the balance of the regiment could break clean and move its manpower to the Air Mounting Centre for airlifting into theater. The strategic ships then would sail either immediately after loading or as part of a convoy if the threat conditions required it.

Discharging. Let us assume that the enemy has been far more aggressive than expected and that the host nation airfield and port have been disabled through terrorist actions. Possible responses would be for the commando brigade to conduct theater entry over a beach using assault landing craft or by air using helicopters. Using its mexeflotes and ramp craft logistic, 17 Port and Maritime Regiment would support the commando brigade's assault landing craft in the amphibious operation. After the Royal Marines had secured the beachhead, the deployed squadron from 17 Port and Maritime Regiment then would be assigned the role of developing the beach into a sea point of disembarkation (SPOD).

Once the Royal Marines had secured the airport and an air point of disembarkation had been opened, the rest of 17 Port and Maritime Regiment's manpower would arrive by air from the Air Mounting Centre. On arrival, the troops would move swiftly to the SPOD. As the strategic lift ships and the STUFT arrived, the regiment's port operators would be ferried to the ships lying at anchor to offload the armored brigade using skills unique to the regiment. The soldiers would man the ships' cranes and offload cargo onto mexeflotes and ramp craft logistic, which are crewed by the regiment's seamen and marine engineers.

The two main battle-winning assets of 17 Port and Maritime Regiment are the mexeflote (above) and the ramp craft logistic (below). Both vessels can lift a main battle tank and can be used to conduct a volume offload over a beach.

Ideally, however, soldiers would build ramp support pontoons (RSPs) for the ships' stern ramps using some of 17 Port and Maritime Regiment's mexeflote assets. The stern ramps would rest on the RSPs, which would provide a platform at the stern of the ship where the mexeflotes and ramp craft logistic could beach. The port operators, assisted by the vehicle crews, would drive the fighting vehicles and other assets over the RSPs and onto these watercraft. The port operators would use the Cases and RTCHs to move pallets and containers onto the watercraft and again to unload them when they beached. As soon as the engineers and host nation resources brought the port back on line, all SPOD operations, except ammunition handling, would switch from the beach to the port. Soldiers of 17 Port and Maritime Regiment then would concentrate at the port, and, if the host nation was unable to provide support, they would take responsibility for the port's operation. Shipping would be discharged conventionally, and the tonnes [metric tons; 2,204.6 pounds] of stores and equipment needed to support a division would be unloaded on the quay. The port then would be cleared using road, rail, and riverine MSRs. The road MSRs would be operated by transport regiments, whilst the unit's ramp craft logistic and rail assets would work the riverine and rail routes, respectively.

To project power, Her Majesty's Armed Forces must have a specialist port and maritime capability, which it has in the form of 17 Port and Maritime Regiment and its reserve component, 165 Port Regiment. The soldiers of 17 Port and Maritime Regiment have the moral, physical, and conceptual competence to do the job, which, simply put, is to load and discharge cargo—sometimes at night—from ships that may be at sea and under the watch of an active enemy. That the regiment can do this is attributable in part to its location at the Sea Mounting Centre, which has readily available port and beach training facilities, its equipment, and its vast operational heritage that extends over 50 years. However, the real key to the regiment's success is its soldiers in all their variety and richness. **ALOG**

Major Lyndon M. Robinson, Royal Logistic Corps, is on the faculty of the Army Logistics Management College at Fort Lee, Virginia. He formerly was second in command of 17 Port and Maritime Regiment and served in the regiment on three separate occasions, including during operations in Northern Ireland, the Balkans, and Iraq.

The Reality of the Single-Fuel Concept

BY MAURICE E. LE PERA

To simplify fuel operations, the Department of Defense (DOD) has adopted a single-fuel concept (SFC) that requires U.S. forces to use only one fuel while deployed. Although the concept has merits, it also has shortcomings. The challenge is to develop a policy that will best meet all military fuel needs.

Evolution of the SFC

Waxing and fuel filterability problems with the North Atlantic Treaty Organization's (NATO's) standard diesel fuel, F54, during cold weather created severe problems for the engines of M1 Abrams main battle tanks and other gasoline turbine-powered equipment when they were introduced to U.S. forces in Germany in 1981. [Diesel fuel typically has a high paraffin hydrocarbon content, which prevents it from flowing at low temperatures. Waxing refers to this situation, in which the paraffin hydrocarbons in the fuel congeal and wax-like particles are formed that can either coat the surfaces they contact or plug fuel filters.]

The interim fix for these problems involved blending the F54 diesel fuel with aviation kerosene turbine fuel (either JP5 or JP8) to lower both the waxing tendency and the viscosity of the diesel fuel. This blended fuel, known as the "M1 fuel mix," was used for all diesel-fueled equipment in forward areas from November through April annually. Other NATO countries soon adopted the blend (50 percent F54 and 50 percent JP8 or JP5), which subsequently was given the NATO code number F65. These fixes for the low-temperature operability problems more than likely served as the genesis for the SFC.

The subsequent requirement for blending of fuels created logistics problems that prompted the Army to adopt JP8 as an alternative to diesel fuel in 1986, circumventing the need to blend other fuels with diesel. DOD issued a directive on fuel standardization in March 1988 that specified JP8 as the primary fuel for air and land forces.

Testing and Field Trials

Users expressed concerns about using JP8 as a substitute for diesel fuel. These concerns included whether JP8 would burn hotter, if it would increase fuel consumption, and if it would be compatible with existing systems. As a result, the Army conducted many tests in the laboratory and on engine dynamometers, in addition to field and fleet tests, to validate using aviation kerosene turbine fuels in diesel engines and to dispel concerns. [Dynamometers measure mechanical power and assess engine durability and performance.]

Of the many successful fleet tests, one was particularly noteworthy. This 10,000-mile durability test was conducted with several commercial utility cargo vehicles (CUCVs) at the General Motors Desert Proving Ground in Mesa, Arizona, where they were exposed to round-the-clock operations in continuously hot climates. The test revealed no significant impacts on vehicle performance or fuel-injection

A 1–9 Field Artillery Battalion soldier from Fort Stewart, Georgia, prepares to refuel a 155-millimeter howitzer during a "refuel on the move" exercise in Kuwait.

pump wear, and no measured differences in engine operating temperatures were noted, which dispelled the fears of engines overheating because of supposedly hotter burning fuels.

One of the more significant and comprehensive tests of JP8 was a field demonstration conducted at Fort Bliss, Texas, from October 1988 through July 1991. This field demonstration involved about 2,800 diesel-powered vehicles and pieces of equipment that consumed over 4.7 million gallons of JP8. The demonstration proved successful: no catastrophic failures were attributed to JP8. In fact, no major differences in procurement costs, fuel consumption, oil change intervals, or component replacements were identified when compared to historical data for the same fleet of vehicles and equipment using diesel fuel.

A fuel specialist with the 127th Area Support Battalion, Division Supply Command, 1st Armored Division, signals the pump truck operator to stop the flow while another fuel specialist prepares to unhitch the fuel line from a UH–60 Black Hawk helicopter at Baghdad International Airport.

Implementation of the SFC Since 1990

When approved by the combatant commander, the primary fuel support for air and ground forces in overseas theaters will be a single, kerosene-based fuel. The SFC was first implemented in December 1989, when JP5 was used as the single fuel during Operation Just Cause in Panama.

In August 1990, DOD implemented the SFC by providing Jet A1 (JP8 without its three mandatory additives) for U.S. forces in Operations Desert Shield and Desert Storm. During those operations, some Air Force units were located on bases where only JP4, which could not be used in ground vehicles and equipment, was available. Some Army units requested diesel fuel instead of JP8 because JP8 did not make acceptable smoke in the M1 Abrams' exhaust-system smoke generators. Further compounding the problems was the lack of training of ground units, which would have reduced their initial concerns about using aviation fuels in ground vehicles and equipment. Despite these problems, the SFC was considered a success.

The SFC was implemented next for combat operations in Somalia, Haiti, and the eastern Balkans with the same success that it had achieved during Operations Desert Shield and Desert Storm.

Minor Problems

During Operations Desert Shield and Desert Storm, certain families of engines that used fuel-lubricated, rotary-distribution, fuel-injection pumps experienced some operational problems that resulted in hot-starting difficulty and gradual loss of power. (Hot starting refers to restarting a vehicle while its engine is still hot.) Usually, the engines that experienced the most problems were the General Motors 6.2-liter and 6.5-liter engines, which use the commercially manufactured Stanadyne fuel-injection pump. These engines power smaller tactical wheeled vehicles, such as CUCVs and high-mobility, multipurpose, wheeled vehicles (HMMWVs). The Stanadyne fuel-injection pump is used on a variety of other engine systems that provide power to combat support and combat service support equipment.

Causes of the problems with the engines included—

- Sustained operation during high temperatures.
- Failure to retrofit the Stanadyne fuel-injection pump with elastomer insert drive governor weight retainer assemblies.
- Improperly manufactured replacement parts.
- Corrosion.
- Unauthorized oils and fluids added to Jet A1 fuel.
- Use of Jet A1 that did not contain corrosion inhibitor and lubrication-enhancing additives. The viscosity of the Jet A1 fuel being supplied by Saudi Arabia under a host nation support agreement was very low, as was the sulfur content, which further compounded the hot-starting problems.

Ironically, none of these problems occurred during the extensive testing at Fort Bliss. In hindsight, the test at Fort Bliss used JP8, which has a higher viscosity than the Jet A1 fuel typically refined in the Middle

East, and temperatures at Fort Bliss were at least 15 degrees Fahrenheit lower than those encountered in Southwest Asia.

Fuel-Injection Pump

Of the many types of fuel-injection pumps manufactured commercially, such as the single-cylinder pump, the inline pump, and the distributor pump, the rotary-distribution, fuel-injection pump is the most sensitive to the lubricating quality of the fuel. This pump is inexpensive and is used in a wide variety of commercial and military equipment typically powered by light-duty diesel engines. In these pumps, the fuel provides the needed lubrication to the internal moving components. When the lubricity (lubricating quality) of the fuel becomes marginal or insufficient, the pump components will wear.

If fuel viscosity is sufficiently high, the fuel will physically separate the injection system's sliding components, preventing wear. With a lower viscosity, the potential for wear increases significantly because the surfaces of the sliding parts can begin to interact. However, certain additives to the fuel will generate surface films that provide the needed wear protection.

The viscosity of fuel decreases as the fuel temperature increases, thus decreasing the fuel's ability to lubricate the injection system and increasing users' dependence on lubricious surface films to control component wear. American Society for Testing and Materials (ASTM) D 975, Standard Specification for Diesel Fuel Oils, sets the current industry standard for the minimum viscosity of grades 1–D and low sulfur 1–D diesel fuel at 1.3 square millimeters per second (mm^2/s) at 40 degrees Celsius. While the viscosity of JP8 at 40 degrees Celsius is not identified in the JP8 specification (MIL–DTL–83133E), the observed range of viscosity varies from 1.0 to 1.7 mm^2/s at 40 degrees Celsius. Obviously, using a fuel with viscosity lower than 1.3 mm^2/s will accelerate the potential for component wear. Of the four major manufacturers of rotary-distribution, fuel-injection pumps, Stanadyne Automotive Corporation is the only one that provides factory retrofit kits for lessening the potential for wear and hot restart problems when using low viscosity fuel.

Another adverse effect resulting from using low-viscosity fuels in rotary-distribution, fuel-injection fuel pumps is the increased potential for internal leakage. A combination of low-viscosity fuel and increased clearances between surfaces due to wear (resulting from insufficient lubricity) can result in increased internal fuel leakage that reduces the amount of fuel delivered to the combustion chamber. More internal leakage in the pumping sections occurs at low engine speeds, causing hot-starting and hot-idle problems. Some of these problems surfaced during the latter stages of Operations Desert Shield and Desert Storm.

Major Problems Since 9/11

With the recent major combat operations in Afghanistan and Iraq, fuel-related problems have increased significantly as a result of using low-viscosity fuels as the single fuel. In Afghanistan, much of the aviation kerosene that initially was procured was Russian TS1 aviation kerosene because the neighboring refineries produce aviation kerosene as TS1 instead of Jet A1 or JP8. The Russian TS1 aviation kerosene is similar to Jet A1, but it is more volatile because it has a lower flash point and a lower viscosity.

A fuel specialist with the 127th Area Support Battalion, Division Supply Command, 1st Armored Division, takes a fuel sample for testing at Baghdad International Airport.

The fuel being used in Iraq is JP8. However, in both Afghanistan and Iraq, the ground vehicles and equipment are being used much more extensively than they would be used in normal service. Considering this added use, the hot temperatures that typically prevail in the Middle East, and the increasing engine-power demands imposed by the increased weights of up-armor kits, it is no wonder that the ground vehicles and equipment that have rotary-distribution, fuel-injection pumps have had many fuel-related engine problems.

An article in the July 2004 issue of *National Defense* magazine, "Army Ponders New Diesel Engine for Humvee Trucks," notes that maintenance nightmares have been experienced in Iraq because engines regularly break down and often must be replaced after only 1,000 to 2,000 miles of operation. Much of the blame for this is placed on the bolted-on armor protection that adds weight to the vehicles. However, the inability of the rotary-distribution, fuel-injection pumps to operate satisfactorily for sustained periods of heavy-duty operation is probably a contributing factor, especially when low-viscosity fuel is used in a hot environment. Interestingly, the fuel-injection pumps in many, if not all, of the HMMWVs operating in Southwest Asia have been retrofitted with Stanadyne's Arctic Fuel Conversion Retrofit Kit. This kit apparently has done little to offset the significant increases in maintenance that have been experienced recently.

Rethinking the SFC

Combat operations that occur in higher temperature environments certainly will intensify the operational and maintenance problems of diesel-powered vehicles and equipment with fuel-lubricated fuel-injection pumps. Since almost half of the Army's diesel vehicles and equipment have rotary-distribution, fuel-injection pumps, a solution is urgently needed.

Despite the maintenance and readiness problems it has created, the SFC has created many benefits. One fuel is considerably easier to manage than multiple fuels. The functions of fuel storage, transportation, and distribution can be tailored for maximum efficiency. Using a single fuel lessens the possibility of dispensing the wrong fuel. Using JP8 as the single fuel has enhanced long-term storage stability, improved cold weather vehicle operation, reduced engine combustion component wear, and reduced fuel system corrosion problems.

The most recent version of DOD Directive 4140.25, DOD Management Policy for Energy Commodities and Related Services, stipulates that ". . . it is imperative that combat support and combat service support vehicles and equipment be capable of receiving support (i.e., fittings, nozzles, etc.), achieving and sustaining acceptable operational performance using both kerosene-based turbine fuel and diesel fuels to the maximum extent practical." Policy directives may not always match reality, which is the case with the large numbers of diesel-fuel-consuming vehicles and equipment with rotary-distribution, fuel-injection pumps.

Certainly, the significant increases in maintenance requirements that have been experienced in Afghanistan and Iraq strain an individual's understanding of the phrase "sustaining acceptable operational performance." This is not saying that the SFC doctrine is flawed, but some changes are urgently needed.

Ironically, a strategy research project completed in April 1996 at the Army War College identified some possible problems with the SFC and gave several recommendations. Two of the more significant recommendations were—

- The fuel pumps on all new equipment must be compatible with JP8.
- All future military equipment must be designed to use JP8 as the primary fuel source.

Both of these recommendations are as relevant today as they were in 1996.

DOD Directive 4140.25 requires that acceptable operational performance be achieved with both kerosene-based turbine fuels and diesel fuels. However, one fuel type must predominate over the other, and, since compression-ignition engines are essentially designed and manufactured for diesel fuel consumption, the predominant fuel naturally would be diesel. An engine's fuel pump must be JP8 compatible in all types of operating conditions, not just in environments with cold to moderate temperatures.

Because of the large number of existing vehicles and equipment that use the fuel-lubricated, rotary-distribution, fuel-injection pumps, one approach would be to make the SFC doctrine more flexible by requiring use of diesel fuel when systems operate for sustained periods in a high-temperature environment. This change would least affect the Air Force because it typically operates from fixed sites that are removed from direct combat operations so that two fuel distribution and storage systems are easier to implement. The Army and Marine Corps would be affected more because they require one fuel distribution system for ground equipment and a second for helicopters and both systems require intense protection and support. This dual-system option is complicated further by doctrine calling for highly mobile, distributed, autonomous combat units.

Another, albeit more complicated, approach would be to require that the rotary-distribution, fuel-injection pumps be replaced with pumps that are less sensitive to fuel viscosity and lubricity, such as the common rail or pump-line nozzle systems.

Failure to recognize and act on the problems inherent in the use of kerosene-based fuel with rotary-distribution, fuel-injection pumps will only serve to decrease operational readiness and increase maintenance costs over time. **ALOG**

Maurice E. Le Pera is the president of Le Pera and Associates of Harrisonburg, Virginia. He is a graduate of the University of Delaware and had 36 years of Government service.

The author wishes to thank Emilio S. Alfaro of the Air Force Petroleum Office and Edwin C. Owens of the Southwest Research Institute for their assistance in developing this article.

LOG NOTES

Parochialism in FA 90?

I read with interest the article by retired Major General Terry E. Juskowiak and Lieutenant Colonel Robert L. Shumar concerning the Multifunctional Logistician Program in the November–December issue of *Army Logistician*. I don't necessarily disagree with the need to better develop multifunctional logisticians; however, I found it curious that the 12 formerly coded 88 (Transportation Corps) Surface Deployment and Distribution Command command positions were deemed to be more appropriately coded as FA 90 commands, while other functional battalion command positions were left alone. The terminal operations, distribution, and traffic management skill sets relative to commanding one of these former 88 battalions are certainly as functionally unique as those skill sets related to ammunition, supply, and POL [petroleum, oils, and lubricants] units.

While the article speaks of the need to curtail parochial divisions between the logistics branches, this very selective half-measure only enhances the perception that parochialism is alive and well.

BG Donald D. Parker, USA (Ret.)
Southport, North Carolina

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CORRECTION

Lieutenant General Robert T. Dail, Deputy Commander, U.S. Transportation Command, Scott Air Force Base, Illinois, was incorrectly identified on page 1 of the January–February 2005 issue of *Army Logistician*. The *Army Logistician* staff sincerely apologizes for this error.

ALOG NEWS

(continued from page 1)

JOINT ACQUISITION CELL HELPS SPEED EQUIPMENT TO TROOPS

The Joint Rapid Acquisition Cell, formed at the Pentagon in September, is helping to speed up the delivery of urgently needed off-the-shelf equipment to fighting troops.

Robert Buhrkuhl, director of the cell, said that the new process could cut months—and in some cases years—from the acquisition timetable. Many legal requirements that tend to bog down military contracts do not apply during wartime, particularly when they involve relatively small dollar amounts, Buhrkuhl explained. During wartime, the Congress lifts many of these restrictions, he said, and the focus shifts to identifying urgent operational needs, finding ways to fill them, and moving the process along as quickly as possible. The new cell is not introducing a new procurement process, Buhrkuhl stressed, just a way to help push critical requests through the existing process. "Our goal is to allow more flexibility to move things forward and save lives," he said.

In his 3 September memorandum ordering the acquisition cell's standup, Deputy Secretary of Defense Paul Wolfowitz wrote that "Congress has given the department authority and flexibility to meet many of these needs. Yet, all too often, our organizations are reluctant to take advantage of them."

Wolfowitz also directed the Joint Staff, the combatant commands, and each service to appoint an official who is authorized to commit their organization's support to the cell. Buhrkuhl said that assigning to the cell senior people who are empowered to make decisions moves the procurement process along. "Having to get permission slows things down," he said.

Airmen unload commercial off-the-shelf equipment needed for satellite communication in support of Operation Enduring Freedom.

The cell's goal is to act on requests for immediate warfighter needs within 48 hours. Officials hope to ensure that a contract is awarded and the goods and services delivered within 4 months, Buhrkuhl said.

Requests currently come to the cell as classified email. All incoming requests for an urgent operational need must be approved by a general officer and the Joint Staff. If a request is refused, the requester receives feedback explaining if or when the request will be acted on.

Items high on the cell's priority list are items that provide protection from improvised explosive devices, side body armor, body heating and cooling systems, and Arabic interpreters.

LOGISTICS COMPUTER SYSTEMS TRAINING CENTER OPENS IN IRAQ

Soldiers supporting Operation Iraqi Freedom can learn to use the Army's automated logistics systems in theater rather than having to travel to Kuwait or the United States for training. A new logistics training facility opened at Logistics Support Area Anaconda in Balad, Iraq, in October. The Automated Logistics Assistance Team (ALAT) training facility provides classroom and over-the-shoulder training and offers technical assistance with the Army's logistics computer systems. Having the ALAT in Iraq saves units time and money and provides immediate assistance to deployed soldiers.

The opening of the ALAT coincided with a graduation ceremony for the first group of soldiers to be trained in Iraq on a new company-level property accountability system.

'SINGLE TICKET' PROCESS SPEEDS SOLDIER DEPLOYMENT

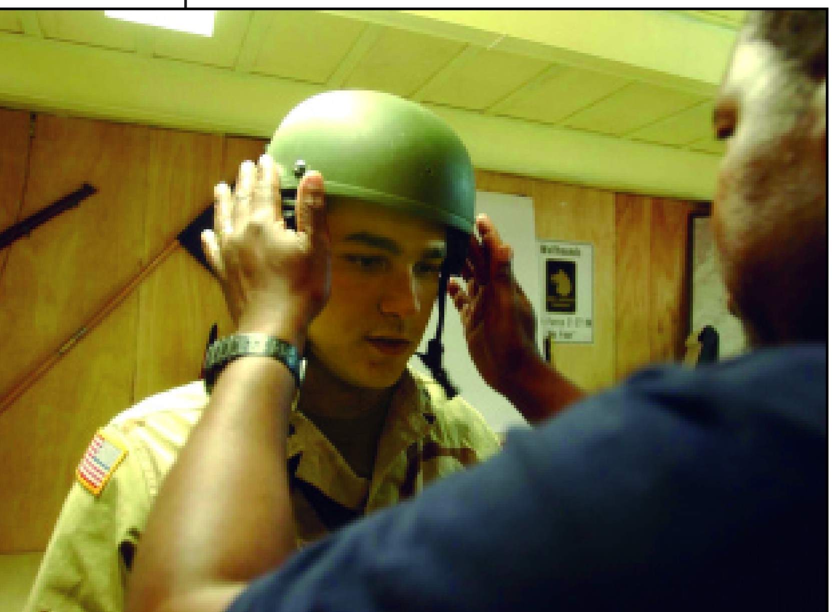
The U.S. Central Command's Deployment and Distribution Operations Center (CDDOC) has reduced troop deployment time by decreasing the time soldiers have to wait between flights. The wait for onward movement that was up to 72 hours is now less than 24 hours.

CDDOC accomplished this by implementing a process that assigns each soldier a "ticket" from his home base to his ultimate theater location, effectively planning his transportation from start to finish. The "single ticket" process is designed to correct delays in the onward movement of troops once they arrive in theater. It allows theater airlift planners to know up to 96 hours out the number of soldiers needing transportation and to schedule airlift for onward movement more efficiently. Previously, onward movement was not coordinated or planned until soldiers reached an intermediate location in the theater.

The concept worked well during Operation Iraqi Freedom II and Operation Enduring Freedom V rotations when it was used for the simultaneous deployment and redeployment of more than 15,000 troops from the 25th Infantry Division (Light), 10th Mountain Division (Light Infantry), and 22d Marine Expeditionary Unit. The process also was used for the 1st Marine Expeditionary Force rotation in October, when approximately 45,000 Marines were moved into and out of Iraq.

RAPID FIELDING INITIATIVE SPEEDS GEAR TO TROOPS

In response to the rapid deployments of the past few years, the Army Chief of Staff created the Rapid Fielding Initiative (RFI), which quickly provides soldiers preparing for or engaged in military operations with the best weapons, clothing, and equipment available. Although most units receive an RFI issue before deploying, some soldiers still are missed. In such cases, an RFI team from the Program Executive Office (PEO) Soldier at Fort Belvoir, Virginia, travels to the field to arrange delivery of equipment to the soldiers who did not receive the RFI issue at their home stations.



A Rapid Fielding Initiative team member fits a soldier in Afghanistan with an advanced combat helmet.

After visiting soldiers in the field, the RFI team sends the soldiers' measurements and sizes back to the RFI warehouse in Kuwait. There, a duffel bag is filled with each soldier's gear based on his sizes. The bag then is sent back to the soldier's unit for issue. The items issued vary by the type of unit, but most soldiers get improved T-shirts, belts, socks, silk-weight long underwear, goggles, hydration systems, improved knee pads, fleece jackets, and overalls. Some are even issued multifunction tools and other tools they use as part of their military occupational specialty.

PEO Soldier officials believe that the initiative not only addresses actual operational concerns and provides additional capabilities to soldiers who need them most but also creates the knowledge and infrastructure to accelerate fielding efforts, thus increasing the Army's credibility with soldiers in the field.

In addition to the teams visiting overseas locations such as Afghanistan, Iraq, and Kuwait, three RFI teams are traveling to each installation in the United States to issue RFI items to active-duty and Reserve component soldiers. The teams will continue to visit each continental United States installation during the next few years, with the goal of completing Army-wide RFI by 2007.

ARMY BUSINESS INITIATIVE COUNCIL APPROVES LATEST ROUND OF INITIATIVES

The Army Business Initiative Council in November approved its ninth round of initiatives for Army implementation or submission to the Department of Defense. The seven initiatives included the following—

- Assess the processes that affect the design of parts and components for integration into performance-based logistics. The goal is to improve the reliability and availability of systems and subsystems by improving the performance of components and parts.
- Conduct a pilot project for delivering electrical power at four to six installations using strategic partnerships with commercial vendors. The vendors would install, own, operate, and maintain power-generation facilities at the installations and provide power at rates significantly below the prevailing market rates most installations now pay.
- Create an interface for Army Knowledge Online (AKO) with the Defense Enrollment Eligibility Reporting System (DEERS). This will make the DEERS database the single definitive source for authenticating AKO users and supplying them with basic entitlements and benefit information.
- Establish a single sign-on capability under AKO so users can access personal Defense Finance and Accounting Service and TRICARE information without using multiple passwords and identifications.
- Develop a prototype that links existing manpower, personnel, and budget databases and tools to better align personnel with authorized manpower end strength and work-year authorizations as adjusted by major Army commands or installations.

• Develop a means for neighboring installations, including non-Army installations, to collaborate in such areas as pooling resources and cooperating on regional issues.

• Combine all family support offices at Selfridge Air National Guard Base, Michigan, into a single office to eliminate duplication, increase efficiency, and provide customers with a single point of entry. The installation currently has three family support offices serving its three main activities: the 127th Wing, Michigan Air National Guard; the 927th Air Refueling Wing, Air Force Reserve; and the U.S. Garrison-Michigan Army Community Service.

Since its creation in 2001, the Army Business Initiative Council has approved 122 initiatives. The council's mission is "to improve the effectiveness and efficiency of the Army's business operations by identifying, evaluating, and implementing business initiatives that streamline Department of the Army business operations and create savings."

GOVERNMENT RETAINS MANAGEMENT OF THREE DLA DEPOTS

The Defense Logistics Agency (DLA) completed three public-private competitions for management of its Defense distribution depots during fiscal year 2004. In all three competitions—for Defense Distribution Depot Tobyhanna, Pennsylvania, Defense Distribution Depot Corpus Christi, Texas, and Defense Distribution Depot Puget Sound, Washington—it was decided that depot operations and management will remain in-house rather than be turned over to a private contractor.

DLA announced in March 1998 that it would study 16 of its 18 Defense distribution depots in the continental United States for possible contracting out to the private sector (all except its primary distribution sites at Susquehanna, Pennsylvania, and San Joaquin, California). The competitions are conducted under the guidelines contained in Office of Management and Budget Circular A–76, Performance of Commercial Activities.

Of the 12 competitions completed to date, 6 have resulted in operations remaining within the Government: Richmond, Virginia; Albany, Georgia; and Columbus, Ohio, as well as Tobyhanna, Corpus Christi, and Puget Sound. Six competitions have been won by contractors: Cherry Point, North Carolina; Warner-Robins, Georgia; Jacksonville, Florida; Hill, Utah; Barstow, California; and San Diego, California. Competitions for the remaining four depots—Norfolk, Virginia; Anniston, Alabama; Red River, Texas; and Oklahoma City, Oklahoma—are scheduled for completion by 2007.

In October, DLA also activated its 25th distribution site, Defense Distribution Depot Guam Marianas (DDGM), in Guam. DDGM will support Department of Defense customers in Guam. Management of warehousing and distribution operations at the new depot will be managed by a contractor, Eagle Support Services Corporation of Huntsville, Alabama. Other distribution depots opened in fiscal year 2004 include those in Sigonella, Italy, and Kuwait.

NEW EQUIPMENT IMPROVES CONTAINER HANDLING AT MOTSU

New container- and materials-handling equipment at Military Ocean Terminal Sunny Point (MOTSU), North Carolina, will save money and improve container throughput for the Department of Defense (DOD).

DOD has been moving toward 100-percent containerization of munitions since the early 1970s. Ninety percent of the ammunition that comes through MOTSU is containerized. The new equipment was procured as part of a modernization plan that began in 2003 to decrease operating costs, increase productivity, enhance customer service, and comply with a DOD requirement to be able to transship 10,000 containers in 14 days.

MOTSU's Strategic Plan, published in 2003, includes a goal to improve efficiency of the terminal by upgrading operational processes, developing automated cargo management systems, and procuring equipment to support the near-exclusive use of containers. As a result, the terminal is transforming from a breakbulk terminal to a container terminal.

"We knew we had to maximize the movement of containers to keep the ship working and the way to do that was to move two 20-foot containers at a time. . . . We did a cost-benefit analysis of double loading, also known as 'picking,' which showed we could move 1,856 containers in 8 days instead of 12 by double picking," said Steve Kerr, the transportation manager at MOTSU. "Our former fleet of 40-foot chassis was not capable of handling double-picked loads of up to 105,820 pounds. We had to focus on procuring the right equipment to do the job."

The new, commercially available equipment will increase productivity and save time and money fleet of gas and electric forklifts is being replaced with commercial diesel forklifts better suited for heavier ammunition containers, and both MOTSU wharf cranes have been refurbished.

By fiscal year 2006, the terminal's rail spurs will be upgraded to accommodate current industry rail fleets. Funds have been programmed for fiscal year 2007 to convert the breakbulk-capable center wharf to a container-capable wharf with three container cranes to better accommodate commercial container vessels.

Soldiers of the 502d Engineer Company, 565th Engineer Battalion, 130th Engineer Brigade, from Hanau, Germany, position their bridge-erection boats against the current as they remove a Mabey-Johnson float bridge from the Euphrates River near Al Qaim, Iraq. The float bridge provided a vital crossing point for the people in the area after bombing by insurgents rendered the original bridge unusable for foot or vehicle traffic. Thirty-five soldiers dismantled the two land spans and seven floating spans of the bridge in November and moved them to Assydnia, which is near Forward Operating Base Anaconda.

because it can haul two containers at once and eliminates the need for additional labor to remove twist locks under the crane. Approximately 700 1960s-vintage 20-foot chassis will be replaced with twenty-four 45-foot bomb cart port chassis. Twelve bomb carts and yard tractors to pull each of them have already been purchased.

Additional improvements include a refurbishment of a container transfer crane and purchase of a new $3 million rail-mounted transfer crane. The current

THE ARMY'S 'MR. LOGISTICS' RETIRES AFTER 64 YEARS OF SERVICE

The Army's senior logistician, Eric A. Orsini, retired from civilian service at the end of January, completing 64 years with the Army and 52 years in logistics. Orsini, 87, served 30 years as a soldier, entering the Army in June 1941—5 months before the attack on Pearl Harbor—and retiring in 1971 as a colonel. A graduate of the Ordnance Officer Advanced Course, he became Chief of the Maintenance Division in the Office of the Assistant Secretary of the Army for Installations and Logistics in 1963.

In 1971, Orsini began 33 years of service as an Army civilian, including 25 years as a member of the Senior Executive Service. He served for many years as Deputy for Logistics to the Assistant Secretary of the Army for Installations and Logistics and ended his career as Special Assistant to the Deputy Chief of Staff, G–4.

A combat veteran of World War II, Orsini received the Silver Star, Bronze Star Medal, and Purple Heart.

Eric Orsini's 64-year Army career began before World War II and included 30 years as a soldier and more than 33 years as a civilian.

Writing for *Army Logistician*

If you are interested in submitting an article to *Army Logistician*, here are a few suggestions that may be helpful. Before you begin writing, review a past issue of *Army Logistician*; it will be your best guide. Keep your writing simple and straightforward (try reading it back to yourself); attribute all quotes; avoid footnotes (*Army Logistician* is not an academic journal); and identify all acronyms and technical terms. *Army Logistician's* readership is broad; do not assume that those reading your article are necessarily soldiers or that they have background knowledge of your subject.

Do not worry too much about length; just tell your story, and we will work with you if length is a problem. However, if your article is more than 4,000 words, you can expect some cutting.

Do not submit your article in a layout format. A simple Word document is best. Do not embed photos, charts, or other graphics in your text. Any graphics you think will work well in illustrating your article should be submitted as separate files. Make sure that all graphics can be opened for editing by the *Army Logistician* staff.

Photos are a great asset for most articles, so we strongly encourage them. Photos may be in color or black and white. Photos submitted electronically must have a resolution of at least 300 dpi (.jpg or .tif). Prints of photos may be submitted by mail. Please try to minimize use of PowerPoint charts; they usually do not reproduce well, and we seldom have the space to make them as large as they should be.

Army Logistician publishes only original articles, so please do not "market" your article. Ask your public affairs office for official clearance for open publication before submission to *Army Logistician*. A clearance statement from the public affairs office should accompany your submission. Exceptions to this requirement include historical articles and those that reflect a personal opinion or contain a personal suggestion. If you have questions about this requirement, please contact us at alog@lee.army.mil or (804) 765–4761 or DSN 539–4761.

Submit your article by email to alog@lee.army.mil or by mail to EDITOR ARMY LOGISTICIAN/ALMC/2401 QUARTERS RD/FT LEE VA 23801–1705. If you send your article by mail, please include a copy on floppy disk if possible. We look forward to hearing from you.

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- Patriot and Avenger Reset
- Installation Management—Camp Swampy to *Starship Enterprise*
- A New Tool for Simulation Modeling
- Slaying the Manpower Dragon
- Iraqi Security Forces
- The Support Leader Digital Assistant
- Chronic Medications in Iraq
- Marine Corps Ground Ammunition: A Business Enterprise

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