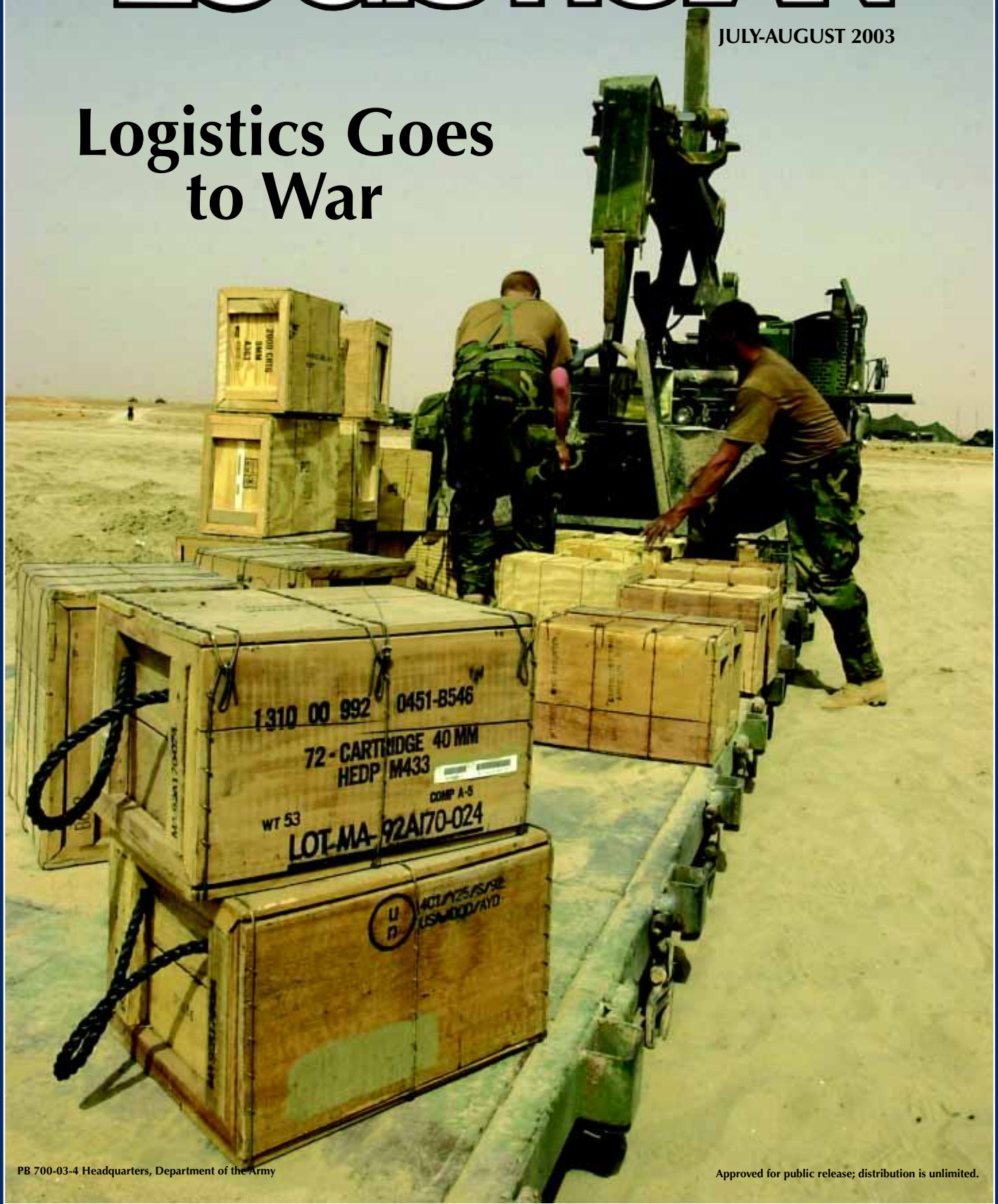
ARMY LOGISTICIAN

JULY-AUGUST 2003

Logistics Goes to War



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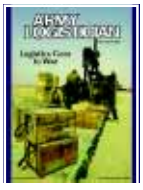

Cover: Fighting a war would be impossible without fuel, ammunition, food, water, and other supplies. Articles on pages 6, 24, 26 and 29 tell of the logistics support provided to U.S. service members participating in Operation Iraqi Freedom. In the cover photo, soldiers assigned to the 407th Forward Support Battalion offload supplies for the soldiers of 2d Brigade Combat Team, 82d Airborne Division, at an assembly area in south central Iraq.

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

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ALOG NEWS

FUTURE COMBAT SYSTEMS PROGRAM PASSES INITIAL TESTS

Fielding of the Army's Objective Force took a significant step forward this spring with the successful completion of the Future Combat Systems (FCS) Capstone Demonstration and endorsement of the FCS program by the Joint Requirements Oversight Council (JROC).

"The decision by the JROC, following on the heels of a highly successful week of Capstone Demonstrations, is strong indication that the Department of Defense is moving ahead with its vision for transformation of The Army," observed Lieutenant General John Riggs, the director of the Objective Force Task Force. "Operation Iraqi Freedom was a clear validation that we are on the right path, with an FCS program that provides for a lighter, more mobile force with even greater lethality and survivability."

Following the success of the FCS Capstone Demonstration, the JROC—

- Approved the FCS Operational Requirements Document.
- Validated the seven FCS Key Performance Parameters (KPPs).
- Delegated approval authority for operational requirements documents for non-key performance parameters to the Chief of Staff of the Army.
- Approved the Army's plan for regular JROC review of the FCS program and KPP updates.
- Assigned the Joint Potential Designator "Joint," ensuring interoperability, to the FCS Program.

FCS will be a networked "family of systems" that will use advanced communications and technologies to link the soldier with manned and unmanned air and ground platforms and sensors. This highly agile and lethal force will provide the tactical formations required to fulfill the Army's vision for an Objective Force.

The Capstone Demonstration, which was conducted at Fort Knox, Kentucky, and Fort Belvoir, Virginia, was the wrap-up for seven previous demonstrations held during the FCS Concept and Technology Development phase. The demonstration was intended, in part, to illustrate the FCS program's concepts and demonstrate the program's readiness for transition to the System Development and Demonstration phase.

The commercial Lead Systems Integrator, working in partnership with the Army and the Defense Advanced Research Projects Agency (DARPA), has total systems performance responsibility for the FCS program. The Lead Systems Integrator manages the identification, selection, and procurement of major systems and subsystems. The Lead Systems Integrator also works with the Army to develop the operational, technical, and systems architectures, which will provide links to the Objective Force as well as joint, interagency, and multinational organizations.

DARPA currently manages the FCS Concept and Technology Development phase of the program. Following the beginning of the FCS System Development and Demonstration phase, the Army's Program Executive Officer for Ground Combat Systems will assume responsibility for systems integration, production, fielding, and sustainment.

The FCS's first unit equipped will be fielded in 2008, and the initial operational capability for the first FCS-equipped unit of action will be in 2010.

LOG SYMPOSIUM SPOTLIGHTS LOG TRANSFORMATION PROGRESS

"We cannot continue to conduct business with service-centric, stovepiped systems." With those words, Major General Terry E. Juskowiak noted that the emphasis of future warfighting will be on joint operations and multinational coalitions.

General Juskowiak, Commander of the Army Combined Arms Support Command at Fort Lee, Virginia, was speaking at the 2003 Logistics Transformation Symposium and Exposition, held in Richmond, Virginia, in April. The theme of the symposium, sponsored by the Association of the United States Army, was "Sustainment: People, Readiness, Transformation." The gathering of top logisticians provided an opportunity to review the status of Logistics Transformation and gain an early look at the Army's performance in Operation Iraqi Freedom.

General Paul J. Kern, Commander of the Army Materiel Command, reported that the 3d Infantry Division (Mechanized), the spearhead of the Army's dash across southern Iraq to Baghdad, had a 95-percent operational

(News continued on page 44)

'A Full Partner'—Logistics and the Joint Force

The Focused Logistics Campaign Plan sets out the 'logistics azimuth' for the transformation of the U.S. military. This first article in a series on the plan examines the concepts behind focused logistics.

As this is being written, our Nation's war with Iraq is winding down. The regime of Saddam Hussein has been toppled, our Armed Forces are in Baghdad, and their mission is shifting from the pursuit of decisive victory on the battlefield to the longer term challenges of rebuilding a liberated Iraq. It is too soon for *Army Logistician* to publish articles on what happened in Iraq and what lessons are being learned. Our coverage of the war will unfold in coming issues, as participants have time to reflect on their experiences. At this point, however, it may be useful to briefly review the concepts underlying the future of U.S. military logistics—concepts that have received an early test in Operation Iraqi Freedom. Those concepts are summarized in a document known as the "Focused Logistics Campaign Plan."

Focused logistics is, of course, one of the tenets of Joint Vision, the template for defense transformation first presented in the mid-1990s and revised and extended since then. The campaign plan defines focused logistics as—

> the ability to provide the joint force the right personnel, equipment, supplies, and support in the right place, at the right time, and in the right quantities, across the full range of military operations.

This ability will be achieved "through a real-time, web-based information system providing accurate, actionable visibility as part of a common relevant operational picture, effectively linking the operator and logistician across joint forces, services, and support agencies."

The key term to understanding the roadmap to focused logistics—the Focused Logistics Campaign Plan—is "joint." Joint logistics will be the basis of future logistics.

A Future of Joint Operations

The growing emphasis on joint logistics is inseparable from the transformation efforts sweeping the Army and the entire Department of Defense (DOD). Transformation is driven in part by the need to respond to a fundamental change in the geopolitical situation facing our Nation. The Army that was designed to fight the armored forces of another superpower on the plains of north Germany is changing to meet the new threats posed by a post-Cold War world. The Army and the other services now must be ready to meet adversaries ranging from nongovernmental terrorists to rogue states to major powers who, in the words of the plan, "will rely on surprise, deception, and asymmetric warfare to achieve their objectives." As Vice Admiral Gordon S. Holder observed, "Even though no other country can match our capabilities to move and sustain military forces, our capabilities don't fully meet all the challenges we face today or will face in the future."

Transformation in the Army and DOD also is a response to technological developments, in particular the digitization of communications. Military transformation is, to a considerable degree, a manifestation of the Information Age. Just as the personal computer and the Internet have come into our homes and changed how we communicate with each other, how we transact business, and how we obtain information and news, so advances in electronic communications have revolutionized the conduct of military affairs. New information technologies are rapidly breaking down old "stovepipe" ways of managing military operations and pushing all of DOD toward consolidation, multifunctionality, and "jointness." The information technologies that we now take for granted have provided warfighters and sustainers alike with capabilities that a few short generations ago would have been viewed as the product of overactive imaginations.

In this new world of multiple potential threats and rapidly emerging technologies, Army warfighters increasingly will participate in joint operations, and joint warfighting will require joint logistics. Army logisticians must be prepared, as they never were in the past, to function in a joint environment and as part of a joint team. They will be required to do so, but they also will have the means to do so.

A Capabilities-Based Approach to the Future

The capabilities that will characterize joint warfare in coming decades, as described in Joint Vision, include—

- Joint C4ISR (command, control, communications, computers, intelligence, surveillance, and reconnaissance).
- Dominant maneuver.
- Precision engagement.
- Full dimensional protection.
- Focused logistics.

These capabilities, when combined, will achieve the goal of full spectrum dominance.

"Full spectrum dominance" is the term DOD uses to describe the ability to deter or defeat, if necessary, any conceivable adversary across the full range of military operations. Rather than focusing all efforts on the need to counter one well-defined opponent (the Soviet Union), which guided military thinking for 50 years, the concept of full spectrum dominance recognizes the military's need to deter and defeat the whole array of possible foes, both those known today and those that may emerge in coming years, in all possible scenarios.

Achieving and maintaining full spectrum dominance requires a new approach to designing our force structure, equipping our warfighters, and developing our doctrine. Instead of planning for the threat posed by a specific adversary (the Soviet Union) and the potential demands of specific theaters (such as Central Europe), full spectrum dominance calls for developing the capabilities needed to respond to any contingency anywhere in the world—a "capabilities-based approach" to warfare rather than a "threat-based approach."

According to the Focused Logistics Campaign Plan, this capabilities approach means that the military must—

> concurrently maintain our military advantages in key areas, develop new areas of military advantage, and deny asymmetric advantages to our adversaries. It entails adapting existing capabilities to new circumstances while experimenting with new capabilities.

A Full Partner in Joint Warfighting

The contributions of logistics to military success have been widely recognized throughout history. One needs only to recall those perhaps apocryphal sayings familiar to all logisticians: "Amateurs study tactics; professionals study logistics"; and "I don't know what this logistics is, but I want some of it" (sometimes attributed to World War II Chief of Naval Operations Fleet Admiral Ernest J. King). But the Focused Logistics Campaign Plan recognizes as never before that a strong partnership between logisticians and operators is now a vital requirement of warfighting success. In this plan, for the first time, "logistics has been formally designated a full partner in the joint warfighting process."

> *We must win the war on terrorism while rapidly improving our joint warfighting capability and laying the foundation for defense-wide transformation.*
>
> —Vice Admiral Gordon S. Holder, USN
> Director for Logistics, J–4
> The Joint Staff
> "Focused Logistics Campaign Plan"

If the full potential of focused logistics is attained, the results will benefit both operators and logisticians. Operators will experience—

- Faster deployments of mission-ready forces and their essential support to destinations specified by supported joint force commanders.
- A smaller, properly sized combat support and combat service support footprint in the combat zone.
- Reduced logistics costs, which will be realized without jeopardizing warfighting capabilities or readiness.

Logisticians, in turn, will gain—

- A more responsive, agile logistics support structure that can be supported from distant bases.
- More accurate and more timely logistics information.
- More reliable systems that are easier to support.

The improved efficiency, effectiveness, and speed of response resulting from focused logistics will increase the confidence of warfighters in their supporters and reduce sustainment requirements. Reduced requirements should decrease the size of the logistics footprint in theaters and diminish the vulnerability of logistics lines of communication to enemy disruption.

The future envisioned as the result of focused logistics is very attractive. But how will the potential of focused logistics be achieved? That question will be explored in subsequent articles in this series. The foundation of focused logistics rests on two initiatives: Logistics Transformation and the Future Logistics Enterprise. They represent the "building blocks" of focused logistics, and they will be the subject of an article in the September-October issue of *Army Logistician*. **ALOG**

—Story by Robert D. Paulus

JIM Lives at ALMC

ALMC is training soldiers and civilians for logistics missions in joint, interagency, and multinational environments.

Since its founding in 1954, the Army Logistics Management College (ALMC) has trained logisticians to operate in the Department of Defense (DOD) logistics system. After the Gulf War of 1991, ALMC placed a growing emphasis on logistics processes and procedures used in joint, interagency, and multinational (JIM) environments. It has done this by training logisticians for joint and multinational assignments and by educating logisticians from the other services, other agencies, and other countries. The recently published Field Manual 7–0, Training the Force, provides a doctrinal basis for JIM training.

Students come to ALMC from other Department of Defense activities and services, other nonmilitary Government agencies, and other countries. ALMC proponents, advisors, guest speakers, and even some of its instructors, are drawn from the JIM population.

Logistics Training for JIM Operations

Two ALMC courses instituted since the Gulf War specifically target the need to ready logisticians for JIM operations. These courses, both offered by ALMC's School of Logistics Science (SLS), are the Joint Course on Logistics (JCL) and the Multinational Logistics Course (MLC). Both are aimed primarily at O–4 and O–5 officers and GS–12 through GS–14 civilians who occupy or are destined for work in joint or multinational environments.

JCL is a direct legacy of the Gulf War, created to meet the need for training in support of joint operations. First offered in 1996, JCL is a 2-week resident course that focuses on operational-level joint logistics. It is designed to prepare officers and civilians for assignments in joint logistics planning, interservice and multinational logistics support, and joint logistics in a theater. The proponent for this course is the J–4 on the Joint Staff.

MLC is a more recent development, first offered last year. It provides mid-level military and civilian managers with an overview of multinational logistics at the operational level. The course's subject matter covers alliances (primarily the North Atlantic Treaty Organization), coalitions (including United Nations-initiated and ad hoc), and interagency operations. It incorporates information on the recently approved Joint Publication 4–08, Joint Doctrine for Logistics Support of Multinational Operations.

Interagency training at ALMC has two faces—those blocks of instruction that are provided as part of course curricula about interagency operations and those courses that are made available to interagency partners. The latter training has included customers from the Federal Bureau of Investigation (FBI), the Coast Guard, State environmental regulatory agencies, and even international staffs in Korea and Germany.

An Array of Defense Logistics Education

Another post-Gulf War development at ALMC is the Combined Logistics Captains Career Course (CLC3), which originated in 1993 as the Combined Logistics Officers Advanced Course. The purpose of CLC3 is to prepare logistics captains to command both functional and multifunctional companies and to serve in multifunctional logistics staff positions. Though CLC3 is intended primarily for Army captains, its students also include Marine Corps captains and international officers.

CLC3 is a 24-week course that has four phases. Phases 1 and 3 are conducted at ALMC, phase 2 at the branch schools, and phase 4 (which Marine Corps and international officers do not attend) at the Combined Arms and Services Staff School at Fort Leavenworth, Kansas. CLC3 specifically encourages the exchange of logistics knowledge and experiences among Army captains, Marines, and international officers.

Several ALMC courses that focus on DOD logistics predate the Gulf War. These include the Logistics Executive Development Course (LEDC), Defense Distribution Management Course, Defense Inventory Management Course, and Defense Regional Interservice Support Course. Since their inception, all of these have featured one of ALMC's two approaches to interagency training.

ALMC also has developed a lead role in environmental education in DOD. The DOD Interservice Environmental Education Review Board has designated ALMC's National Environmental Policy Act Implementation Course for Army and Marine Corps personnel and its Defense Hazardous Materials/Waste Handling Course for all of the services, the Coast Guard, and the FBI. Students from all of the services attend the Qualified Recycling Program Management Course, for which the DOD Recycling Group is the proponent.

DAU Partnership

One of the most significant developments at ALMC since the Gulf War has been the creation of the Defense Acquisition University (DAU) and ALMC's partnership

with it. ALMC has hosted DAU on its campus since March 2000, when much of ALMC's acquisition faculty and staff transferred to the university. The ALMC–DAU relationship was strengthened in June 2002, when ALMC established a satellite campus at the DAU South Region campus in Huntsville, Alabama. ALMC-Huntsville is the result of a decision to collocate the Army Acquisition Basic Course (AABC), conducted by ALMC's School of Systems and Acquisition Management (SSAM), with the large number of Army acquisition practitioners at Huntsville and the DAU campus providing advanced training. AABC is the basic training for new Army officers in functional area 51 and Army acquisition civilians, as well as international students involved in acquisition.

ALMC is participating in the development of a strategic partnership with DAU that also will include the Air Force Institute of Technology, Defense Contract Audit Institute, Defense Institute of Security Assistance Management, and Naval Postgraduate School. The partnership will lead to collaborations on curriculum, research, facilities, faculty, consulting, and e-learning, all designed to improve DOD acquisition and logistics training, professional continuing education, and graduate education.

Students from the other services attend SSAM's Operations Research and Systems Analysis Military Applications Course I (ORSA MAC I). This has resulted in the integration of more joint operations analysis into ORSA MAC I's 6-week Capstone Study exercise. SSAM faculty members also have developed basic analysis courses for both the Air Force and the Marine Corps.

Future Logistics Enterprise

DOD's Joint Logistics Board has developed six initiatives to accelerate DOD's implementation of integrated logistics chains and commercial warfighter sustainment needs to meet the operational requirements of the National Defense Strategy. ALMC is ensuring that these initiatives—depot maintenance partnerships, condition-based maintenance, total life-cycle systems maintenance, end-to-end distribution, executive agents, and enterprise integration—are taught in all applicable courses.

International Students

One of the distinctive features of the ALMC campus is the large number of students from other nations. These students gain an understanding of DOD and Army logistics and of basic logistics concepts and processes. They also become familiar with American society, institutions, and values through a program of tours, social functions, and local sponsors. The experiences of international officers also broaden the knowledge of U.S. students, who may find themselves someday working in multinational environments.

International students attend a wide variety of ALMC courses, including MLC, CLC3, LEDC, ORSA MAC 1, and AABC. Four international officers and an international contractor have attended the three MLC classes offered so far, and more than 800 international officers from 63 countries have attended LEDC over the years. Each year, about 70 international officers attend CLC3, 8 to 12 attend ORSA MAC I, and several attend AABC. In fiscal year 2003 to date, ALMC has enrolled 149 students from 53 countries.

The International Officers Logistics Preparatory Course was created after the Gulf War specifically to prepare international officers to attend LEDC and CLC3. Its purpose is to introduce international officers to U.S. Army concepts and processes so they will be ready for those ALMC courses. Over 100 international officers take the preparatory course each year.

International Faculty and Exchanges

Officers from the other services and other countries play a significant role as ALMC instructors. Currently, two Navy and two Air Force officers and three international officers serve on the ALMC faculty. The value of the international exchange officers can be seen in the fact that an Australian lieutenant colonel is the course director of LEDC, a Canadian major is the course director of MLC, and a British major is the director of instruction for CLC3.

International guest speakers are invited to address students in ALMC courses, particularly MLC, where lectures by such speakers are built into the curriculum. Speakers from nine countries, as well as all of the U.S. services, have addressed MLC.

ALMC meets annually with its corresponding training organization in the United Kingdom, the Royal Logistics Corps School of Logistics. The talks, known as the Logistics Information and Training Exchange (LITE), are designed to exchange training doctrine, information, and practices between the logistics training agencies of the two nations. ALMC also is working to develop a similar program with Canadian and Australian logistics training agencies.

ALMC's mission is to "provide quality products and services in acquisition, logistics, management science, environmental management and related subjects to the [U.S.] Army, Department of Defense, and to other eligible organizations [and to] improve the readiness and sustainability of [U.S.] Forces in joint and coalition operations through training, education, consulting, research, and selected information services." As the Army and DOD have changed since the first Gulf War, ALMC also has changed to meet the challenges of transformation.

As the pace of transformation accelerates, ALMC will continue to improve its ability to train logisticians for participation in JIM operations. Colonel Robert J. McNeil, the ALMC Commandant, believes that all members of the joint team need to know the full range of capabilities available to them. "ALMC is providing that information through JIM training," he said. "In addition, those who will operate together are training together, and they are developing an appreciation for one another's capabilities." **ALOG**

DLA: Logistics Backbone of Iraqi Freedom

by Major Susan Declercq Brown, USAFR, and Phyllis Rhodes

The impressive U.S. performance in Operation Iraqi Freedom demonstrated the success of many of the changes underway throughout the Department of Defense (DOD). Among the DOD elements that showcased their growing capabilities in the war was the Defense Logistics Agency (DLA), which is now DOD's largest combat support agency. As Major General Hawthorne J. Proctor, DLA's Director of Operations, commented, "If a soldier, sailor, airman, or marine eats it, wears it, fights with it, maintains their equipment with it, or in some manner burns it for fuel, DLA likely provided it." DLA's central role in logistics was amply exhibited in Iraqi Freedom.

By the end of April, DLA had processed nearly $61 million in requisitions; supplied about $3 billion in food, clothing, medical supplies, fuel, and spare parts; shipped nearly 30 million individual menu bags of meals, ready to eat (MREs); and provided more than 300 million gallons of fuel.

Iraqi Freedom also allowed DLA to display some recent innovations, including new business practices, greater logistician involvement in planning, technology for inventory tracking, and onsite battlefield coordination.

New Business Practices

The entire logistics and supply chain process has changed dramatically since the last Gulf war. Inventory management is not conducted like it was even a few years ago. Instead of managing large service and wholesale inventories, DLA now manages suppliers. Many of the warfighter's supplies now are shipped directly from manufacturers, distributors, and strategic suppliers.

According to Air Force Colonel Leonard Petrucelli, the chief of DLA Contingency Plans and Operations—

> We've gotten out of the business of warehousing huge mountains of inventories, but we still manage small hills of critical and high-demand items. We ensure the supplies are delivered straight to where the customer wants them, whether that's an office in Virginia, a pier in Kuwait, or an airfield inside Iraq.

Advanced Logistics Planning

Involving logisticians in the earliest planning also has contributed to the success of Iraqi Freedom. "What also helps us in this campaign is that we are now working hand in glove with the combat commanders and their planners to get out in front of the requirements, and that has been very beneficial because we have been in on the process early," Petrucelli noted. "That makes it easier to anticipate needs, and that is what you have to do to support a campaign like this."

In 1999 and 2000, DLA embedded liaison officers at each combatant command, such as the U.S. Central Command, and the Joint Staff. These liaison officers have been "instrumental in driving good logistics discipline and preparation by integrating DLA's core capabilities into the deliberate and crisis planning process early," observed Petrucelli. "You need to anticipate the logistics by working hard in the early planning stages. Working this closely with the combat commanders improves communications and puts everyone in a better position to plan and sustain requirements."

DLA has worked with the combatant commanders and planners to establish sustainment packages that focus on certain high interest items, such as force-protection barrier material and concertina wire. DLA sent those packages by surface transportation so they would arrive before the beginning of the Iraqi campaign, thus reducing the need for strategic airlift.

"Units normally deploy with their unit equipment and a specific number of days of supplies in their basic loads," said Petrucelli. "Once in theater, they begin requisitioning their follow-on sustainment requirements. In this situation, we simultaneously supported the unit's basic loads, their initial days of supplies as they departed the continental United States, and their sustainment needs. DLA's direct combat service support is projected to be $7 billion higher in 2003 from all these key logistics transactions."

☐ Trucks loaded with MREs and ammunition deliver support to Marine combat units in Iraq.

Throughout the advanced planning process, DLA identified sustainment requirements for the numbers and types of military forces allocated in the war plans. DLA encouraged the armed services to submit their requirements early to ensure that all needs were met.

For Operation Iraqi Freedom, distance was the biggest challenge that DLA had to overcome. Contingency support for troops must begin before the conflict, which means demands for clothing, medicines, food, fuel, and construction materials will begin before the troops deploy. Once the conflict begins, large quantities will be needed to sustain the thousands of troops in theater. Typically, a supply pipeline is built.

According to Petrucelli—

> You really have to look at [the supply pipeline] as a pipe with a constant flow of water. You want to control the flow so you don't overwhelm the ports or create an unnecessary need for air shipment. Logistics is often framed as both an art and a science. But joint logistics is definitely an art when you're dealing with services' idiosyncrasies such as feeding plans, fuel consumption, and water requirements. You don't want all 100 days worth of food, fuel, and medicines there because you don't want all your eggs in one basket, to have supplies in the wrong place, or burden the services with managing the additional movement and storage needs. You want to synchronize the flow to sustain a steady state of production . . .

Improved Visibility Through Technology

DLA places radio frequency identification tags on containers to track them in transit and make them easier to find. The visibility provided by the tags allows DLA to meet changing requirements by shifting containers to where they are really needed. Improved visibility "has been very helpful," said Petrucelli. "It makes it easy for the customer and the deployed DLA contingency support teams in the area of operations to track their property and anticipate delivery. That cuts down on reorders."

Onsite Battlefield Coordination

Another great tool used in Operation Iraqi Freedom is the DLA contingency support team (DCST). A DCST is a total force package of active duty and Reserve component military personnel and civilians assigned to DLA from all of the services. DCSTs deploy to the theater of operations and work closely with the logistics planners there. They are the main logistics cell in theater, deployed to help expedite sustainment requirements. In April, DLA had more than 70 people in the Iraqi theater of operations, about 30 percent of whom were Army personnel.

In Operation Enduring Freedom in Afghanistan and Operation Iraqi Freedom, the DCSTs gave the U.S. Central Command the logistics information it needed for decisionmaking. The teams provided information on the products and services available from DLA, which the services could use to make ordering decisions to support changing operations. The DCSTs also helped track property when it arrived in theater.

As the fighting winds down, DLA's support mission in Iraq has not ended. In addition to providing full-service logistics; 100 percent of fuel, protective clothing, and medical supplies; and nearly all of the construction material critical to force protection, DLA also is performing a critical role in humanitarian assistance to Iraqi citizens.

DLA procures and stores humanitarian daily rations (HDRs) for the Department of State and ships them to the region as required. In March, DLA already had delivered to the region over 2.4 million HDRs—enough food to feed the entire population of St. Paul, Minnesota, 3 meals a day for 8 days. One HDR is designed to feed one refugee for an entire day. HDRs are used to feed refugees until they reach a refugee camp.

DLA will continue to support humanitarian relief until nongovernmental aid can assume the mission. DLA also has gained responsibility for cleaning up the battlefields, including removing equipment, debris, and hazardous materials. And, as the supplier of 90 percent of DOD's replacement parts, DLA will see a surge in requisitions as vehicles and weapon systems are returned to home stations in need of long-deferred routine maintenance. The combat may be over, but DLA continues to support.

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A Logistics Common Operating Picture for Millennium Challenge 2002

by Harry E. Waters

Information Age technologies are changing the way the joint force collects, processes, disseminates, and displays information. New command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) technology provides combatant and joint task force (JTF) commanders with a common relevant operating picture (CROP), or situational awareness, of the battlespace. The CROP enhances operational and tactical command of joint forces across the full spectrum of conflict and enhances survivability, lethality, and mobility.

The CROP for Millennium Challenge 2002, which was conducted last summer at the Joint Training and Analysis Center in Suffolk, Virginia, included a logistics common operating picture (Log COP) display. The Log COP emulated a technical capability envisioned for 2007 that will be able to find and present only the most relevant information that logisticians need to make informed decisions and act speedily.

The Experiment

Millennium Challenge 2002 (MC02) was the Nation's premier joint integrating event that brought together live field exercises and computer simulations. Sponsored by the U.S. Joint Forces Command, MC02 focused on how to wage rapid, decisive operations against a determined enemy existing in 2007. The individual services also folded their specific transformation experiments into MC02 and evaluated a number of emerging joint concepts, objectives, warfighting challenges, and technologies to support the joint force in an upper-end, small-scale contingency.

In preparation for MC02, the U.S. Joint Forces Command Joint Logistics Transformation Center developed a joint vision of a fully integrated information presentation that would provide situational awareness and operational planning assistance to the warfighter. That vision was the basis for the MC02 Log COP display.

Transformational Log COP Display

The transformational Log COP display presents timely, integrated, accurate, and relevant information that is tailored to meet the combatant and joint force commanders' requirements. Its purpose is to display common information for every organization at every echelon and to provide a common situational understanding and awareness across the logistics community vertically (through echelons) and horizontally (across functions and components).

The Log COP display is a Web-based, "information-centric" environment that contains a virtual warehouse of data and joint logistics decision support tools. Sophisticated information management and dissemination tools reveal dynamic, shareable, real-time, actionable information. Once the Log COP is fully developed, individuals at each echelon will be able to access all of the data and update information directly from their locations.

In an operational environment, the combatant commander's staff logisticians will build an initial Log COP for each of the regional combatant commander's focus areas. The initial Log COP is based on concept plan information. The objective is to have an initial Log COP on the shelf ready for any contingency operation within the commander's theater. With a Log COP designed and built before activation of a JTF, the commander can use it to the best advantage and gain control of the logistics pipeline early. During crisis action planning and execution, the combatant command Log COP is updated continually and is available to the JTF and service or functional components for use and refinement. (A functional component is a command normally composed of forces of two or more military services that is established across the range of military operations to perform particular operational missions.)

The MC02 Log COP was developed using the Joint Logistics Transformation Center's Log COP vision as a guide and the Share Point Portal Server (SPPS) from the Experimental Command, Control, Communications,

Computers, and Intelligence (XC4I) System as the software application. The SPPS is a new Intranet application from Microsoft that allows users to store, search, and manage documents. With SPPS, users can develop their own unique common operating picture.

During MC02, the designated "knowledge manager" provided the basic SPPS pages to the primary participants from the combatant command, the JTF, and service or functional components. The logisticians took on the task of customizing an SPPS page to use as the Log COP.

Log COP Operations

The MC02 Log COP provided users access to current relevant logistics data, information, and tools. The one-page Log COP portal had four sections: the Log Watchboard, the Tools Section, the Workspace and Map Section, and the Information Section. The displays in each section were based primarily on the information and tools essential to logisticians.

The Log Watchboard provided near-real-time monitoring of the flow of critical classes of supply across critical nodes and lines of communication.

☐ A soldier checks the Multiple Integrated Laser Engagement System strips on his Stryker armored vehicle before participating in Millennium Challenge 2002.

The Tools Section contained a full range of integrated decision support tools and joint information systems that provided visibility, planning, and a course of action analysis for the joint theater logistics manager. Among the "tools" available were the Global Combat Support System, Global Command and Control System, Global Transportation Network Exercise System, Joint Total Asset Visibility, Joint Forces Capability Register, Joint Logistics Tools, Port and Airfield Collaborative Environment, Integrated Consumable Item Support Module, Logistics Planning Generator, and Transportation Distance Planning Tool. The Joint Operational Planning/Execution System, Joint Flow and Analysis System for Transportation, Sustainment Generator, and Theater Medical Information Program also were available to MC02 logisticians but not directly through the Log COP.

The Workspace and Map Section provided integrated collaborative tools, which enabled real-time planning and execution from one end of the pipeline to the other, and a common operating picture, which provided operational situational awareness along with relevant port and infrastructure data. Planning information stored in this section included aircraft bed-down sites, combatant command distribution and support plans, component links, U.S. Transportation Command and Defense Logistics Agency links, and map Web sites such as the National Imagery and Mapping Agency.

The Information Section provided current data for various logistics functional areas. Relevant common information was stored, displayed, and archived there for access by multiple users, which reduced the need to maintain the same information at several locations while increasing overall system efficiency and reducing bandwidth requirements. Information stored there included strategic airflow schedules, ship manifests, and data on strategic-sustainment cargo flights, common-user land transportation assets, pre-positioned stocks afloat, planned contract support, and available host nation support.

During MC02, all joint effects-based planning meetings were held in a collaborative information environment. (At the operational and tactical levels, "effects-based planning" means that the desired effects, not the identification of targets to attack, guide planning. Planners derive targets from the desired effects, not the other way around.) The relationship between development of the course of action and planning for deployment started with the assignment of effects-based missions from the prioritized effects list to the service or functional components. The components, collaborating with the JTF, developed their courses of action and selected the best means to accomplish the assigned tasks. The JTF synchronized and sequenced the force flow based on the prioritized effects list and

time-phased force and deployment data.

As planning progressed, the prioritized effects list, course of action, and all of the deployment and employment data were kept current and available on the Log COP. Resulting products, such as a logistics staff estimate and logistics and transportation feasibility assessments, became part of the logistics portion of the effects tasking order and also were posted on the Log COP.

After the first effects tasking order was published and execution began, the process became iterative and the Log COP became the source of all execution and planning materials. For example, the engineers continually updated the distribution plan as road conditions and transporters changed and as requirements and destination shifts occurred. The Log COP was the central location for a single, real-time plan, prepared and maintained by several different functional area logisticians for warfighters.

The Logistics Action Response Board, a JTF-level board composed of key logisticians from the combatant command, the JTF, and the service or functional components, was tasked to ensure a smooth and complete exchange of information; achieve synchronized sustainment, employment, transportation engineering, and medical operations; and address issues that exceeded the ability of routine staff work to resolve. Relevant common information about the board, including its daily schedule, agenda, current issues, and meeting minutes, was posted on the Log COP.

Future Collaborative Information Environments

During MC02, the participating logisticians assessed the Log COP by responding to a questionnaire about navigation, features, utility, and layout. Feedback from all levels was positive.

One of the greatest single challenges in the development of a Log COP is ensuring that its basic structure is common across all the regional combatant commands, JTFs, and service or functional components. This eliminates the need for many disparate systems that do not communicate with each other and establishes common points for planning and decisionmaking. The concept for a Log COP begins with a clear understanding of the warfighters' logistics information needs and includes the capabilities of the various logistics functional areas to provide information (always keeping in mind that access is never more than "two clicks away"). A standard design also reduces training requirements when users transfer from location to location.

The MC02 Log Watchboard emulated a year 2007 real-time reporting system. Although the reporting system was technologically limited during MC02, the conceptual requirement for the Log Watchboard was validated. An enterprise solution that embraces all of the services is needed now to make the Log Watchboard viable in the future. Many of the data sources and tools also require separate passwords and public key infrastructure authorization. Log COP must be a one-password system.

Through a great deal of collaboration, the participants in MC02 refined and improved the Log COP. The MC02 Log COP, which continues to evolve, is the prototype for future collaborative information environments.

The final Log COP, expected to be available during the 2020 to 2025 timeframe, will—

- Provide visibility of all personnel and assets in the pipeline.
- Eliminate separate logistics reporting.
- Automatically generate and assess supply requirements.
- Gather and manipulate information.
- Allocate optimal routes and carriers.

The Log COP will enable seamless information processing and will have multilevel security partitioning so allied and coalition forces can participate. It will compare information from disparate sources and resolve inconsistencies and ambiguities before they become actionable. The Log COP of the future will be able to project actions or activities 48 to 96 hours in advance.

The joint planning and execution community should support an effort headed by the Joint Staff, J–4; the U.S. Transportation Command; the Joint Deployment Process Office; and the Joint Logistics Transformation Center to continue development of the Log COP. Every possible venue should be explored to gain information on applications and technologies that would further its maturity and get it into the hands of the regional combatant commanders. **ALOG**

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What Army Logisticians Should Know About the Marine Corps

by Lieutenant Colonel James C. Bates, USA (Ret.)

Joint task force logisticians who understand the logistics methods and capabilities of the U.S. Marine Corps can enhance the effectiveness and efficiency of logistics operations. This is especially important when one considers that accessing international seaports and foreign shores and providing security for forces transiting through them are ever-increasing concerns of military planners. As a result, joint logistics over-the-shore operations, which require both Navy and Marine Corps and Army forces, most likely will become more prevalent in the future, in both forced and permissive-entry environments.

This changing operational environment means that Army logisticians should be familiar with Marine Corps logistics. What follows is a brief overview of how the Marine Corps conducts logistics, with a specific emphasis on its logistics structure and doctrine. Soldiers serving as joint logistics planners should recognize the synergies involved in Army and Marine Corps operations and should work to streamline combat service support. Moreover, just as other services, agencies, and countries can learn from understanding U.S. Army logistics, the Army can adapt and improve its logistics processes by understanding and incorporating methods from others, like the Marine Corps.

☐ At Marine Corps Logistics Base Albany, Georgia, technicians test a light armored vehicle in the test pond located near the maintenance center.

Components of Joint Task Forces

U.S. military operations, regardless of whether they are small-scale peacekeeping operations or major regional conflicts, involve joint forces (provided by the Army, Navy, Air Force, and Marine Corps) and are conducted under the overarching control of a regional combatant commander—formerly called a commander in chief—from either the U.S. Pacific Command, U.S. European Command, U.S. Central Command, U.S. Northern Command, U.S. Southern Command, or, in some instances, the U.S. Special Operations Command.

The regional combatant commander appoints a joint task force commander, who directly oversees a joint task force (JTF). While the makeup of a JTF can vary (it could have service-specific subordinate commands, for example), it sometimes is composed of an air component command, a maritime component command, a special operations component command, and a land component command. The services provide forces to these component commanders. Typically, the Army and the Marine Corps constitute the land component command. Since these two services operate in the same area of operations, logisticians of one service might be able to use some of the combat service support assets of the other service in addition to their own; they also might tap into the logistics capabilities of joint, interagency, and multinational activities.

Marine Corps Force Structure

Like the Army, the Marine Corps has both an administrative and a deployed organizational structure. There are approximately 173,000 marines on active duty and 100,000 Marine Reservists; there are no Marine National Guard forces. In comparison, the Army has approximately 485,000 active-duty soldiers, 360,000 National Guardsmen, and 200,000 Army Reservists.

The Marine Corps has three active Marine divisions (each with about 18,000 marines), three active Marine aircraft wings (each with about 15,000 marines and 300 aircraft), and three force service support groups (FSSGs), which have about 9,000 marines each. The FSSG is a permanently structured command consisting of eight battalions whose mission is to provide combat service support to Marine Corps forces worldwide.

Marines deploy as a Marine air ground task force (MAGTF), with marines providing their own aviation support. A MAGTF includes a command element, a ground combat element, an aviation combat element, and a combat service support element (CSSE).

MAGTFs deploy in three configurations: a Marine expeditionary force (MEF); a Marine expeditionary brigade (MEB); or a Marine expeditionary unit (MEU) special operations capable (SOC). As a general rule, an MEF has 50,000 marines and is commanded by a lieutenant general; an MEB has 16,000 marines and is commanded by a brigadier general; and an MEU has 2,200 marines and is commanded by a colonel.

An MEF consists of one or more of the following: an infantry division, which consists of three infantry regiments (with a total of nine infantry battalions in the division); an artillery regiment (with four artillery battalions); a tank battalion; a light armored reconnaissance battalion; an amphibious assault battalion; a Marine aircraft wing, which provides both fixed-wing and rotary-wing aircraft; and an FSSG.

The Marine Corps has three MEF's: the I MEF is located on the U.S. west coast, the II MEF is located on the east coast, and the III MEF is located in Okinawa, Japan. Each of the MEFs has an MEB (the 1st MEB, the 2d MEB, and the 3d MEB, respectively). There also is a 4th MEB (Anti-terrorism), activated in September 2001, that provides antiterrorism support to regional combatant commanders worldwide.

Marine Corps Logistics Structure

The MAGTF's CSSE provides supply, maintenance, transportation, general engineering, health services, and services. Services include personnel administration; religious ministries support; financial management; disbursing; communications; billeting; messing; military bands; morale, welfare, and recreation activities; postal services; exchange services; security support; legal services; civil affairs; and graves registration.

Normally, there is one CSSE for each MAGTF. An FSSG is the CSSE that supports an MEF. A brigade

QUANTITY	ITEM
5.2	Million gallons of cargo fuel
2,174	50,000-pound cargo containers
76	TOW missile launchers
24	Light armored vehicles
105	Amphibious assault vehicles
30	M1A1 tanks
30	155-millimeter howitzers
123	Electrical generators
1	Field hospital (200 beds)
14	50,000-pound container handlers
8	25-ton cranes
16	7.5-ton cranes
47	Floodlight sets
7	Tactical airfield fuel dispensing systems
6	Motorized road graders
4	Wheeled scraper trackers
104	3,000-gallon collapsible fabric tanks
50	Tractors (various types)
107	Forklift trucks (various types)
41	Reverse osmosis water purification units
203	Cargo trailers
89	Powered trailers (various types)
282	5-ton cargo trucks
42	5-ton dump trucks
22	5-ton wrecker trucks
530	Cargo/troop carriers (HMMWV)

☐ This chart lists some of the equipment and supplies on the ships of one Maritime Pre-positioned Ship Squadron.

☐ A mechanic with the 2d Marine Expeditionary Brigade on the *USS Bataan* inspects the engine of an AV–8B Harrier jet as part of a daily check of the plane's readiness.

service support group (BSSG) is the CSSE that supports an MEB. A Marine expeditionary unit service support group (MSSG) is the CSSE that supports an MEU.

Maritime Pre-positioning

Also supporting the MEFs is the Maritime Pre-positioning Force, which is operated by the Navy's Military Sealift Command. The Maritime Pre-positioning Force currently is composed of 14 maritime pre-positioning ships that carry nearly all of the equipment and supplies deploying marines need to conduct operations. The Maritime Pre-positioning Force is divided into three Maritime Pre-positioning Ship Squadrons (MPSRONs). MPSRON One is usually on duty in the Atlantic Ocean or Mediterranean Sea. MPSRON Two is usually located near the island of Diego Garcia in the Indian Ocean. MPSRON Three is usually stationed near Guam or Saipan in the Western Pacific Ocean.

When MPSRON ships are needed, they transport their equipment and supply loads to a relatively secure environment for offloading either in port or at sea. Deploying marines, normally arriving at nearby airfields, offload the supplies and equipment from the MPSRON. One maritime pre-positioning ship can support an MEU. One MPSRON (four to five ships) can support an MEB for 30 days. All three MPSRONs combined (14 ships) can support an MEF. The chart at left shows a partial list of the impressive amount of supplies and equipment found on the ships of one MPSRON.

Wholesale-Level Logistics and Research

Like the Army, the Marine Corps, in conjunction with the Navy, is in the process of transforming itself in order to exploit our Nation's technological and doctrinal advances. Concepts associated with the Operational Maneuver from the Sea vision include enhanced joint, sea-based capabilities that will use high-speed support vessels, floating forward staging bases, and Maritime Pre-positioned Force-Future ships. These future assets will provide platforms where troops can marry up with their equipment, both during deployments and during periods of reconstitution. A floating logistics base provides several advantages. It can remain safely over the horizon until needed; it can be moved relatively quickly to other locations, such as sparsely defended enemy coastal areas; and it can reduce the amount of supplies and equipment needed ashore, thereby expediting the redeployment process at the tactical level.

At the strategic level of supply, the Marine Corps oversees the Marine Corps Materiel Command (MATCOM). Similar in purpose but smaller in size than the Army Materiel Command, MATCOM commands the Marine Corps logistics bases at Albany, Georgia (site of MATCOM Headquarters), and Barstow, California. Blount Island, Florida, is a Marine Corps depot subordinate to the logistics base at Albany.

MATCOM also oversees the Marine Corps Systems Command (MARCORSYSCOM) at Marine Corps Base Quantico, Virginia. MARCORSYSCOM's mission is to provide life-cycle management of Marine Corps ground weapon systems, equipment, munitions, and information systems to ensure materiel readiness of its forces in the field. It serves as the principal agent for equipping marines for their warfighting mission.

To learn more about Marine Corps logistics doctrine, visit the 4-series Marine Corps Warfighting and Reference Publications at https://www.doctrine.usmc.mil/htm/doc9.htm. The Marine Corps offers formal logistics training at the Marine Corps Combat Service Support Schools (MCCSSS), which are located at Camp Johnson, 5 miles from Marine Corps Base Camp Lejeune, North Carolina. The schools provide combat service support training for marine officers, noncommissioned officers, and junior enlisted personnel. Its Web site is www.lejeune.usmc.mil/mccsss/schools.htm.

As the Department of Defense and the armed services transform into an ever more efficient military force through the use of advanced joint doctrine and warfare, those Army logisticians who understand the implications and potential for interservice logistics planning and operations will be in a better position to have a positive influence on future combat service support. Soldiers must know all about their comrades in arms in the Marine Corps. **ALOG**

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FLEs: What Are They and Why Do We Need Them?

by Major Michael W. Snow

Offensive operations must have flexible logistics organizations that can provide continuous support to help maintain the momentum of the offense. Most forward support battalions (FSBs) quickly find themselves 20 to 25 kilometers behind the forward line of own troops (FLOT), which is out of position to support the increased lines of communication. It is at this point that leaders in the brigade and FSB conclude that they must organize and deploy a forward logistics element (FLE) to support the mission.

The FLE often has difficulty supporting the mission because tactical logisticians and maneuver planners lack a firm understanding of how best to organize and employ it to support brigade-level operations. Unfortunately, Army doctrine offers little to assist them. Logistics planners struggle to analyze the mission properly, and they have difficulty getting the assets the FLE needs and performing the proper time-distance analysis required to accomplish the mission.

Throughout the 16 rotations at the National Training Center at Fort Irwin, California, for which I have served as a support operations officer observer-controller, I have seen only a handful of units execute an FLE successfully. I attribute their successes to an understanding of three basic principles.

Definitive Plan

First, a successful FLE must be included in the overall plan. Field Manual (FM) 101–5–1, Operational Terms and Graphics, defines an FLE as a multifunctional element that is task-organized to support fast-moving offensive operations, early phases of contingency operations, and units that are geographically separated from normal support channels. This implies that planners must analyze a mission, identify any shortfalls in capabilities or requirements, and then task-organize assets to mitigate the shortcoming and accomplish the task. Key points to remember about the FLE are that it consists of more than one logistics capability, such as class IIIB (bulk petroleum), maintenance, or combat health support, and that it is task-organized.

Brigade-level planners, specifically the brigade S–4 and FSB support operations officer, must provide the FLE a clear task and purpose during the brigade military decisionmaking process. Planners should use running estimates and synchronization matrices to identify triggers for action and integrate the FLE into the maneuver plan. Subordinate unit leaders then will have time to plan, conduct precombat checks and inspections, and rehearse before battle execution.

Task and Purpose

Second, a successful FLE has a clear task and purpose at deployment. The decision to use an FLE instead of some other type of support is based on a time-distance analysis, the capabilities or requirements shortfall, or the battlefield geometry analysis performed during the decisionmaking process.

During the planning process, logisticians develop a concept of support that is based on the brigade's scheme of maneuver and integrate the combat service support (CSS) battlefield operating systems (BOS) to ensure that the concept of support meets the maneuver commander's intent. The decision to move an FLE is based on the time and distance of the proposed mission. Planners develop triggers that initiate action to support the movement and ensure that critical support is available when needed.

FSB commanders may choose to use an FLE when echeloning the brigade support area. FM 3–90.3, The Mounted Brigade Combat Team, says that the FSB commander may support the tactical plan by moving the FSB within the brigade combat team formation, by providing critical CSS direct support assets to maneuver units, by relocating the FSB as an entity, or by echeloning it forward in increments. The FM highlights the fact that, in order to maintain support while relocating as an entity—an event that normally takes 6 to 10 hours—the FSB may use an FLE to provide support. The FLE echelons forward, establishes operations, and supports brigade elements while the FSB moves. Before making the decision to use an FLE, planners must examine the brigade's entire battlespace, perform a time-distance analysis, and establish triggers that will help carry out the mission.

The FSB commander also may use an FLE to support specific mission requirements outside the brigade support area. Based on subordinate unit operations within the brigade, the support operations officer may identify a need to

support brigade-specific tasks. The FSB then can deploy an FLE that has the capability to accomplish a specific task for a specified duration. When the mission is completed, the FLE returns to the brigade support area.

Written Procedures

The third principle of successful FLE use is that a unit follows standing operating procedures (SOPs) or tactics, techniques, and procedures (TTP). Unfortunately, most units do not address FLE structure and execution adequately, if at all, in their SOPs or TTP. Even though no two FLEs will look alike because of different missions, tasks, and purposes, every FLE's organizational structure has three basic components: command and control, a capability to provide multifunctional support to a specified task and purpose, and security.

Planners must resource adequate command and control assets forward as part of an FLE. No matter the size or the mission, an FLE must be able to maintain situational understanding of current and future operations. Depending on the task and purpose of the FLE, the command and control structure might have to replicate the brigade rear command post or monitor only a supported task force net. The FSB also must allocate appropriate leadership to oversee operations.

The FSB SOP or TTP should provide the fundamentals for determining the appropriate command and control structure for an FLE. The FSB support operations officer and executive officer then will be able to provide the FSB commander a recommendation based on guidelines in the FSB SOP or TTP. Depending on the size and composition of the FSB, its commander, the support operations officer, or a company commander may be required to provide command and control. The SOP or TTP also must include information on how to determine an appropriate command and control structure by integrating the brigade S–1 and S–4 and other members of the brigade rear command post into it.

Planners must task-organize multifunctional support based on estimated mission requirements. They must consider the dimensions of the battlespace, understand organizational and direct support logistics requirements, and allocate the resources needed to carry out the mission. Based on the planners' analysis, logisticians must echelon a minimum number of logistics assets forward to accomplish the mission. To create a true brigade-level FLE, the brigade S–4 and support operations officer must integrate task force support elements with FSB assets, which requires them to understand the TTP used at the task force level. Supported units must echelon organizational logistics assets forward with the direct support assets to maximize the effectiveness of the FLE.

Security is the last component of a successful FLE. Whatever the size of the element sent forward, the parent unit—specifically the FSB—must allocate applicable crew-served weapons, request military police support to defend against level I or II threats, or ask for a tactical combat force when the threat warrants.

Doctrine Shortfalls

Doctrine does little to assist planners in their efforts to employ an FLE. FM 100–10, Combat Service Support, the Army's capstone logistics FM, describes an FLE as "an organization echeloned forward on a temporary basis to provide critical support in order to reduce the lines of communication based on the tempo of the operation or security considerations." This manual does not provide readers with FLE time-distance analyses, tasks and purposes, or other essential elements of a successful FLE employment. The final draft of FM 4–0, Combat Service Support, which will replace FM 100–10, does not refer to FLEs and their employment. FM 63–2–1, Division Support Command, Light Infantry, Airborne, and Air Assault Divisions, is the only other FM that addresses the use of an FLE for offensive operations. FMs 17–95, Cavalry Operations; 71–100, Division Operations; and 71–100–3, Air Assault Division Operations, provide some discussion of FLEs and their use; however, these manuals are not usually found in a brigade logistician's kit bags. Finally, FM 3–90.3, The Mounted Brigade Combat Team; and Army Readiness and Training Evaluation Program (ARTEP) 71–3–MTP, Mission Training Plan for the Mounted Brigade Combat Team, identify the FLE as a tool that brigade logistics planners use to ensure continuous support of brigade operations.

Some argue that FLE operations are inherently impromptu or ad hoc; the brigade staff therefore can capitalize on the logistician's well-known flexibility and proven ability to improvise on demand. It is not unusual for FSB commanders to throw together logistics assets in support of a brigade-level operation and be content with ambiguous "tasks to subordinate units" buried in the brigade order. These tasks generally have no clear purpose and lack executable details. Logisticians will always have to react to unexpected requirements. However, active participation by logisticians in the planning process improves their ability to understand the mission, allocate available resources, and synchronize the CSS BOS within the brigade's battlespace. More importantly, when logisticians participate in the process, any gaps in the logistics infrastructure are more likely to be pinpointed and closed.

An FLE can help the FSB commander provide the uninterrupted and continuous support required for fast-paced offensive operations. However, brigade-level logistics planners must understand what an FLE is before they can employ it effectively. **ALOG**

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Modular Storage and Transportation Containers

by Harry C. Ludwig, David Cheek, and David Branson

The Army and the Defense Logistics Agency join together to configure containerized loads of repair parts for the Army Pre-positioned Stocks program.

The modular storage and transportation (MS&T) container is a side-loading, intermodal ISO (International Organization for Standardization) container with interchangeable module inserts that can be tailored to meet specific unit storage and operational needs. Last year, a joint effort by the Army and the Defense Logistics Agency (DLA) used MS&T containers to containerize repair parts and assemblies for the Army Pre-positioned Stocks (APS) program.

The Army-DLA containerization effort, which took place during the third and fourth quarters of fiscal year 2002, included the consolidation of authorized stockage list (ASL) and prescribed load list (PLL) materiel supporting the APS program at the containerization consolidation point (CCP) located at Defense Distribution Depot Susquehanna, Pennsylvania (DDSP). The materiel was containerized in commercial-off-the-shelf (COTS) MS&T containers known as the Field Pack-Up (FPU) System of containers and modules manufactured by Boh Environmental, LLC, of New Orleans, Louisiana. These products were purchased by the Army and delivered to the DDSP CCP, where they were uploaded and then shipped.

Value of MS&T Containers

The Army continues to find ways to move supplies and equipment faster and more efficiently while reducing the materiel-handling burden on the soldier in the field. It is critical that materiel be delivered where needed, when needed, and in the quantities needed and that it be readily tracked and available for use at all times. The Army's goal is to optimize logistics support to the soldier by increasing throughput, minimizing handling, reducing the logistics footprint, and physically speeding the flow of supplies to the consumer. The consolidation and shipment of materiel as a unit-specific configured load, stored and transported in MS&T containers, is one step toward accomplishing that goal.

The MS&T containers are significantly more versatile than one-dimensional or fixed-configuration containers. While the sideloading outer frame of the MS&T container is constructed to meet a single, consistent ISO standard, the interior modules can be constructed in many different designs or configurations tailored to meet the needs of the user. The modules are fully interchangeable with each other so they can be used and secured in place, without the need for blocking and bracing, in any of the MS&T containers. This flexibility makes the delivery of supplies and equipment throughout the supply chain easier, especially when delivery of smaller packages is required and the use of a single, larger container would be inefficient.

Once the modules are fully loaded with supplies, they can be used as mobile warehouses to support daily

☐ **Two 20-foot MS&T containers on a flatbed trailer.**

☐ **Forklift handling a 20-ft MS&T container.**

operations. The modules do not require any additional preparation for transportation; they can be uploaded to the containers and readied for movement or deployment in minutes. Fully loaded containers can be transported using virtually any commercial or Army transportation method that can support the movement of 20-foot-equivalent-unit (TEU) ISO containers. The inner modules can be removed easily from the outer container with a forklift and then transported separately or exchanged with other modules in other containers already at the delivery point.

The containers provide the Army with the capability to store literally thousands of individual repair parts and line items in specific compartments, modules, and containers and assign each individual part a unique location that can be tracked in the Army's automated systems. This allows each part to be readily located and accessed during all phases of storage and transportation.

ASL Mobility System

MS&T containers have been purchased to support ASL and PLL containerization and movement for the Stryker brigade combat team (SBCT) and APS programs. The Army's Deputy Chief of Staff, G–4, and the Army Logistics Integration Agency (LIA) orchestrated the purchase and fielding of FPU containers to SBCT–1 and SBCT–2 for ASL containerization.

The FPU container meets many of the key performance parameters of the ASL Mobility System (ASLMS) that the Army is developing. The ASLMS provides a system of specialized TEU ISO storage containers designed to fully containerize class IX ASL repair parts. It is intended to support Legacy, Interim, and Objective Force distribution-based logistics by providing a more rapid strategic deployment capability, better mobility on the battlefield, and a standardized, efficient means of storing, issuing, receiving, distributing, and controlling ASLs.

The Army intends to field the ASLMS as a table of organization and equipment item to supply support activities throughout the force to enhance storage and distribution of class IX ASL repair parts on the battlefield. The first-unit-equipped date of the ASLMS is projected to be the third quarter of fiscal year 2004. The Army Product Manager Force Sustainment Systems awarded the ASLMS contract to Boh Environmental, LLC, on 27 November 2002.

Container Purchase

The effort to containerize APS repair parts and assemblies using the COTS FPU containers offers an interesting case study in Army-DLA collaboration.

The effort began when the Department of the Army staff that oversees APS determined that the APS program could benefit from using MS&T containers and directed the purchase of FPU containers. The containers were purchased by the Army Materiel Command (AMC) in support of the APS–5 program as part of a joint effort with DLA. Materiel requirements were coordinated among AMC's Field Support Command (FSC) and Soldier and Biological Chemical Command (SBCCOM) and LIA. These requirements were included in the purchase request from SBCCOM to DLA's Defense Supply Center Philadelphia, where the contract for the containers was awarded.

The FPU containers and their inner storage modules were delivered to DDSP, where the modules were fully uploaded with ASL and PLL repair parts that had been pre-positioned for the effort. The fully loaded modules then were loaded into 20-foot FPU containers and

shipped by truck to a continental United States (CONUS) port for transportation by ship to an outside CONUS location.

Repair Parts Storage Requirements

To determine the best configuration of the inner storage modules that would be purchased, representatives from FSC and LIA reviewed the list of ASL and PLL repair parts that were to be containerized. This was no small task, because the list contained literally thousands of repair parts in 1 ASL and 26 separate PLLs that were to be containerized into thousands of individual compartments in various-sized drawers. The goal was to configure the modules with the right numbers and sizes of compartments needed to store the materiel on the list.

A review of existing FED LOG data for the items to be containerized indicated that much of the dimensional data needed to determine the size of the repair parts was missing or incomplete. Since the FSC and LIA representatives lacked a complete and valid dimensional database and the time to do a physical review of all of the pre-positioned repair parts, they decided to configure the modules with drawers and compartments that offered a wide array of sizes; this would provide the flexibility to containerize virtually any size repair parts, including hazardous material and bulk stocks.

The purchase request was developed to include modules with 8 different configurations containing a total of 255 drawers of various sizes, ranging from 4 inches to 16 inches and including bulk stocks drawers. The eight separate module configurations each consisted of a fixed number of specific-sized drawers. Each drawer was configured with a variable number of compartment sizes that could be adjusted as needed. These drawers were configured to provide a total of 4,396 separate storage compartments of various adjustable sizes.

Additional drawer dividers were purchased to make further adjustments to compartment sizes, thus potentially adding several hundred additional compartments as needed. Several bulk storage modules also were purchased to store some of the larger items on the ASL and PLL repair parts lists. All of these modules were designed to fit interchangeably into any of the six 20-foot FPU containers that were purchased.

Representatives from FSC and LIA met with DDSP to review the process that would be used to load the FPU containers and modules. Each individual storage compartment required a unique 9-digit number that represented the compartment's location for tracking. Each item in a unit's ASL and PLL was cross-referenced to a specific location that identified the container, module, drawer, and compartment where the item was stored. Once materiel is stowed, this capability will significantly reduce the time it takes for an item to be located and retrieved for issue or use.

Under ideal circumstances, each Army unit identification code (UIC) should have modules configured with a number of compartments equal to the number of unique national stock numbers (NSNs) to be containerized, and each compartment should be sized to contain the entire quantity of the specific NSN it will store.

Container Loading

Although there were some funding and contracting hurdles to overcome, the FPU modules and containers were delivered to DDSP as scheduled. The module and container stuffing process was completed on time. Because of the relatively short operational timeline and the complexity of the module stuffing process, FPU inner storage modules were delivered several weeks before the FPU containers. This provided DDSP additional time to size and place repair parts into the compartments of the modules.

The PLL for each company-level UIC was loaded into inner modules specifically identified for that UIC. The

☐ Inner storage modules configured with various size drawers.

☐ Inner storage modules configured with drawers and a "cage" for bulk storage.

☐ Inner storage module configured with sliding shelves for storage of large, heavy materiel.

module stuffing process was completed before the arrival of the containers. During the process of loading modules into the containers, a single 20-foot container was used to store and transport the PLLs for multiple UICs, with the modules consolidated within a container by battalion as much as possible.

The durable FPU inner storage modules weigh approximately 2,000 pounds when fully loaded. The modules are designed to be locked in place inside of the FPU container for storage and transport. They can be easily removed from the container with a forklift after arrival in the area of operations. The modules can be handed off to individual units and placed on the back of a 2.5-ton family of medium tactical vehicles (FMTV) truck or a similar vehicle capable of carrying a 2,000-pound payload. When transported outside of the FPU container, the modules can be secured for transport by running chains or straps through the module forklift pockets and, if needed, a strap over the top of the module.

The ASL and PLL materiel that was pre-positioned for this effort was sent to DDSP from various CONUS locations for consolidation and containerization. The materiel arrived by several different modes of transportation and conveyance, including the U.S. mail, the United Parcel Service, and as standard freight carried by several different trucking companies. During the module stuffing process, it was noted that, in some cases, the packaging (usually cardboard cartons) was considerably larger than the item it carried. This packaging took up additional space in the module, limited access to materiel, and precluded the best use of container and module storage space. Such bulky packaging could result in the need for additional modules and containers. The MS&T containers and modules, with their individualized storage compartments, provide a significant improvement in materiel handling and protection compared to the "bulk" type storage containers, such as military van (MILVAN) containers, that commonly are being used today.

Problems

The module configuration effort included the process of sizing the module drawers and compartments to best fit the repair parts. Once a drawer configuration was designed, the total number of each size drawer in a specific module configuration was fixed.

Accurate data on the dimensions of the materiel being containerized are needed for planning and determining the right size and number of drawers and the compartment sizes for the required module configuration. Lack of dimensional data complicates the module stuffing process. Without accurate dimensional data, it is much more difficult to plan and prepare a module load plan that indicates which part is stored in which module and compartment.

The lack of a comprehensive load plan caused the CCP to physically size the materiel by UIC and select one of the eight available module configurations to load

it. The CCP then initiated the arduous process of placing materiel into compartments that best fit the size of the parts. The module loading process can be streamlined significantly by using a comprehensive load-planning tool.

Another apparent problem involved the packaging of the materiel being containerized. The packaging policy requirements for Department of Defense pre-positioned materiel are contained in Army Regulation 700–15, Packaging of Materiel. Army implementation guidance is contained in Technical Manual 38–470, Storage and Maintenance of APS Materiel. These policies dictate that items will be packaged with a military level of preservation and a level A or B pack. [A level A pack, in tandem with applied preservation, must be capable of protecting materiel from the effects of direct exposure to extremes of climate, terrain, and operational and transportation environments. A level B pack, in tandem with applied preservation, must be capable of protecting materiel not directly exposed to extremes of climate, terrain, and operational and transportation environments.] The current packaging policy applies to all materiel regardless of the type of container used or the level of protection afforded. Materiel carried in MS&T containers that is strategically placed in durable, specifically sized compartments may be "overprotected." There may be a need for separate and distinct packaging requirements that recognize the difference in protection required for materiel carried in bulk storage containers and materiel carried in the MS&T containers.

Suggestions for Improvements

The experience of the Army-DLA containerization effort suggests some improvements that should be made in using MS&T containers. The inner modules should be redesigned to accommodate a variable number of different-sized drawers so that modules can be reconfigured and drawers interchanged as needed during the module loading process. [The FPU modules have been redesigned to meet this requirement. Future module production will include this change.]

A complete and accurate dimensional database for repair parts should be developed and maintained to provide the level of detail needed to support planning efforts. Historical data (such as what size compartment was used for a specific NSN) can be used initially to develop this database.

Once the dimensional data are available, a process (such as a macro or load-planning tool) should be developed that uses the dimensional data and quantities of materiel, calculates the total number of each size of drawer and compartment required, and recommends a configuration that places the materiel into specific locations to optimize the load. The long-term solution to this problem is the effective integration and synchronization of the configured load-building tool requirement into a common architecture or system, such as the Global Combat Support System-Army (GCSS-Army).

The packaging community should review current packaging policy and the protection afforded by the MS&T containers and determine if unique packaging guidelines are needed for materiel packaged in these containers.

MS&T containers offer significantly increased versatility and functionality over one-dimensional and fixed-configuration containers. Using these containers enhances mobility, supports efforts to reduce the logistics footprint in a theater, and provides ready access to materiel whether units are in garrison or in the field. They improve logistics support to the soldier by increasing throughput, minimizing handling, and physically speeding the flow of supplies to the troops in the field.

Strategically placing all of the individual parts into the individual compartments of the MS&T containers requires additional time and work at the CCP, but it should significantly reduce the handoff time to the troops in the field and greatly increase the visibility and usability of the materiel being transported.

The initial module configuration and the loading process can be streamlined by using a comprehensive load-planning tool that considers the dimensions of the materiel being loaded in order to properly size the compartments in the modules. Packaging requirements for materiel stored and transported in MS&T containers may need to be revised to reflect the added protection provided by the MS&T containers and to optimize the use of container space.

The joint Army-DLA effort to configure and ship class IX containerized loads for the APS program using MS&T containers was a success. Future efforts are being planned. **ALOG**

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David Cheek and David Branson were students at the University of Tennessee and serving as summer interns at the Army Logistics Integration Agency when this article was written.

'Logistocrat' or Professional Logistician?

by Colonel Christopher R. Paparone

I am becoming increasingly alarmed by the emergence of the Army "logistocrat," who is characterized by a growing esoteric use of technical jargon, a propensity to use contracted support, and a mechanical image of organization. My fear is that the Army logistics community is becoming a technician-controlled bureaucracy instead of a profession. The potential erosion of the profession of military logistics is clear and present, and we must do something to reverse this phenomenon.

In his seminal 1957 book, *The Soldier and the State*, Samuel Huntington describes three characteristics of a profession: expertise (specialized knowledge and skill), responsibility (performing directly in a social context), and "corporateness" (a sense of organic unity and consciousness, apart from laymen). With these characteristics in mind, let us examine the state of our profession.

First, I have noticed that Army logisticians increasingly use nebulous terms and concepts to communicate. Is "a smaller logistics footprint" simply a more modern metaphor than Henry Eccles's antithetical concept of the "logistics snowball" published in 1959 in *Logistics in the National Defense*? "Focused logistics" has apparently replaced the principle of logistics defined as "economy" by James Huston in his 1967 book, *The Sinews of War*. Huston presents 13 more principles that we might miss if we continue to replace his valuable contributions with jargon that lacks real meaning.

Technical colloquialisms are beginning to snuff out our body of professional knowledge that took 200 years to acquire. Bureaucracies characteristically invent new and expedient language rather than build on a professional body of knowledge. The use of the term "strategic logistics" somehow makes high-level logistics organizations seem more important. "Strategy" denotes the effect of logistics activity and is not associated with a particular command level, unit size, equipment type, or force or component type. Eccles coined the more useful term "national logistics" as both a precursor to and the result of national strategy (i.e., he asserts that there is a nonlinear and interdependent relationship between national logistics and strategy—logistics drives strategy and strategy drives logistics).

Second, I believe we are becoming removed from the responsibility for doing logistics and are becoming enthralled with "managing contracts" instead. As we downsize and centralize logistics from the forward support battalion to the Army Materiel Command, we replace more and more of our military force structure with civilian contractors. Not only do we risk mission failure by being unable or unwilling to place civilians in harm's way when the need arises, but we also risk losing a generation of trained uniformed logisticians. A look at the personnel employed by contractors under the Logistics Civil Augmentation Program, for example, would find many prior-service and retired military logisticians. The danger, without responsible vision, is that a "death spiral" will occur until there is no human resource pool from which the contractors can draw.

I remember deploying to Bosnia at significantly reduced battalion strength, but not to worry, because contracted support would be available. Indeed, civilians handled much of our organizational maintenance and retail supply activity. Unfortunately, we did not operate from a doctrinal brigade support area in Bosnia. The few logistics soldiers in the division did not learn doctrinal battlefield logistics processes. In fact, they learned (incorrectly) that contractors could do almost all of it.

Finally, I believe that "organic unity" is being replaced by a mechanistic image of organization and performance. Because of our obsession with performance metrics such as the "Balanced Scorecard," which the Army recently adopted for use in its "Strategic Readiness System," we have begun to seek "hard" control and accountability measures to replace softer professional feelings of trust, "followership," and leadership. (The Balanced Scorecard is a business management approach popularized by writers Robert S. Kaplan and David P. Norton.) Our organizational "logistocratic" culture has adopted Harvard Business School-like "substantive" outcomes, such as goal achievement, mission performance measures, and allocations of resources, as the important focus for organizational effectiveness. But these are really traditional (and mechanistic) management concerns of those in positions of authority.

On the other hand, leaders in a professional culture must view organizational effectiveness in terms of influencing symbolic outcomes (sentiments, beliefs, attitudes, satisfaction, values, and commitment). While both substantive and symbolic outcomes are important, professionals value symbolic outcomes more because they understand that symbolic outcomes are the basis for substantive outcomes. By definition, a profession is self-managing rather than hierarchically controlled.

The situation is not hopeless. The true logistics professionals in the Army have a moral obligation to reverse these trends. It is their duty to bring up a new generation of professional military logisticians. The remaining professionals must challenge the emergence of technical jargon over adding to a body of knowledge; beware of over-reliance on contracted support that subverts organic ability; and prevent the loss of a professional culture that values autonomous work as a corporate body. It is vital that we reestablish the profession and disestablish the logistocracy—they are incompatible.

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The Value of Civilians

by Brigadier General James H. Pillsbury

The former commander of the Defense Distribution Center learned that, while the Government's civilian workers operate in a different culture than the military, they are professionals who bring knowledge and dedication to our Nation's defense mission.

I had the distinct pleasure of commanding civilians for 2 years at the Defense Distribution Center (DDC) in New Cumberland, Pennsylvania. DDC has 8,300 dedicated individuals stationed at its headquarters and at 22 distribution centers worldwide, from Yokosuka, Japan, to Germershiem, Germany.

DDC's mission is to receive, store, and issue all classes of supply (except class V [ammunition]) with tailored logistics services for the Defense Logistics Agency. As a result, DDC stores about 4 million different types of items valued at over $82 billion. The organization processes about 23 million lines (receipts or issues) annually for customers, with an annual budget for second-destination transportation costs of approximately $400 million a year. DDC is a large, dynamic operation, and its workforce is 99 percent civilian.

I grew up in the tactical Army, with over 16 years of divisional time. Leading and commanding soldiers had become my first love and somewhat second nature. I did not have an appreciation of the Department of Defense (DOD) civilians who worked on the posts where I was stationed. I did not appreciate them because I did not understand the critical role they play or their unyielding dedication to the mission.

Positive Impressions

This misperception started to change on 3 August 2000, when I assumed command of the civilian-based DDC. Several lasting impressions were made on me in the first few weeks of my command. I learned that the civilians had tremendous technical knowledge and were a dedicated, flexible workforce. Especially important, I realized that the civilian culture was different from the military's, yet similar in so many ways.

From the very first orientation on my arrival to the last brief before I relinquished command, I was the recipient of the staff's great depth of knowledge of the distribution mission; that included leading-edge knowledge of the science of distribution, not just DDC's corporate history and associated lessons learned. Not only were these civilians knowledgeable, but they also were generous in sharing their time and knowledge. A real strength of our civilians is that they are stable, remaining in their jobs for much longer periods of time than the military. They thus learn their jobs and are able to hone the skills necessary to be at the highest level of skill and knowledge in their fields.

My second impression was of the great dedication of civilians to supporting the warfighter. This was evident during "peace" (before 11 September 2001) and most certainly was evident after 11 September. These great Americans truly want to make a difference in the lives of military personnel.

My third impression was gained as the workforce amazed me with its flexibility and drive. DDC has been undergoing A–76 competitions for the last 3 years. These competitions put the Federal workforce in direct competition with private industry for conducting the distribution mission at the continental United States distribution cen-

ters. To date, three distribution centers have retained the mission in-house with Federal workers, while six competitions resulted in the work being awarded to contractors. Despite the tremendous upheaval in the work environment caused by these competitions, the workforce has continued to provide world-class distribution support to our customers.

The Civilian Culture

My final impression, but an equally important one, was of the organizational culture. This element of the equation was the hardest for me to "get." The civilian culture is not vastly different from the military, yet it is distinctly its own! The pace of work is different—sometimes slower than the military, sometimes faster, but always more constant. While the military operational tempo (OPTEMPO) in peacetime centers around training cycles, civilian OPTEMPO remains constant. The personnel tempo in civilian positions is much more stable than in the military.

The greatest similarity between the two cultures is the desire to be the best possible organization. I was struck by this fact time and again during my 2 years of command.

Certainly there are many differences between the civilian workforce and a military unit—no formations, no first sergeant, no haircut standards, and the like. These obvious differences are easy to see, understand, and manage. The subtle differences make for interesting discovery learning. The merit promotion system for civilians is different from that of the military system, much slower, more cumbersome, and not at all automatic.

Discipline within the cultures is quite different. The Uniform Code of Military Justice within the military is quite easy to understand and use as it governs workplace infractions. The civilian culture is much more complicated. Attorneys and union officials play a huge part in the process, and judgment is not swift.

Professional schooling within the military is one of its strengths. Schooling within the civilian workforce is somewhat more informal and depends on superiors and organizations to send the employee to school. Consequently, the level of professional education available to the military is somewhat more standardized across the ranks than in the civilian workforce. This fact is quickly evident when dealing with higher level General Schedule employees. Those who have attended a senior service college (such as the Industrial College of the Armed Forces or the Army War College) have a vast advantage over those who have not yet attended such colleges.

Stability and Change

A key strength of the civilian workforce is its stability. This stability allows senior civilian leaders to plan, implement, observe, and, when necessary, change long-range plans and policies. While stability is a strength, it is also a drawback when it comes to change and change management.

Change within the military is a constant fact of life. Permanent change of station is the norm for active-duty forces. Job changes within a 3-year tour are expected. Job and responsibility changes come with promotion. Units change their equipment and mission profiles. These and other situations make military personnel more adaptable to change than their civilian counterparts.

DDC is the exception to this general truth. A relatively young organization, DDC stood up in October 1997 following the disestablishment of two regional headquarters, and it has seen a vast reduction in its workforce and workload. DDC has worked through the closure of 10 sites and 1 major realignment caused by the Base Realignment and Closure process and 9 implementations of A–76 study results. The DDC civilian workforce knows change and handles it exceptionally well, so I felt relatively comfortable dealing with the organization when change was involved.

Many times military members look on our civilian workforce as "bureaucrats," with all the negative connotations associated with that term. Nothing could be further from the truth. I recently heard a comparison of the terms "professional" and "bureaucrats." A "professional" is someone who takes knowledge and applies it to a new construct or situation. A "bureaucrat" is someone who applies knowledge to the same function day in and day out. I am amazed at the depth and breadth of the civilians' knowledge and how they are not hesitant to try new things. DOD's civilian employees are professionals.

Given the similarities and differences between the military and civilian cultures, "commanding" civilians is a challenge, but no more so than commanding a large military unit. My experience with the civilians of DDC clearly demonstrates that civilians do great work! Military and civilian personnel alike are best served, and serve this Nation best, when they are provided with the resources and direction that enable and empower them to work toward accomplishing their organization's mission and attaining its vision.

Young leaders in today's military need to look at our great civilian workforce with pride and know they are there to support. Also, if those leaders are lucky, they could have the chance to "command" them one day.

Brigadier General James H. Pillsbury is the Deputy Chief of Staff, G–4, of U.S. Army Europe and Seventh Army. He was the commander of the Defense Distribution Center when he wrote this article.

Logistics Support of Operation Iraqi Freedom

☐ **A soldier at Champion Main, Kuwait, performs preventive maintenance checks and services on a 105-millimeter howitzer.**

On 20 March, a multinational coalition began operations to liberate the Iraqi people, eliminate Iraq's weapons of mass destruction, and end the regime of Saddam Hussein.

Some 2 weeks later, Lieutenant General John P. Abizaid, Deputy Commander (Forward) of the Combined Forces Command/U.S. Central Command, observed, "I'm certain that when the history of this campaign is written, people will look at this move that the land forces have made in this amount of time as being not only a great military accomplishment, but an incredible logistics accomplishment."

The photos on these pages provide a look at some of the logistics support the Army provided to the coalition's warfighters in the first weeks of the operation. **ALOG**

☐ **A soldier fills water bags on a donkey for Iraqi children at a water distribution point in Central Iraq.**

☐ A Marine Corps light armored vehicle provides security for an Army convoy transporting supplies to the fighting forces.

☐ Boxes of meals, ready to eat, destined for soldiers participating in Operation Iraqi Freedom are carried into a supply tent in Kuwait.

☐ Soldiers at Ali Al Saleem, Kuwait, rig bundles of humanitarian daily rations for airdrop into Iraq.

1st COSCOM Gets Equipment and Supplies to the Soldiers

The 1st Corps Support Command (COSCOM) at Fort Bragg, North Carolina, plays a vital role in supporting the war on terrorism. It is responsible for moving the supplies and personnel of the four divisions of the 18th Airborne Corps: the 82d Airborne Division at Fort Bragg; the 101st Airborne Division (Air Assault) at Fort Campbell, Kentucky; the 10th Mountain Division (Light Infantry) at Fort Drum, New York; and the 3d Infantry Division (Mechanized) at Fort Stewart, Georgia. The 1st COSCOM also meets the needs of the thousands of troops who support these units worldwide.

To accomplish this mission, 1st COSCOM units such as the 403d Transportation Company and the 58th Maintenance Company have worked 24 hours a day to prepare units for deployment. "We don't shut down if it's raining or snowing or it gets too cold. We just keep going through the elements to get the mission done," said Staff Sergeant Timothy Carmoney, noncommissioned officer in charge of the Corps Logistics Area Control Center (CLACC), 58th Maintenance Company.

The CLACC is the first step in moving equipment and cargo from Army posts to the combat zone. CLACC operations are critical to the combat effectiveness of vehicles that deploy from Fort Bragg. Every unit that deploys must go through the CLACC, and the 58th Maintenance Company's team of professionals is ready to assist any unit at any time.

The second step in getting equipment to the combat zone is actually moving it out of Fort Bragg. Equipment leaves Fort Bragg by three different methods: air, rail, and truck.

1st COSCOM's 507th Arrival/Departure Airfield Control Group sends equipment by air from Pope Air Force Base, North Carolina. Equipment can be transported quickly anywhere in the world on military air transports such as the C–5 Galaxy and the C–17 Globemaster. Although air transport allows equipment to move quickly, this option is expensive.

Equipment is shipped by rail from the Fort Bragg rail yard to training sites, ports, and other airfields across the continental United States. This process is cheaper than air transport, but more time consuming.

□ 1st Corps Support Command soldiers load a light medium tactical vehicle onto a railcar at the Fort Bragg, North Carolina, rail yard for shipment to the Port of Charleston, South Carolina, where it will be shipped by sea to support Operation Iraqi Freedom.

☐ Containers of military equipment await transport on a leased dock at the Port of Charleston, South Carolina.

☐ Kalmar rough-terrain cargo handler drivers stay close to their vehicles as they wait for the vehicles to be loaded on the *USNS Capella* for shipment to the Persian Gulf.

☐ At right, military and port personnel discuss loading issues at the Port of Charleston before loading the *USNS Capella* with supplies and equipment bound for Operation Iraqi Freedom. Below, a dockside crane lifts a heavy equipment trailer onto the *USNS Capella*.

Equipment sent by truck moves quickly to ports and airfields anywhere in the country. If the amount of cargo is greater than the hauling capacity of available military trucks, civilian trucks are contracted to complete the mission. Transport by truck can be expensive and is used only within the continental United States.

All equipment not transported across the Atlantic by military aircraft is sent to ports along the eastern seaboard of the United States. From there, 1st COSCOM soldiers and activated Army National Guard and Army Reserve units work together to load the equipment onto Navy and contracted ships. Like the Merchant Marine of World War II, civilian contracted shipping companies provide equipment and personnel to assist the military with shipping cargo. The cargo capacity of one fast sealift ship is 190 times greater than that of a C–17 Globemaster; a Navy fast sealift ship can carry over 1,200 pieces of equipment. It costs less to transport equipment by sea than to ship it by air, but it takes longer; a trip by sea to the Indian Ocean can take up to 30 days.

Once the supplies have left the United States by air or sea, the 1st COSCOM is responsible for tracking and

☐ Shrink-wrapped OH–58 Kiowa Warrior helicopters wait to be transported aboard the *USNS Capella*. Shrink-wrap protects sensitive equipment from the elements during transport.

☐ Radio frequency transmitters are attached to cargo containers to help logisticians account for containers anywhere in the world.

☐ Tactical vehicles belonging to the 82d Airborne Division await overseas shipment in support of Operation Iraqi Freedom.

☐ The *USNS Gordon* prepares to leave the Port of Charleston, South Carolina, en route to the Persian Gulf.

distributing them. Advances in technology have improved the visibility and accountability of the flow of logistics. New technologies and equipment, ranging from new radio frequency transmitters to Kalmar rough-terrain cargo handlers, have made it easier for logisticians to do their jobs. "Radio frequency [RF] transmitters attached to cargo containers is one way we can track equipment as it moves. As containers come and go from different ports and airfields all over the world, the RF transmitters allow us to monitor and keep accountability of everything inside," said Brigadier General Brian I. Geehan, Commander of the 1st COSCOM.

"Even with all the advances in technology, soldiers still have to do most of the legwork—from guiding equipment onto railcars and loading C–17 Globemasters to strapping down equipment on the back of flatbed trucks and loading seagoing vessels," said Geehan. "And 1st COSCOM soldiers do that legwork 24 hours a day."

The Army Logistician *staff thanks Specialist Travis Edwards, noncommissioned officer in charge of the 1st Corps Support Command Public Affairs Office at Fort Bragg, North Carolina, for providing the information and photos contained in this article.*

CEB-Livorno Prepares Brigade Headed for Operation Iraqi Freedom

Prepare the 173d Airborne Brigade for contingency operations? *Non c'e' problema!* Not a problem! Go to a 24/7 operation with 1 day's notice? *Si, puo fare!* Yes, can do! Inspect and repair more than 500 vehicles in only a few days? *Certo! Nient'altro?* Sure! Anything else?

These are just a few examples of how the Army Materiel Command's (AMC's) Combat Equipment Battalion (CEB)-Livorno, Italy, worked at full speed in February and March to help prepare equipment and materiel belonging to the 173d Airborne Brigade at Vicenza, Italy, for contingency operations. On 26 March, in the largest airborne operation since World War II, several hundred "Sky Soldiers" of the 173d Airborne Brigade parachuted into northern Iraq to secure an airfield and help open a northern front in Operation Iraqi Freedom.

"This was an extraordinary mission for us, but one we were well equipped to handle," said Lieutenant Colonel Sandy W. Pogue, CEB-Livorno's commander. Pogue said the brigade matched AMC's logistics capabilities with urgent warfighter requirements, making it possible to project combat power from southern Europe.

A CEB-Livorno mechanic and a 173d Airborne Brigade soldier make sure an M923 truck is ready for combat.

CEB-Livorno's 260 skilled Italian civilian workers, led by 24 U.S. soldiers and civilians, were key to the successful operation. "Within hours of getting a call from our headquarters, we went to 24/7 operations," said Alberto Chidini, the battalion operations officer. "Working together with soldiers is very motivating. We all knew that these soldiers and their equipment may have been headed into battle, so we wanted to make sure everything was combat-ready."

It was no surprise that the 173d chose CEB-Livorno for this mission; the battalion offers every element of power-projection capability. "We are an ideal staging base," Pogue noted. "With air, sea, rail, and road transportation at hand, we can move people and equipment rapidly and efficiently . . . In a transforming Army, we are ideally placed and prepared to rapidly project combat power."

CEB-Livorno's supply personnel helped unload approximately 540 vehicles from railcars and hustle them to repair shops. According to Curtis Dabney, CEB-Livorno maintenance director, the battalion worked day and night "turning wrenches, making sure that if these vehicles had to take soldiers into combat, they'd be good to go."

In the ammunition storage area, Chief Warrant Officer (W–2) Tory Kessinger was at the center of a whirlwind of activity. "As the mission evolved, we had to adjust and reconfigure the ammo," said Kessinger, CEB-Livorno's ammunition operations officer. "It's a testament to our workers that whatever it takes, they do it—safely."

The numbers are staggering: 13,000 man-hours worked in less than a month; more than 540 vehicles inspected and repaired; dozens of storage containers repaired and loaded; tons of ammunition configured safely for shipment.

Pogue said that, at CEB-Livorno, power projection is more than just a concept. "Day in and day out, we work to provide combat-ready equipment and materiel, enabling the Army to get to the fight faster. A plaque on my wall says we are the 'Force Behind the Force.' The proof of that claim is visible all over CEB-Livorno: AMC soldiers and civilians, working side by side with USAREUR [U.S. Army Europe] warfighters." **ALOG**

The Army Logistician *staff thanks Charles Fick of the Combat Equipment Battalion-Livorno, Italy, for providing information and photos for this artcle.*

Virtual Training for CSS Soldiers

by Pete Thibodeau

Using simulated forces during training exercises not only saves millions of dollars annually but also averts the sociological, economic, and ecological damage inherent in live exercises.

The Army Combined Arms Support Command's (CASCOM's) Training Directorate, the National Simulation Center's (NSC's) Logistics Exercise and Simulation Directorate, and the Army Training and Doctrine Command (TRADOC) Analysis Center Fort Lee (TRAC-Lee), all at Fort Lee, Virginia, have teamed up to study the use of interactive and immersive technologies to train combat service support (CSS) soldiers.

To explore the possibility of building and operating a virtual training environment at Fort Lee, the CASCOM/NSC/TRAC-Lee team visited the Virginia Polytechnic Institute and State University's Department of Computer Sciences' Center for Virtual Environments and Visualization at Blacksburg, Virginia. One of the highlights of the visit was a demonstration of the Virginia Tech Computer Automatic Virtual Environment (VT–CAVE) and several virtual environment applications.

The VT–CAVE is a three-sided facility that provides a virtual or synthetic environment for displaying three-dimensional (3D) images, including peripheral images. Users wear sensor devices and special glasses that allow them to be "immersed" in a 3D, real-time, synthetic environment that is produced by one or more computers. Input to the system can be accomplished with body movement tracking, verbal commands, or the use of "wands" or "data gloves." Instantly, the participant's senses (mainly vision and hearing, and occasionally touch) are stimulated, causing him to feel as if he is actually immersed in an interactive synthetic environment.

Virtual Versus Live

Training in a virtual environment is effective, realistic, and efficient and offers considerable advantages over live training. Among them are greatly reduced training costs; more control over simulated training situations; and greater soldier safety, which is achieved by correcting mistakes in a virtual environment that, in real life, could result in disaster. Soldiers can gain valuable firsthand experience in a virtual environment without being placed in harm's way. It is because of these advantages that the Army will vigorously pursue training in virtual environments.

The advantages of simulation can be seen by comparing the Return of Forces to Germany (REFORGER) exercises of the 1980s with those of the 1990s. These exercises were the principal training events for battalion, brigade, and corps commanders and staffs. In the 1980s, a REFORGER exercise was a massive effort that required deploying an all-live force of thousands of soldiers and vehicles. Accidents, damage to personal property, and social and environmental disturbances were the norm. The exercise cost hundreds of millions of dollars annually—a fact that led officials to look for a better way to train CSS soldiers.

In the REFORGER exercises conducted in the 1990s, most lower level forces were replaced by simulated units through the use of the Corps Battle Simulation. The switch to simulated forces instead of live forces not only saved millions of dollars annually, but also ended the sociological, economic, and ecological damage wreaked on the German countryside every year.

CSS Simulations Center

To ensure that the CSS community remains on the leading edge of technological advances for training soldiers, the CASCOM/NSC/TRAC-Lee team has proposed

Tom Edwards, Deputy to the Commanding General of CASCOM, wears a head-mounted display and uses a virtual pallet and wand to interact in a virtual 3D environment.

the construction of a CSS Simulations Center at Fort Lee. If approved, the facility will provide the CSS training community with a state-of-the-art virtual environment and simulation capability.

In such an environment, senior officers can immerse themselves in a virtual "rock drill" that will permit them to plan and execute operations and immediately see the results of their efforts in a CAVE environment. A virtual environment also will allow them to play out exercises used in the Joint Deployment Logistics Model or in leadership vignettes provided by the CASCOM Training Directorate's Multifunctional Training Division. More complex virtual environment situations may incorporate various ground or aerial terrain scenarios; ordnance, transportation, quartermaster, or medical assets; and battlespace or urban interactions.

A CSS Simulations Center will provide a virtual environment for CASCOM's Sustainment Portal (see article on page 32). This initiative will provide CSS soldiers with training on critical CSS tasks relating to—

- Mobilization; deployment; reception, staging, onward movement, and integration; and sustainment operations.
- Intransit visibility and distribution management.
- Management of the infrastructure and assets associated with strategic, operational, and tactical movements and maneuvers.
- Unit-through-depot maintenance operations.
- Medical operations from point of injury through definitive care.
- Medical supply operations.
- Personnel replacement operations and strength management.
- Materiel management and distribution operations, from the tactical level through the industrial base.
- Nuclear, biological, and chemical operations.
- Local, national, and international civilian/military operations.

Through the continued exploration and exploitation of virtual training environments, the CASCOM/NSC/TRAC-Lee team, with help from industry and academia, will strive to provide the CSS community with a one-stop shop for command and control systems modeling and simulation opportunities and communication links to a distributed, interactive, simulation, experimentation, and training environment. **ALOG**

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The Sustainment Portal—Virtual Technology for Transformation

by Chief Warrant Officer (W–5) Patrick E. Conway

To sustain the Objective Force in a high-tech, jointly integrated environment, the Army must do more than merely modernize equipment and information systems. The Army must rethink the fundamentals of how it prepares, deploys, and supports military operations. It needs to transform not only the products but also the actual processes it uses to develop, update, and deliver doctrine, training, and materiel to the field. The Army must establish processes and procedures that are as effective, adaptive, and responsive as the warfighting units they are designed to support.

☐ Standard computers emulate the functionality of actual battlefield operating systems.

Twenty-first century technology cannot be employed successfully using 20th century practices. The pace of transformation is too fast; the traditional "stovepipe" processes are too slow; the complexities of a multicomponent, joint force structure are too demanding; and the cost in terms of dollars and readiness is too high.

The Army Combined Arms Support Command's Sustainment Portal initiative addresses this challenge by using technology to integrate, improve, and transform the processes of combat, materiel, training, and simulation development. Using a virtual platform powered by a suite of local and remotely linked digital systems, the Sustainment Portal provides a collaborative environment for planning and assessing doctrinal concepts, conducting mission analyses, performing digital rehearsals, developing simulation-based training, and supporting schoolhouses and Army or joint units during exercises, deployments, and actual operations. In other words, it provides an integrated approach to supporting an integrated force.

Knowledge Management

The cornerstone of maneuver sustainment is effective knowledge management. Information must be accurate, timely, and responsive to the needs of the warfighter. The Army requires knowledge that can be acted on, reused, and shared across the doctrine, organizations, training, materiel, leadership and education, personnel, and facilities domains. Knowledge also must be updated frequently and reformatted as necessary to meet the requirements of the information systems, publications, and products delivered to the field.

The Sustainment Portal is answering this challenge. By using tools such as the Joint Computer-aided Acquisition and Logistics Support (JCALS) system to develop, format, and share Stryker vehicle technical data, the Sustainment Portal establishes a real-time, global interface

☐ The Sustainment Portal provides operators and maintenance personnel with rapid access to authoritative source data.

among the vehicle manufacturer, training developers, and Stryker brigade combat teams.

The Sustainment Portal improves combat readiness by providing operators and maintainers with rapid access to authoritative source data, the means to identify and report discrepancies quickly in electronic technical and training publications, and a logistics knowledge "reach-back" capability linked directly to vehicle engineers, materiel developers, and training proponents. The result is a fast and efficient way to update, train, and sustain commanders, soldiers, and their Stryker fleets that is a model for the development of the Future Combat Systems and other emerging platforms.

"Living" Training

Training transformation means moving toward an environment in which soldiers, units, and trainers can access effective training whenever and wherever needed. Getting there will require transforming both the training products and the processes by which those products are developed, updated, and delivered.

As part of the Army's digital training strategy, the Sustainment Portal is testing digital training support packages that link training publications, online interactive multimedia instruction, scenario-based simulations, and learning management systems using Army Knowledge Online and supporting information architectures. The goal is to achieve an efficient and cost-effective way to establish, integrate, and maintain "living" training products and globally distribute simulation-driven packages that can be adapted, modified, and reused by individual soldiers, unit

☐ The Sustainment Portal establishes a real-time, global interface among the manufacturer of the Stryker armored vehicle, training developers, and Stryker brigade combat teams.

commanders, and school commandants to satisfy their unique training needs.

Modeling and Simulation

In an effort to expedite delivery of digital training while reducing costs, the Sustainment Portal is being used to assess the Army's capability to develop "digital training simulators." These simulators allow standard computers to emulate actual battlefield operating systems. This initiative will significantly reduce the cost of implementing institutional digital training and allow soldiers to access digital training wherever they are without actually having specific hardware and software systems.

The Sustainment Portal also is being used to experiment with various modeling and simulation programs in an attempt to achieve a virtual digital rehearsal capability. Such a capability would allow collaboration among commanders, staffs, and school commandants to model, plan, and assess military operations—a virtual "sandbox" that could support exercises, training, and warfighters deployed on actual missions.

For more information on the Sustainment Portal, contact the Army Combined Arms Support Command Training Directorate at (804) 765–1653 or send an email to conwayp@lee.army.mil. **ALOG**

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Gun Trucks: Genuine Examples of American Ingenuity

by Paul S. Gardiner

American history is replete with innovations and practical solutions to problems that often have saved lives and led to a better quality of life. Most people hear only about the more significant inventions and discoveries that affect people in general or that have far-reaching benefits for years to come. Typical examples include penicillin, cures for various diseases, and technological advances such as the telephone, television, and personal computer.

In wartime, the axiom, "necessity is the mother of invention," has led to many innovations by the American military. Many of these are unknown or misunderstood by most Americans. Frequently, these innovations were in direct response to enemy actions or suspected actions that threatened the lives of American military personnel.

During the Vietnam War, an Army innovation—gun trucks—saved countless lives and enabled many American and allied forces to operate successfully in various regions of Vietnam. Gun trucks provided overwhelming firepower for protecting supply and ammunition convoys along routes that went through mountain passes and other areas threatened by deadly enemy ambushes.

Throughout the war, the Army was responsible for transporting most of the supplies and ammunition from coastal ports such as Qui Nhon and Cam Ranh Bay to inland locations such as Bong Son, An Khe, Pleiku, Da Lat, and Buon Me Thuot. Motor convoys operated by Army Transportation Corps units made most of those movements.

During the early years of the war, automatic rifles, grenade launchers, and machineguns mounted on jeeps were used to protect convoys. Over time, the enemy's firepower and ambush tactics improved, causing serious disruption of convoy movements, often with substantial loss of life, so the Army had to do something to protect the convoys better and defeat the enemy.

Development of the Gun Truck

Credit for development of the convoy gun truck usually is given to the Army's 8th Transportation Group headquartered at Qui Nhon, Vietnam. After an unusually devastating series of ambushes in September 1967, the 8th Transportation Group removed several 2-ton

☐ **Units used available materials to create gun trucks in Vietnam. Note the difference in the shapes of these two trucks.** *Photos courtesy of Mike Suckow ("Satisfaction") and Roger Williams ("Outlaw").*

☐ This replica of "The Untouchable" is available for display. The photo at left shows the bed of the truck.
Photos courtesy of William Parker.

cargo trucks from regular convoy service and outfitted them with sandbags on the floors and sides for protection. (Sandbags were eventually replaced with locally fabricated steel armor plate.) Two M60 machineguns were mounted in the cargo bay of each truck. The crew consisted of a driver, two gunners, and a noncommissioned officer in charge.

After a few months of operation, it became clear that the 2-ton truck lacked sufficient power to maneuver with the added weight of armor plate, weapons, and ammunition, so several of the more powerful 5-ton cargo trucks were converted into gun trucks. Some of the more important modifications included mounting .50-caliber machineguns in place of or in addition to M60 machineguns and adding a 7.62-millimeter "minicannon," which could fire thousands of rounds per minute. The men who operated the gun trucks usually painted nicknames such as "The Untouchable," "Satisfaction," "Outlaw," and "Pandemonium" on the sides of the vehicles.

Accurate records do not exist on the total number of gun trucks developed during the Vietnam War, but it is estimated that between 300 and 400 cargo trucks were modified to function in this manner. Gun trucks provided convoy security along Vietnam's highways from late 1967 until American forces departed the country in 1973.

Gun Trucks Today

With the end of the Vietnam War, the Army had little need for convoy gun trucks, which had not become part of the Army's regular inventory of wheeled vehicles. One truck, "Eve of Destruction," has been refurbished and is on permanent display at the Army Transportation Museum at Fort Eustis, Virginia. The rest of the original gun trucks were scrapped or were dismantled and returned to regular cargo duties.

One Vietnam veteran, who was a vehicle mechanic stationed at Qui Nhon in 1972, built an exact replica of The Untouchable (complete with model guns and mounts) to drive and display wherever people are interested. The original Untouchable had three radios for soldiers to communicate with air cover, camps, and artillery. It carried over 10,000 rounds of ammunition for two .50-caliber machineguns and two 7.62-millimeter minicannons. The replica of The Untouchable has been displayed mainly at military-related functions, such as Military Vehicle Preservation Association meetings and Vietnam veteran reunions, and at various military museums. Inquiries about a display of The Untouchable should be sent by email to redcatcher@prodigy.net.

The most comprehensive information on Vietnam-era gun trucks, with nearly 700 photographs, descriptions, crew lists, and ambush stories (including some anecdotes), can be found in *The Hard Ride: Vietnam Gun Trucks* by James Lyles, an ex-gun truck commander.

The Army's gun truck was one of the most important innovations that occurred during the Vietnam War. It is an outstanding example of what the military refers to as a "field-expedient measure" required to save lives and ensure mission accomplishment. The gun truck is an American legacy that will not be forgotten soon. **ALOG**

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Quality Control Versus Average Cost Per Unit

by Sergeant First Class James Adams, Jr., ILARNG

In an article in the September–October 2002 issue of *Army Logistician,* Major General Mitchell H. Stevenson laid out the case for a new two-level maintenance system. I think a key issue presented at the end of the article— "Increased productivity of maintainers, and therefore increased combat power"—warrants further discussion. I feel that, although increasing productivity of maintainers is important, increased productivity without equal or greater emphasis on the quality of the work produced will set a maintenance program up for failure.

The question is: Who will continue to monitor the performance of maintainers? As the Department of Defense and the Army adopt civilian business practices and centralize stocking and procurement practices, will they continue to adhere to the highest standards or will they adopt minimum standards that may affect Army readiness?

Quality control is important throughout the Army. However, acceptance of minimum standards is of greatest concern to the maintenance community because even a highly skilled soldier is apt to fail if his equipment fails. In the civilian world, achieving the right average cost per unit is critical for a business to survive. But because of the nature of its business, the Army's needs are different. True, budgets are tight and we must do more with less, but the quality of our products and our work must be above reproach. Soldiers' lives are at stake.

Rebuild Program Importance

The area that I want to discuss is product reliability of rebuild programs. Unfortunately for those engaged in the programs and for the end user, rebuild programs are dollar driven. The Army has shifted its focus from providing the best product to reducing the average cost per unit, causing product reliability to suffer.

Rebuild programs are most important in the Army National Guard and Army Reserve because the Army cannot send new equipment to Guard and Reserve units until its active-duty operational needs are met. Although most Guard and Reserve rolling stock has an average age of about 18 years, some of the equipment is from the Korean War or Vietnam War, which makes rebuild programs essential. The units that receive this equipment must maintain it until replacements arrive. I have seen the results of some good rebuild programs and, unfortunately, some bad ones.

Rebuild Program Comparison

The 519th Maintenance Company in Kuwait ran one of the finest rebuild programs I have seen. The chief warrant officers and I insisted that the equipment that left our shop perform at the highest standards. When a civilian contractor took over the operation, the equipment met the standards for the contract but did not meet the higher standards that we had enforced. In Kaiserslautern, Germany, a former Marine chief warrant officer also ran a very good program. He insisted that most of the used parts be tested and reused but that they still meet all the standards. Can you spot any differences?

Two of the units supported by the Illinois Army National Guard organizational maintenance shop I work in recently received equipment from rebuild programs. Military units run both of these programs. Our service and support company picked up four fuel tankers from the fuel tanker rebuild program. These tankers have performed well and, with the replacement of a few minor repair parts (around $70 and 5 man-hours), are expected to continue to do so.

On the other hand, the 13 M817 dump trucks that our engineer company received from another rebuild program have not performed as expected. Our combined support maintenance shop received job orders for five of the trucks. One needed a new flywheel and clutch assembly because the wrong bolts had been used to mount the flywheel to the crank shaft, two had transmission synchronizer problems, one needed a new transfer case, and one needed a head gasket replaced. At the organizational level, two needed new alternators and several needed instrument panel gauges. Two did not have the power takeoff linkages properly adjusted, which resulted in the power takeoff shafts rotating at higher than normal speeds; the seals are now shot and the pumps will have to be repaired. If these trucks had been high-use items, or had a lot of hours of operation on them, these problems would be expected. But that is not the case. The average use of the 13 trucks was 10 hours and only 50 to 100 miles. The flywheel problem developed as the truck was being unloaded from the transporter.

Program Evaluation

Why did the quality of the products of the two programs differ? Both were set up with the same goal—rework equipment to pass 10–30-level inspections. To determine the reasons for the difference in the quality of the end items received by the gaining units, these questions might be asked—

• ***Average cost per unit.*** What was the average cost per unit? Were the standards used objective or subjective? Did the rebuild facilities build the best quality product or strive only to meet velocity management and cost containment issues? Did the fuel tanker rebuild facility request a higher average cost per unit?

• ***Facilities and equipment****:* Did both sites have the materiel resources needed to complete the job?

• ***Experience.*** Did the program manager of the site have personnel who were qualified to perform each task, or were personnel hired, regardless of experience, to meet cost or man-hour requirements or to keep the average cost at an acceptable level?

• ***Quality control.*** Were the quality control personnel aware of the acceptance criteria? Did they enforce the standards? Did decisions based on cost per unit overrule the judgment of the quality control element?

• ***Communication.*** Was the rebuild program run by a different branch of service than the receiving unit, resulting in different standards? Did the contracting officer or his representative have different contract or technical manual standards to enforce? Did the gaining unit understand the goals and requirements of the rebuild program? Was "rebuild" the proper term for each program, or would "recondition" have been more appropriate for one of them?

• ***Ethics***. Did the program managers accept and enforce the standards? Did the contracting officers and contracting officers' representatives ensure that the standards were enforced?

It appears that quality control was more intensive for the fuel tanker rebuild program than for the dump truck program. In addition, there was a lot of pre-acceptance cooperation and communication between the tanker rebuild program manager and the equipment supervisor in the Surface Maintenance Office for the Directorate of Logistics. The equipment supervisor made personal contact with the program manager of the fuel tankers and arranged for an inspection team to accept the equipment. The inspection team arrived, received a briefing on the program and site, inspected the equipment, found some discrepancies that were repaired on the spot, and accepted the equipment.

Although the cost of sending technicians to inspect the product may appear to be high, I believe it would have been more cost effective to use the same procedures for the dump trucks. It was apparent from the onsite inspection visit that the tanker rebuild program was a good program. The tankers were disassembled down to their frames, and each component was tested and rebuilt, if necessary. Either the mechanics were experts on the equipment, or more experienced personnel were readily available.

To the best of my knowledge, the only communication from the dump truck rebuild shop was the arrival date of the equipment and the mode of transportation. The only coordination was to ensure that the person who would sign for the equipment would be on hand to receive it. After several deficiencies were reported to the program manager, we were told that the trucks were not "rebuilt" in the manner the fuel tankers had been. They were road-tested and inspected for class-three (serious) leaks. Their rubber and canvas items were replaced, and then they were repainted.

Clearly, there was a difference between the process used and what one expects when an item has been "rebuilt." But regardless of how it happened, one thing is certain: One program used quality control to the greatest extent possible.

Just as soldiers training for combat cannot be satisfied with meeting minimum standards but must strive to be the best at what they do in order to improve their chances of survival in combat, maintenance organizations must ensure their products are the highest possible quality to increase the possiblility of survival of the user—the soldier.

If Army leaders intend to adopt civilian resource management styles and techniques, they must realize that they come at a price. Cost containment has a place in the Army system, but not to the degree that it does in the civilian world. Cost considerations must be combined with high standards, but the standards must be given priority over reducing cost. Then, whether the work is accomplished in house or by contractors, it will meet the standards needed for the mission. Perhaps the folks running rebuild procurement programs will have to reevaluate their cost control measures. Around the middle of the 20th century, a wise man said something that made civilians think hard about business practices but that the military has practiced forever: "You get what you inspect, not what you expect!"

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Asymmetric Sustainment: The Army's Future

by Colonel Larry D. Harman

> . . . it sometimes appears that the logistic aspect of war is nothing but an endless series of difficulties succeeding each other. Problems constantly appear, grow, merge, are handed forward and backward, are solved and dissolved only to reappear in a different guise. In face of this kaleidoscopic array of obstacles . . . one sometimes wonders how armies managed to move at all, how campaigns were waged, and victories occasionally won.
>
> —Martin Van Creveld
> *Supplying War*

Even as the world embraces the Information Age, today's commanders face logistics challenges strikingly similar to those encountered centuries ago. Essentially, supplying war has been, and remains to this day, a "big bet." Looking to the future, how will the U.S. Army continue to stack the logistics deck of cards in its favor?

Combining Different Rules and Tools

My intent is to suggest a distinctly different approach to future sustainment. This approach is "asymmetric sustainment."

Asymmetric sustainment recognizes the fundamental reality that an intelligent and determined enemy, if possible, will attack any U.S. weaknesses, whether strategic, operational, or tactical in nature. Asymmetric sustainment derives its credibility from recent assessments and projections of the future operational environment, threat capabilities, technological breakthroughs, and U.S. missions.

Asymmetric sustainment's expected value is gained by *combining* new laws and policies, innovative joint and Army Objective Force concepts, different mindsets and behaviors, emerging revolutionary technologies, and adaptive organizational designs. Most assuredly, this sustainment approach is focused on preventing the enemy from interfering with U.S. sustainment activities. This obviously requires different rules and tools. One indicator of asymmetric sustainment's success is that the enemy will hate it; another is that it will work in spite of the "fog of war."

Defining Asymmetric Sustainment

Without question, the United States is the world's leading exporter of armed security, and, when called on to fight, the United States does so unfairly. The U.S. military undoubtedly is the world's number one asymmetric fighting force. If this comes as a surprise to the reader, rest assured that our adversaries and potential adversaries already know this.

Our military, our Army, our strengths, and our vulnerabilities are the most studied, analyzed, and wargamed in the world. Consequently, our enemies know that the United States seeks overmatching combat power at times and places of our choosing. They know that U.S. combat forces can drop on top of them in the middle of the night. They also know of our Achilles' heel—a long, vulnerable sustainment tail that extends from the individual fighter back to the U.S. industrial base (that is, from mud to space to factory).

With this obvious vulnerability known throughout the military world, how does the United States keep an intelligent, determined enemy off its tail? One possibility is to sustain our forces asymmetrically while fighting the enemy asymmetrically.

Just what is meant by asymmetric sustainment? The term "asymmetric" refers to a lack of similarity, balance, or arrangement between sides. This occurs when one side has a capability, condition, size, shape, or position that the other side cannot counter. Asymmetric sustainment, therefore, occurs when the United States sets the strategic, operational, and tactical conditions—before, during, and after commencement of operations—so that the enemy cannot interfere significantly with the provisioning of U.S. forces.

As our military transforms, can asymmetric sustainment become the revolutionary pathway to rapid and assured provisioning of sustainment to forces worldwide across the full spectrum of military operations? Can it guarantee the Army's ability to build and maintain overmatching combat power at the point of decision, as determined by the commander on the ground? Will the outcomes be unrivaled sustainment assurance, velocity, visibility, control, accuracy, accessibility, capacity, and protection? I believe the answer is yes.

Avoiding a 21st Century "Slugfest"

It is vitally important to recognize that the Army's sustainment weaknesses may be overlooked or disregarded (and the associated risks accepted) by one or more U.S. maneuver commanders. But an enemy commander may not overlook or disregard these same weaknesses. In fact, sustainment weaknesses may be at or near the top of an enemy commander's critical information requirements list. After all, the enemy commander does have a crucial vote in terms of what, when, where, and how to attack.

Our adversaries seek to understand how the U.S. Army operates in joint and coalition scenarios and then to identify our sustainment strengths and vulnerabilities. An astute enemy could determine that the ways and means of sustaining U.S. maneuver forces have not improved enough to keep up with our ability to maneuver and fight asymmetrically. Said differently, the Army's sustainment rhythm may not match its desired maneuver battle rhythm. If this is true, our Army needs remedies, or a determined enemy will attack the predictable U.S. vulnerability: our ability to sustain a deployed, highly maneuverable fighting force.

An opportunistic enemy's goal is quite simple: to cause the U.S. maneuver force to "consume" itself faster than U.S. sustainers can regenerate the force's lost combat power. Without sustainment replenishment, tactical-level consumption leads directly to operational-level consumption, then, ultimately, to an old-fashioned pause in Army air-ground operations. Until sufficient combat power is restored, a force-on-force, attrition-based slugfest could be precisely what ensues and what the adversary desires in that particular phase of his campaign. Without exaggerating the risks, our sustainment culture must become dramatically less vulnerable to enemy interference.

Enemy Assessment of U.S. Sustainment

From an intelligent enemy's point of view, what are the primary U.S. sustainment-related conditions that can be exploited to his advantage? To an enemy, numerous conditions in the U.S. military's sustainment culture contribute to our sustainment-related vulnerabilities and sometimes signal our military intentions. Here are some conditions to consider—

• The United States is slow to respond militarily to a festering crisis. Political and diplomatic efforts frequently delay an overt and decisive military response. With the intensity of current media coverage, U.S. and coalition intentions, plans, and unit movements are difficult to keep secret. The entire world is the audience for what the U.S. military does.

• A Presidential Reserve Callup (PRC) is required routinely since the majority of the Army's sustainment capabilities resides in the Reserve components (RC). A PRC and subsequent mobilization consume precious time.

• U.S. seaports, airfields, depots, arsenals, Defense contractor assembly plants, and distribution centers are difficult to secure and defend. At U.S. military installations, preparations are required to raise the readiness postures of tenant units. The current readiness model and reporting system are flawed.

• Many U.S. deployment and sustainment decisions can be predicted, based on a knowledge of ports, terrain, road networks, and time and distance factors.

• Activities and sustainment of U.S. Special Operations Forces occur early on the road to war. Army Pre-positioned Stocks (APS) vessels sailing to a joint operations area (JOA) also can indicate U.S. intentions. At least one deep draft seaport is required for oceangoing vessels because APS vessels require deep draft berths.

• At least one aerial port of debarkation is required for U.S. force flow. Normally, the Air Force deploys an airfield support package that precedes the influx of Army maneuver forces. The United States does not routinely flow forces into a JOA while maintaining unit integrity. Most troops arrive by air; most equipment arrives by sea. U.S. sustainment units have considerable equipment that is outsized and requires strategic lift assets (C–17 or C–5 cargo aircraft or sealift vessels) for movement.

• The Army sustainment posture is fragile during entry operations. Ports of debarkation are vulnerable to attack. Joint command and control arrangements for port defenses are problematic.

• In a contingency, the United States establishes at least one large intermediate staging base (ISB) and at least one stationary forward operating base (FOB) in the region. The United States seeks contracts with regional industries and merchants for supplies, services, facilities, and labor to support bases. U.S. services and coalition partners compete for indigenous resources. Army advance parties and advance echelons arrive at ports of debarkation before their units' main bodies arrive.

• Army aviation units are among the most difficult organizations to deploy strategically into a JOA. Ironically, Army aviation lift capability is critical to sustainers at the commencement of operations.

• The Army sustainment community does not have aerial distribution capabilities. The senior U.S. maneuver commander allocates aerial assets. Aerial assets normally are not dedicated for distribution missions. Air delivery usually is for emergencies only. Army air medical evacuation assets deployed to a JOA usually are limited. Army rotary-wing lift assets are extremely expensive, difficult to maintain, large consumers of fuel, and highly prized targets to an enemy.

• Sustainment of U.S. military forces is a service responsibility. Title 10 of the U.S. Code prevents or complicates truly joint sustainment. RC sustainers and units may not be familiar with their supported units and the equipment fleet they must support. The Army's automated sustainment processes used in garrison are not necessarily the same processes used when units are deployed. The Army is weak at reverse (retrograde) and lateral logistics flow.

• U.S. sustainment operations proceed slowly in poor weather and terrain. Ground transport vehicles laden with heavy containers and traveling over secure routes at approximately 25 miles an hour remain the Army's primary means of distribution.

• The Army frequently is forced to mass its sustainment resources in the JOA. At such times, sustainment bottle-

necks occur rapidly. It can take weeks to establish an effective U.S. and multinational distribution network. Throughput distribution is attempted when possible. Distribution "seams" among the services and echelons cause delays and increase the footprint, which increases force vulnerabilities.

• The Army requires enormous quantities of fuel, water, munitions, and other consumables on a daily basis. In the Army's acquisition and procurement processes for new weapon systems, the reliability, maintainability, and supportability requirements frequently are traded for increased lethality and survivability or reduced item prices. The Army requires large numbers of civilian weapon system contractors in a JOA to maintain combat power.

• The productivity of deployed sustainment units is reduced when they must perform security tasks and displacement operations. U.S. maneuver unit soldiers and their leaders may believe that protecting sustainment nodes and securing ground lines of communication (LOCs) are inappropriate missions that reduce their combat capabilities. However, sustainment units are neither trained nor equipped adequately for effective protection against a world-class, well-armed, determined enemy. U.S. sustainment headquarters also may not be authorized the command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) suite that maneuver headquarters are.

• Poorly constructed bridges and poor road conditions can prevent units from achieving desired rates of ground movement. The United States avoids fighting and sustaining forces in an urban environment. U.S. thin-skinned vehicles and their cargo and passengers are easy prey.

All of the above conditions characterize the Army's sustainment culture and create opportunities for a clever and dedicated enemy. What can the Army do to change its sustainment culture?

Combining Asymmetric Sustainment Conditions

Fortunately, there are conditions that, when combined, will create a revolutionary asymmetric sustainment environment that prevents any significant enemy interference. With these combined conditions in place, here is a look into the future at an asymmetric-sustainment Army—

• Strategically, the Army's sustainment focus is twofold: part of the Army's sustainment force is expeditionary in design, and part is focused exclusively on homeland security sustainment. Contractors could be used to provide daily sustainment to forces dedicated to homeland security.

• The Department of Defense (DOD) and the armed services stay prepared to conduct and sustain preemptive strikes. The U.S. Special Operations Command is designated a "supported command" instead of a traditional "supporting command." This has significant implications for improved sustainment readiness, training, urgency, force structure, and command and support relationships.

• Garrisons become tactical assembly areas before troop deployments. Deployment equates to force employment. Forces flowing into the combat zone maintain their unit integrity.

• U.S. depots, arsenals, assembly plants, and distribution centers are located underground for increased security. Airstrips for new super-short takeoff and landing (SSTOL) aircraft and landing pads for a new family of vertical takeoff and landing (VTOL) aerial vehicles are located adjacent to the underground facilities. The primary DOD modes of transport are air and high-speed sealift, although other, slower modes remain available.

• One commander is designated as the single DOD deployment and distribution process owner. There also is a single deployment and distribution process commander in support of each regional combatant command. Together, these commanders command and regulate a worldwide network that requires fewer adjustments when a crisis occurs. Strategic and theater LOCs are secured when necessary. Rapid throughput distribution, pulsed distribution, and time-definite delivery are part of the sustainment culture. Standing, joint theater logistics commands exist.

• Army sustainment can arrive in a JOA and combat zone at more entry points. This reduces force vulnerability. Shallow-draft high-speed sealift (SDHSS) vessels; theater support vessels (TSVs); APS vessels that do not require docking to offload; and a new family of all-weather, day-and-night SSTOL and VTOL aircraft create new sustainment options. The enemy is not able to determine with certainty where and how U.S. sustainment will enter and exit the JOA and combat zone.

• Speed, provided by TSVs, SDHSS vessels, and airlift by both current airframes and a new family of SSTOL and VTOL aircraft, some of which can self-deploy, contributes to sustainment security. The new VTOL aerial sustainment vehicles are relatively inexpensive, manned and unmanned, easily maintained, simple to operate, and have limited stealth qualities. They also can fly farther and faster than current rotary-wing assets. The Future Tactical Truck System (FTTS) incorporates cross-country speed enhancements. The total density of tactical vehicles within the JOA and combat zone is reduced dramatically, contributing to an overall reduction in the sustainment footprint.

• The Army has maneuver forces conducting routine sea-based rotations at all times. Sustainment resources accompany these forces. Some APS vessels are reconfigured as active-duty supply support activities and are staffed continuously. A network-centric C4ISR capability is present. VTOL aerial vehicles are on board to provide rapid ship-to-air-to-shore sustainment replenishment.

• The Army has a self-deployment capability for forces engaged in forcible- and early-entry operations. This includes multifunctional sustainment packages that do not rely on strategic airlift or sealift for movement. Although an ISB may be required in the later phases of a campaign, it is not required for initial entry operations. FOBs are more agile; in fact, an FOB may be composed of sealift vessels.

• The total weight and cube of a deploying force and its associated sustainment tonnages are reduced dramatically. Small, universal cargo distribution pods (containers) enter the Defense Transportation System.

• RC sustainment units are integrated into Active component sustainment organizations for day-to-day training, command, and control. Sustainment force packaging and pooling are more decentralized. Sustainment replenishment and mission staging operations are combat missions.

• The DOD Uniform Material Movement and Issue Priority System (UMMIPS) allows only four requisitioning and distribution priorities: priority 1, war/contingency-urgent; priority 2, war/contingency-pulsed; priority 3, mission essential/not mission capable-pulsed; and priority 4, routine-pulsed.

• Customer wait time (CWT) is measured in minutes and hours instead of days and weeks. The DOD and theater distribution process commanders are held accountable for CWT and time-definite delivery standards.

• A joint, distribution-based "sense and respond" sustainment system exists. Embedded diagnostic and prognostic technologies are incorporated in materiel systems. Asset visibility and in-transit visibility are part of the sustainment culture. Robots are exploited in numerous ways; for example, in maintaining security and leader-follower operations.

• Reliability, maintainability, and supportability requirements are designed into each new major end item. With the exception of battle damage, equipment does not require extensive maintenance. The reliability, maintainability, and supportability of systems, along with improved munitions, fuel efficiencies, and vehicle-produced potable water, are crucial to having a right-sized sustainment footprint.

• Real-time readiness of equipment and units is monitored automatically and reported electronically to various headquarters. Automated systems used in combat and in garrison are identical.

• Since the Army is expecting to operate in a nonlinear, noncontiguous, widely dispersed manner, sustainment must be provided in an omnidirectional, anticipated, and on-demand manner. This includes multimodal sustainment in an urban environment.

• Armed VTOL aerial sustainment sprints (operating at speeds up to 300 miles per hour and ranges up to a 400-mile flight radius) are recognized as the primary method of reaching supported forces in combat. Once the sustaining and supported forces link up, a rapid "pit stop" operation takes place. When the "pit stop" drill is completed, the supporting element returns to its sustainment base with empty cargo distribution pods, unserviceable components to be repaired, any casualties in need of higher level medical care, and, possibly, enemy prisoners of war. It then prepares to pulse sustainment to another supported force. Aerial sustainment corridors vary frequently, depending on the threat and the locations of supported units.

• Deployable sustainment early-entry command posts (EECPs) are containerized, networked, and highly mobile. Fewer EECPs are required. EECPs are staffed to operate continuously and equipped with required C4ISR systems. The common operational picture (COP) exists to provide situational awareness. Fewer ad hoc command arrangements are required. Reach operations are conducted routinely. Home station operations centers (HSOCs) assist the deployed force. Telemaintenance and telemedicine improvements, as well as unit modularity and equipment commonality, reduce sustainment burdens.

• Sustainers have an "offensive" capability, with immediate access to firepower (organic and supporting) to service most enemy target arrays.

The Army today is at a "culture-changing" exclamation point in its history. Three consecutive Army Chiefs of Staff have proclaimed the need for a revolutionary transformation in military logistics. So let's comply. One revolutionary goal can be to adopt the asymmetric sustainment approach to provisioning U.S. forces while simultaneously denying any enemy the opportunity to interfere.

The Army needs asymmetric sustainment to keep pace with its highly deployable and highly maneuverable asymmetric fighting forces. Asymmetric sustainment melds legislation and new policies; innovative joint and Army Objective Force concepts; different mindsets and behaviors; emerging technological enablers; adaptive organizational designs; and a vital "offensive" warrior ethos and capability within the future sustainment force.

Let's baffle our future enemies with asymmetric sustainment. No enemy will enjoy being rendered helpless by its adversary's sustainment force.

Colonel Larry D. Harman currently is assigned to Headquarters, Army Combined Arms Support Command, at Fort Lee, Virginia. Effective 31 July, he will retire from the Army after 30 years of service.

Deployable Communications System Reduces Port Cargo Confusion

by Robert Fowler and Stephen Larsen

Lieutenant General William G. "Gus" Pagonis, who masterminded logistics during the first Gulf War, said that the easiest part of going to war is getting soldiers to the battlefield and the hardest part is getting logistics support to the soldiers. The new, deployable command, control, communications, and computers (C4) systems make it easier to move military cargo through ports to the right place.

A deployable C4 system, known as the Multimedia Communications System (MMCS), is the heart of the Military Traffic Management Command's (MTMC's) mobile port operations centers (MPOCs) and deployable port operations centers (DPOCs). MPOCs and DPOCs are mobile MTMC offices that provide the same information technology capabilities that MTMC personnel have at their home stations. These capabilities include the Worldwide Port System; the Integrated Computerized Deployment System; email and Internet access; and the MMCS communications module, which provides satellite access for the NIPRNET (nonsecure Internet protocol router network), SIPRNET (secret Internet protocol router network), and cargo status reports. MPOCs include tactical vehicles and support small-scale, short-duration contingency operations at secondary ports, and DPOCs are shelterized and are used for major or regional conflicts. MPOCs and DPOCs provide MTMC with C4 systems to control and identify cargo moving through ports and report cargo information to the various Department of Defense intransit visibility systems. Product Manager, Defense-Wide Transmission Systems, is providing the commercial off-the-shelf MMCS suite to MTMC.

During Operation Desert Storm, the United States moved more than 40,000 containers to the theater of operations. With a paper-based supply system and that many containers in theater, the biggest bottleneck in the logistics pipeline occurred where the supplies came off the ships. "More than half of the cargo containers in theater were filled with 'mystery' items," said Corrina Panduri, a project leader with the Product Manager, Defense-Wide Transmission Systems. "Nobody knew where these items—including more than $2.7 billion in spares—were supposed to go." Add the fact that the communications infrastructure in some ports was lacking, and finding items in the maze of pallets and containers was like searching for the proverbial needle in a haystack.

☐ Pictured above is a mobile port operations center (MPOC), which includes a high-mobility, multipurpose, wheeled vehicle (HMMWV) and a tent housing the Multimedia Communications System (MMCS, inset).

Now, thanks to MPOCs, DPOCs, MMCS, and new technological advances such as handheld scanners and radio frequency identification on every air pallet and cargo container, logisticians can keep track of cargo every step of the way. "With MMCS, we can provide immediate information on the location and status of the containers and their contents," said Panduri. "This Web-based tracking system allows personnel working at the MPOC, as well as unit supply personnel, to determine exactly where a given shipment is located and accurately predict a delivery date." The goal is total asset visibility and no more mystery containers, and MMCS is helping MTMC reach the goal. **ALOG**

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Stephen Larsen is the Public Affairs Officer for the PEO EIS at Fort Monmouth, New Jersey.

New DA Pamphlet Details ISB Operations

The Army G–4 has prepared Department of the Army Pamphlet (DA Pam) 700–33, Intermediate Staging Base (ISB) Handbook, to assist Army logistics commanders, planners, and operators in planning and establishing ISBs, particularly at the operational level. What follows is a brief summary of the pamphlet's contents.

Current Army doctrine defines an ISB as a secure staging base established near, but not in, an area of operations. An ISB is task-organized to perform staging, support, and distribution functions as specified or implied by the service support plan or annex in support of the combatant commander's war plan or operation order. Once an ISB is established, the theater logistics headquarters continues to assess the ISB's mission and adjusts its organization in view of sustainment requirements and available resources.

Planning an ISB

An ISB should be planned at a command and control point, where all requirements for joint reception, staging, onward movement, and integration and for theater distribution operations can be determined and phased, and where all available resources to operate an ISB can be allocated. Theater movement planners must ensure that ISB elements are phased appropriately and are placed in the time-phased force and deployment list as early deploying units.

An ISB must support the combatant commander's campaign plan. As staging bases, ISBs are a critical part of the theater infrastructure needed to bring a force ready to perform its mission to the right place at the right time. As support bases, ISBs are part of the theater distribution system needed to cover shortfalls in the theater maneuver sustainment pipeline; they enable U.S. forces to request, receive, sort, maintain, distribute, retrograde, and control the flow of resources within the theater. Although maneuver sustainment is a service responsibility, theater distribution functions are intrinsically joint and may be multinational. ISB planners therefore should prepare an ISB for a joint and perhaps a multinational support role.

As an integral part of the theater distribution system, an ISB cannot be planned autonomously. Centralized planning and management is essential to effective distribution operations. Maneuver sustainment resources allocated to an ISB often will represent trade-offs that must be accepted elsewhere in the distribution system by commanders and planners. An ISB's capabilities should complement the rest of the system and be only what is required for its mission.

The time and other resources needed to ensure the availability of host nation support must be considered. Requirements for site preparation or for construction, repair, or modification of existing facilities for an ISB must be identified to joint engineer support planners. ISB requirements for contractor support must be included in the theater contracting support plan. Planners should confirm the ability of intratheater transportation to link an ISB to transportation nodes in the area of operations and to its customers. An ISB must be planned as part of the theater communications and automation network so theater-level distribution managers have visibility of stocks and capabilities in the area of operations.

Operational-level logisticians planning an ISB may benefit from critical path analysis techniques. One of the most common commercial applications is MS Project 2000. An ISB template has been created to assist the planner. The template allows the use of an existing schedule to make a new schedule to track progress, head off problems, and communicate important information.

Establishing and Operating an ISB

ISB deployment requires centralized planning with decentralized execution. The deployment process is conducted in four phases—

- Predeployment activities, including routine deployment preparations and specific predeployment activities that units accomplish after receiving initial notification, warning orders, and alert orders.
- Movement to, and activities at, the port of embarkation, which normally begin with an execute order. Deploying units are then validated, configured, and moved to the port.
- Movement to the port of debarkation. In unopposed strategic deployments, personnel routinely move by air, while most unit equipment moves by surface transport.
- Joint reception, staging, onward movement, and integration. As part of the in-theater structure required to support the deploying force, ISB echelons must deploy early and primarily by air.

Stocks may be positioned at the ISB in order to surge resupply forward or provide a shorter reaction time or time-definite delivery time to customers in the area of operations. Major items may be pre-positioned at an ISB, particularly if good ground, inland waterway, or sea lines of communication exist between the ISB and the area of operations. System contractors also may be positioned at the ISB to provide depot-level and specialized maintenance support to selected weapon systems.

Copies of DA Pam 700–33 can be found at http://www.army.mil/usapa/epubs/pdf/p700_33.pdf; https://akocomm.us.army.mil/usapa/epubs/pdf/p700_33.pdf; and http://www.usapa.army.mil/pdffiles/p700_33.pdf. **ALOG**

NEWS

(News continued from page 1)

readiness level when the campaign began and sustained that level to the Iraqi capital. He attributed the success to people, readiness, and Army transformation.

Major General Ann E. Dunwoody, Commander of the Military Traffic Management Command, cited the influence of sealift and improved port infrastructure in Iraqi Freedom's success. Sealift vessels were able to move 15 million square feet of cargo into the theater from 9 ports in only 60 days. That compares to moving 3.3 million square feet of cargo from 20 ports over 6 months in Operation Desert Shield. Major General Robert T. Dail, Commander of the Army Transportation Center, also noted the importance of transportation, in particular the new theater support vessel.

According to Michael W. Wynne, Principal Deputy Under Secretary of Defense for Acquisition, Technology, and Logistics, Iraqi Freedom demonstrated the Army's shift from an emphasis on mass to an emphasis on velocity. This shift is being dictated by the Information Age: "Warfare now moves at the speed of information."

General Juskowiak observed that the goals of Logistics Transformation are to improve strategic mobility and deployment, reduce the sustainment footprint, and cut operating and sustainment costs. Attainment of these goals depends on technological advances: "A quantum leap in technology will make combat and logistics systems more agile, lethal, and sustainable." Secretary Wynne also noted the key role played by technological investments, pointing out that science and technology is being allotted 3 percent of the Army budget.

General Juskowiak said that the two largest items in the sustainment chain continue to be fuel and water. To reduce demand for those commodities, the Army is researching the use of hybrid electric engines and embedded water production technology in vehicles. The Future Tactical Truck System will come in two variants that will replace vehicles in the Army fleet ranging from large transporters to the high-mobility, multipurpose, wheeled vehicle (HMMWV), thereby reducing the stocks of spare parts needed to support multiple vehicle models.

In highlighting progress in logistics transformation, Secretary Wynne cautioned, "The logistics tail is still taking up space that should be going to the combat tooth." General Juskowiak said that transformation "won't be easy and it won't be cheap," but Army logistics has begun to "turn the corner."

DOD ESTABLISHES JOINT PEO FOR CHEMICAL AND BIOLOGICAL DEFENSE

The Department of Defense (DOD) announced on 25 April the formation of the Joint Program Executive Office for Chemical and Biological Defense (JPEO–CBD). This DOD initiative will focus on the protection of soldiers, sailors, airmen, and marines from battlefield chemical and biological weapons.

The JPEO–CBD was formed from the Army's existing Program Executive Office for Chemical and Biological Defense and current Navy, Air Force, and Marine chemical and biological defense program offices. The JPEO–CBD will streamline chemical and biological acquisition and take advantage of the unique capabilities each military service offers.

The JPEO–CBD will be responsible for research, development, acquisition, fielding, and life-cycle support of chemical and biological defense equipment and medical countermeasures supporting the National Military Strategy. Operation Iraqi Freedom and the threat of the use of weapons of mass destruction by terrorists have highlighted the importance of defense against chemical and biological warfare.

Some of the JPEO–CBD programs include chemical and biological detection devices; medical vaccines, pretreatments, therapeutic and diagnostic equipment; individual protective masks and suits; collective protection shelters; decontamination equipment and systems; and warning and reporting systems. The JPEO–CBD programs also will include developing and fielding equipment for the Army National Guard's weapons of mass destruction civil support teams and for installation and force protection.

The Army remains the executive agent for the Chemical and Biological Defense Program. The JPEO–CBD will report to the Army and Defense acquisition executives.

LOGSA OFFERS MADE-TO-ORDER PLLs AND ASLs

The Logistics Support Activity (LOGSA) at Redstone Arsenal, Alabama, now offers users in the field help in developing prescribed load lists (PLLs) and authorized stockage lists (ASLs) through its Logistics Integrated

Data Base (LIDB). The processes now available in the LIDB assist users in determining the class IX (repair parts) stockage requirements for supporting their organic equipment.

LIDB users can compute peacetime and contingency PLLs and ASLs whenever needed. After logging in and moving to the Support Item Requirements module, a user can select either the peacetime model or contingency model from the Report Criteria tab. The peacetime model allows the user to select only limited parameters (the location, the level [PLL or ASL], and the number of days of the operation). The contingency model permits the user to select and vary many more parameters (such as resupply or no resupply, availability goals to be met by the model, customer wait time, percentage of equipment in use each day, equipment survivability in combat, optimization preference, and scenario horizon). Changes to these variables let the user complete "what if" drills to match different potential operating conditions. After developing his product, the user can save the results in text files to include the PLL or ASL, end item applications of each support item, and summary information about the product.

Although PLL and ASL products represent a powerful tool for the warfighter, the Support Item Requirements module incorporates more features to support the soldier. A user can determine all of the support items for an end item, or he can determine all of the end items associated with a specific support item. A user also can extract on-hand equipment densities from the LIDB Asset module (formerly known as the Continuing Balance System-Expanded) for use in many of the Support Item Requirements processes. Finally, the user can compare the support items on two or more end items and determine the support items that are considered common or unique to those end items. An ASL can be added to the mix for identification of possible repair part turn-ins determined to be excess.

Anyone requiring LIDB access can go to www.logsa.army.mil and fill out a Systems Access Request. Needed products can be obtained quickly by contacting amxlsmlb@logsa.redstone.army.mil.

STRYKER BRIGADE COMBAT TEAM OPERATES AGAINST NTC OPFOR

The Army's first Stryker brigade combat team (SBCT)—the 3d Brigade, 2d Infantry Division, at Fort Lewis, Washington—completed a brigade field training exercise at the National Training Center (NTC) at Fort Irwin, California, in April. In Operation Arrowhead Lightning I, the SBCT conducted mid- to high-intensity operations against the NTC's opposing force

☐ Two SBCT soldiers guard the perimeter as their squad reconfigures their Stryker infantry carrier vehicle after it was offloaded from a C–130 transport (in the background) at the NTC during Operation Arrowhead Lightning I.

(OPFOR), testing its organization, personnel, and equipment. The SBCT used its speed, agility, enhanced situational awareness capabilities, and intelligence assets to operate throughout an extended battlespace.

The operation began with the transport of eight Stryker variants by C–130 aircraft from the Southern California Logistics Airport near Victorville, California, to Bicycle Lake Army Airfield at the NTC. This was the first tactical deployment of all eight Stryker variants by C–130s. Last July, the infantry carrier vehicle deployed by C–130 to the NTC. (See article in the March-April issue of *Army Logistician*, page 1.) The other Stryker variants are the commander's vehicle, fire support vehicle, mortar carrier, engineer squad vehicle, medical evacuation vehicle (see related article on page 48), reconnaissance vehicle, and antitank guided missile vehicle. Two more variants—the nuclear, biological, and chemical vehicle and the mobile gun system—are scheduled for introduction next year.

The SBCT engaged in Operation Arrowhead Lightning II at the Joint Readiness Training Center at Fort Polk, Louisiana, in May. This exercise represented the next step in operational evaluation of the SBCT. The operational evaluation will determine the readiness of the SBCT for operational employment and the effectiveness of the SBCT organizational design.

CIVIL SUPPORT TEAMS GET NEW EQUIPMENT

Since last summer, the Army National Guard's Weapons of Mass Destruction Civil Support Teams (WMD–CSTs) have gained two new pieces of high-tech

equipment that will improve their ability to identify both chemical and biological substances. The Fourier transform infrared (FTIR) and the polymerase chain reaction (PCR) help the teams to be more efficient in their role as the "eyes forward" for state and national public health laboratories.

According to Major Julie Bentz, a science advisor on homeland defense issues to the National Guard Bureau, the two pieces of equipment are not based on new science. However, new technology is allowing them to be more mobile than ever before, enabling the WMD–CSTs to perform screening tests in the field.

The FTIR uses an infrared laser to identify chemical molecules or rule out biological molecules in about a minute. Before this was available, lab technicians had to rely on handheld assay tests to try to identify substances. These tests would rule out certain chemicals but not always identify a mystery substance. Now technicians will be able to determine not only what a mystery substance *is not* but also what it *is*.

☐ A member of the Virginia Army National Guard's 34th WMD–CST discusses new equipment with visitors to a static display set up recently in the Pentagon's center courtyard.

The PCR identifies biological warfare agents, such as anthrax, ricin, smallpox, and botulinum, and biological pathogens, including lysteria, e-coli, and salmonella, in about an hour. About the size of a carry-on suitcase, this machine can get results from small or diluted samples. These capabilities help the team assist an incident commander to get a handle on the situation much quicker than might otherwise be possible. "The faster you can get the incident commander in control of the situation," Bentz said, "the quicker you can provide a sense of relief and support to the community."

The total number of WMD–CSTs now certified is 32. In March, the Department of Defense notified Congress that the Alabama and Kansas Army National Guard's WMD–CSTs were certified. The 46th WMD–CST, stationed in Montgomery, Alabama; and the 73d WMD–CST in Topeka, Kansas, are ready to assist civil authorities in responding to a domestic weapons of mass destruction incident and have the skills, training, and equipment needed to be proficient in all mission requirements.

WEB-BASED SYSTEM NOTIFIES USERS OF PUBLICATION CHANGES

The Army G–4 has instituted a system that allows logisticians to learn automatically about publication changes. The Army G–4 Publications Enrollment Notification System (PENS) is a web-based system that allows logisticians to request automatic notification whenever specific G–4 regulations and pamphlets have been changed or rescinded. The new system will assist logisticians since the Army no longer prints and mails hard copies of regulations and pamphlets and changes to them.

To sign up for PENS, a user should follow the onscreen enrollment procedures—

- Go to the G–4 Digital Publications Management System Web site at https://lia13-www.army.mil/dpms/extPens.html.
- Enter his email address (preferably an Army Knowledge Online [AKO] email address).
- Click on the "Submit Request" button.
- On the next screen, select the publications about which he wants to be kept informed and then submit the request.

The user will receive an email message to acknowledge his participation, along with an automated offer to cancel the request if he changes his mind. Following sign up, the user will receive an email notification when one of the regulations or pamphlets he selected has been changed or rescinded. That notification will take place on the same day the publication change occurs.

FIRST CLASS GRADUATES AT ALMC SATELLITE CAMPUS

Twenty-four Army officers graduated from the first Army Acquisition Basic Course offered at the Army Logistics Management College's (ALMC's) new Huntsville, Alabama, campus. The fast-paced, graduate-level course prepares officers and civilians for entry-level positions in the Army's acquisition workforce. Following the 21 March graduation, Colonel Robert J. McNeil, Commandant of ALMC, said, "The graduates of this

course leave with broad-based knowledge that has prepared them to meet the challenges of equipping the Army's Objective Force."

More information about the Army Acquisition Basic Course and ALMC's new campus at Huntsville may be found at www.almc.army.mil/AMD/Huntsville/aaqc_homepage. htm.

ARMY COMPLETES COMPREHENSIVE STUDY OF CIVILIAN WORKFORCE

The Army Training and Leader Development Panel completed its final study, on Army civilians, in March. The study was designed to identify training and leader development requirements for current and future Army civilians. The number of contacts and breadth of collection methods used in the study produced the most thorough examination ever conducted of Army civilian development.

The study concluded that current Army policies for developing civilian leaders fall well short of Army plans and do not meet the expectations of Army civilian employees. The study notes that the future Army environment will require a higher level of adaptability and self-awareness among civilians.

The study highlighted five recommendations—

- Civilian training, education, and leader development should be an Army priority.
- Civilian and military individual training, education, and development should be integrated where and when appropriate.
- The relationship among the four Army cohorts (officer, noncommissioned officer, warrant officer, and civilian) should be improved.
- A training and development paradigm that incorporates lifelong learning should be created.
- Developing interpersonal skills should be a priority.

To begin the process of change, the study recommends that the Army Chief of Staff—

- Publish a statement about the importance of the interdependent relationships of the Army Team.
- Designate Army civilians as members of an Army Civilian Corps.
- Support reaffirmation of the oath of office for Army civilians.
- Adopt a new Army Civilian Creed.
- Implement combined orientation training for Senior Executive Service civilians and general officers.
- Implement a strategic communications campaign plan for the Army Civilian Corps.
- Establish a Civilian Advisory Board to the Army Chief of Staff.
- Publish an Army Civilian Handbook.
- Commit to protecting resources for civilian leadership development under the leadership of the Army G–3.

The Army Training and Leader Development Panel was chartered by the Army Chief of Staff, General Eric K. Shinseki, in June 2000. Its previous studies addressed commissioned officers (completed in May 2001), noncommissioned officers (May 2002), and warrant officers (July 2002).

The panel will complete its work with a final report on training and leader development that will create operational commanders and leaders who can meet the demands of the National Military Strategy.

PERSCOM AND AR–PERSCOM MERGE

The Army announced in April that it will create a single command to perform the functions of the Total Army Personnel Command (PERSCOM) in Alexandria, Virginia, and the Army Reserve Personnel Command (AR–PERSCOM) in St. Louis, Missouri. The new command will integrate the two existing organizations as a multicomponent field operating agency (FOA) under the Army G–1. The Army National Guard will integrate functions where possible, and the Civilian Personnel Operations Center Management Agency will merge into the FOA at a later date.

The merger is one of several recommendations made by an Army-level human resources integrated process team (HRIPT) that convened last year. Former Secretary of the Army Thomas E. White later approved these recommendations. The HRIPT recommendations are far-reaching and complex and involve the active Army, Army National Guard, Army Reserve, civilian employees, and contractors.

"The organizational realignment of PERSCOM and AR–PERSCOM is a historical milestone in Army Transformation," said Lieutenant General James R. Helmly, the Chief of Army Reserve. "This integration will serve as the foundation for changing the manner in which we care for the Army's most valuable resource and foundation, its people."

PERSCOM and AR–PERSCOM will retain their respective names and unit insignia until a date to be determined, Army officials said.

NONDESTRUCTIVE TESTERS TO MEET

The 51st Defense Working Group on Nondestructive Testing (DWGNDT) will meet 4 to 6 November at the Ramada Plaza Beach Resort in Fort Walton Beach, Florida.

Engineers, scientists, technicians, and managers from all commands and U.S. Government activities who are responsible for developing or applying NDT methods in research, engineering, maintenance, and quality assurance will attend. The Army, Navy, Air Force, and Defense Logistics Agency alternately host the meeting. This year it is hosted by the 361st Training Squadron, Detachment 2, at Naval Air Station Pensacola.

Those interested in presenting a problem or a technical paper at the conference should call (619) 556–2869 or send an email to kernsmj@simasd.navy.mil. The format for problem and technical paper abstracts is available on the DWGNDT Web site, http://hometown.aol.com/dodndt.

STRYKER AMBULANCE MOVES WOUNDED OUT OF HARM'S WAY

The new Stryker medical evacuation vehicle (MEV), which debuted early this year at Fort Sam Houston, Texas, offers front-line medical personnel the same mobility and protection now afforded to combat units. In some cases, this means that medical personnel can go right to the point of injury and extract the wounded.

The armored MEV can carry six ambulatory patients or four litter-borne patients. Its three-person crew—a driver, a vehicle commander, and a medical attendant—are all trained medical staff with military occupational specialty 91W, healthcare specialist.

The MEV's innovative litter lift system reduces the manpower required to load patients. The device slides a patient into the MEV onto a tray in the center of the vehicle. The tray is then slid into place, and two arms on a jackscrew lift the patient into position. The lifting mechanisms and support columns stow vertically when transporting ambulatory patients. The center medical attendant seat allows the attendant to view and monitor all patients simultaneously. Onboard oxygen is carried in four 425-liter cylinders mounted to the floor, with tubing routed to all seats and litter positions.

More than 20 MEVs have been built to date. Seventeen are deployed with the first Stryker brigade combat team, and the remaining vehicles are being used for testing.

☐ The roofline of the MEV's rear compartment is 10 inches taller than the standard interim armored vehicle, which gives the medical attendant room to treat patients.

DIGITAL IMAGERY HELPS SAVE LIVES AND LIMBS

Cutting-edge American technology in the hands of the soldiers on the small radiology staff of the 86th Combat Support Hospital at Camp Udairi, Kuwait, is making a difference for soldiers who have been wounded on the battlefield.

The technology is a Philips Digital Radiography system. The system works much like a digital camera, except the image is a radiograph showing bones and joints instead of a photo of a face or an arm.

A radiology technologist takes the image and stores the data on an imaging plate. The plate is placed into a processor, and the data are transferred to a laser scanner that converts the data to a digital image. "Once the image is in the computer, we can manipulate the image digitally," says Specialist Megan Allen, a radiology technologist. "The radiologist reads the image and passes the image to the surgeon. We then copy it to a CD. After surgery, as patients are transferred to the rear for follow-on care, the CD with the image goes with them."

Digital radiography does not require chemicals and flimsy x-ray sheets, which eliminates the need for requisitioning, transporting, and accounting for these additional supplies. Transporting and disposing of the hazardous material produced from using chemicals also is eliminated.

"It's definitely better than conventional film screen radiography," says Major Kathleen Groom, the combat support hospital's radiologist. "Images can be manipulated by magnification, inversion, adjustment of light, and contrast. I can review the image on the screen, or I can print the image out. The greatest benefit is [that] the process limits radiation exposure to the patient," she adds. "We can process and examine the x ray more quickly, which limits the time from x ray to treatment. And quality medical treatment is what it's all about here."

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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