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Cover: Medical logisticians are finding innovative ways to deal with the strain of back-to-back military operations. Articles beginning on pages 6, 8, and 12 discuss medical support provided to troops deployed to Operation Iraqi Freedom, the impact of the war on a major medical center outside the theater, and the resupply of medical materiel. On the cover, a soldier injured in Iraq arrives at the Landstuhl Regional Medical Center in Germany for treatment.

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ALOG NEWS

SDDC MAKES HISTORIC EQUIPMENT MOVES

During the first 4 months of 2004, the Surface Deployment and Distribution Command (SDDC) carried out the largest move of U.S. military equipment since World War II. Elements of eight Army divisions were moved to or from Operation Iraqi Freedom in Iraq and Operation Enduring Freedom in Afghanistan. Large quantities of Navy, Air Force, and Marine Corps equipment also were moved. The equipment deployment was one-third larger than the original deployment for Operation Iraqi Freedom. The surge movements for deployment occurred in late January, and redeployment of equipment continued into the spring.

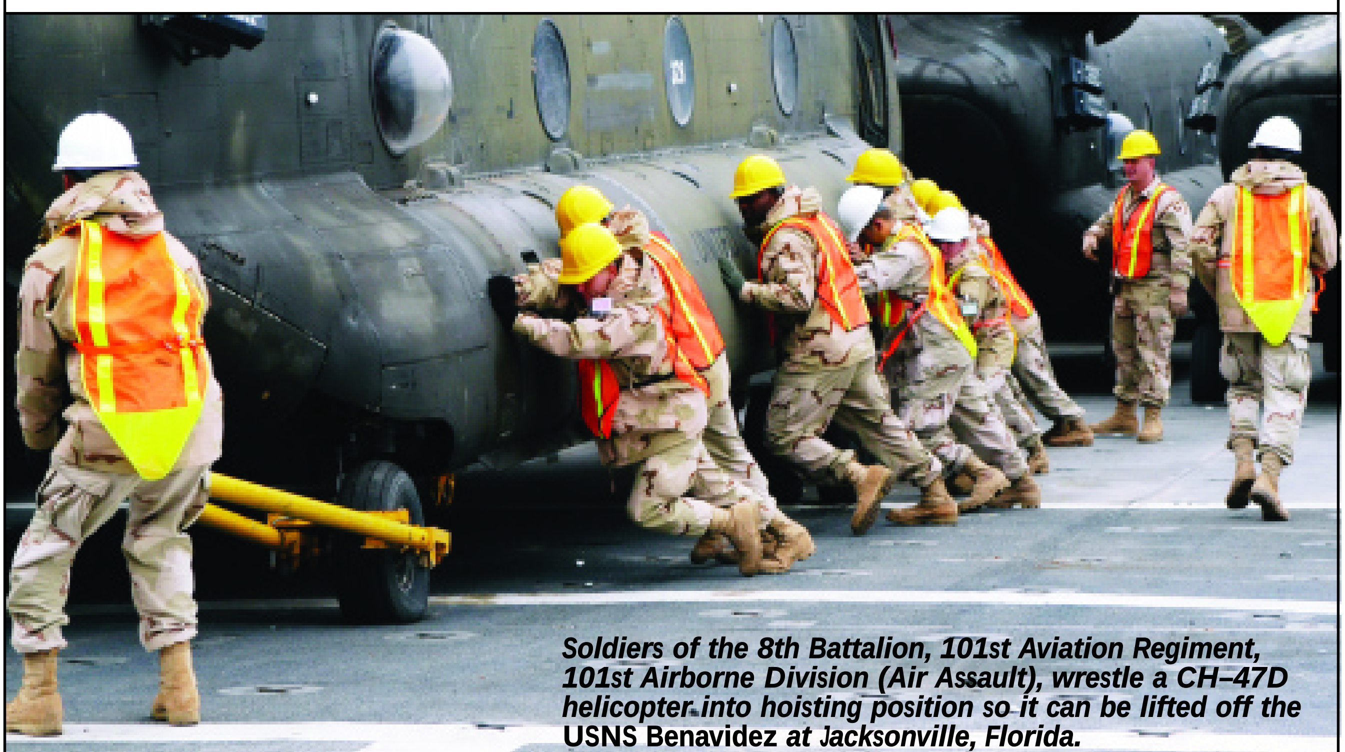
The moves involved approximately 300 vessel movements through east and gulf coast ports with connections in Kuwait. Military Sealift Command ships and chartered commercial vessels were the principal equipment movers, and approximately 16,000 containers were moved onboard commercial U.S. vessels.

The main domestic ports used for the moves were the ports of Corpus Christi, Texas; Beaumont, Texas; Charleston, South Carolina; Philadelphia, Pennsylvania; and Jacksonville, Florida. The primary port used in the theater was the port of Ash Shuaybah, Kuwait.

Army units returning to home stations included the 101st Airborne Division (Air Assault) of Fort Campbell, Kentucky; the 4th Infantry Division (Mechanized) of Fort Hood, Texas; the 1st Armored Division of Wiesbaden, Germany; the 2d Armored Cavalry Regiment (Light) of Fort Polk, Louisiana; the 2d Brigade, 82d Airborne Division, of Fort Bragg, North Carolina; and the 173d Airborne Brigade of Vicenza, Italy.

SDDC deployed elements of the 1st Infantry Division (Mechanized) of Wurzburg, Germany; the 1st Cavalry Division of Fort Hood, Texas; the 25th Infantry Division (Light) of Schofield Barracks, Hawaii; and a Marine Air-Ground Task Force from the 1st Marine Division at Camp Pendleton, California. While most units are going to Iraq, the 25th Infantry Division brigade and a U.S. Marine Corps battalion will succeed elements of the 10th Mountain Division (Light Infantry) in Afghanistan.

Among the National Guard units deploying were the 30th Infantry Brigade (Mechanized) from North Carolina; the 81st Armor Brigade (Separate) from Washington; and the 39th Infantry Brigade (Light) from Arkansas.



Soldiers of the 8th Battalion, 101st Aviation Regiment, 101st Airborne Division (Air Assault), wrestle a CH–47D helicopter into hoisting position so it can be lifted off the* USNS Benavidez *at Jacksonville, Florida.

(ALOG NEWS *continued on page 46)*

LOG NOTES

SBCT Supports Future Force

As one who participated in the design of the Brigade Support Battalion (BSB) at the Combined Arms Support Command at Fort Lee, Virginia, I would like to address some of the concerns expressed in the article "Logistics Risk in the Stryker Brigade Combat Team" in your January–February 2004 issue.

When former Army Chief of Staff General Erik K. Shinseki proposed an interim force in October 1999, it was in the wake of Task Force Hawk's protracted deployment to Albania in support of Operation Allied Force. Further, the Task Force's mix of multiple-launch rocket systems and Apache attack helicopters was ill-suited as a ground threat to complement the Air Force's bombardment of Serbian forces in Kosovo. Rather, a rapidly deployable interim force was needed. In fact, Kosovo was used as the wargaming template in the design of the Stryker Brigade Combat Team (SBCT). Simply put, the SBCT provides a capability that previously did not exist.

Although the author may deem 96 hours as unachievable, it serves as a standard. Moreover, if not 96 hours, then how long? It is anticipated that, in the future operating environment, land forces will not have the time to mass combat power as demonstrated by the buildup of U.S. forces in Kuwait before Operation Iraqi Freedom (OIF). Rather, a forced entry followed by an early-entry force such as the SBCT could prove decisive. Our adversaries have learned their lessons from OIF. They are now likelier to develop anti-access capabilities that will hinder our ability to mass forces.

The author identifies valid risks, but none is particularly unique to the SBCT. As for its austere design, the SBCT is not a standalone fighting force. For sustained combat operations, it would be attached to a heavier unit. Admittedly, the SBCT is optimized for stability and support operations and for small-scale contingencies. While the vulnerability of long lines of communication is a concern, it also bedeviled operations in the European theater in World War II and, to a lesser extent, in Operation Desert Storm. Lastly, no force is immune to the hazards of unforeseen increased consumption.

When designing the SBCT, combat service support planners proved innovative despite the constraints. A new approach to logistics is evinced by resupplying only as needed, rapidly exploiting contracting assets in theater, and requiring a commonality of vehicle parts. These are just a few of the many changes in the combat service support design of the SBCT. Simply slimming down a heavy unit, while comforting in its familiarity, would not be the transformative driving force that is required for future warfare.

Finally, the Army has done a masterful job of translating a vision into a deployed force within 4 years. The SBCT and BSB are imperfect—as every type of unit has its weakness—and growing pains are to be expected. However, the combination of lessons learned, advances in technology, and a greater appreciation of the Stryker sustainment concept will accelerate the maturation of the Interim Force and ultimately contribute to an effective Future Force.

Major James J. McDonnell
Kandahar, Afghanistan

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CORRECTION

In the March-April issue of *Army Logistician*, on page 20, the ship in the photo was misidentified as the *USNS Antares*. The photo actually shows the *M/V Antares*. We apologize for the error.

Improving Intratheater Joint Distribution

BY CAPTAIN ROBERT P. MANN, JR.

The way forces are employed is changing. Current operations in Iraq have shown how operational forces can bypass cities and focus on the enemy. The quick advance of Army combat forces from Kuwait to Baghdad required support units to stretch their capabilities in order to keep pace. In Operation Iraqi Freedom, the Marine Corps has operated at greater distances from the sea than those covered in their doctrine. They have demonstrated the ability to conduct operations over large distances for a sustained period. Their force structure requires theater-level support to make this possible. The Air Force has established forward bases in southern Iraq to provide close air support to the combat units. To sustain themselves, these forces need more than can be flown in economically.

It is no longer realistic to expect support units that are maintaining large stocks to keep pace with fast-moving combat units. As lessons from Iraq emerge, logistics will change to ensure that combat troops are able to fight the enemy and not have to fight the supply and distribution system. Joint distribution will be required in the future. However, experience in supporting Operation Enduring Freedom has demonstrated that command and control problems are a significant obstacle to achieving intratheater joint distribution.

Operation Enduring Freedom

During Operation Enduring Freedom, the U.S. Central Command (CENTCOM) established a southern theater logistics hub at an air base in Southwest Asia to support ground forces in Afghanistan and Pakistan. At this hub, the Army organized a logistics task force (LTF), consisting of a general support supply company headquarters and supply platoon, a class IX (repair parts) section and maintenance support team from a nondivisional direct support maintenance company, and a platoon from a cargo transfer company. The cargo transfer platoon had an attached arrival and departure airfield control group that worked closely with an Air Force tanker and airlift control element and an aerial port squadron; these organizations worked together on the flight line to ensure that the right supplies reached the supported unit at the right time.

The LTF worked with an Air Force air expeditionary group (AEG) to transfer cargo from strategic airlift to intratheater airlift. The LTF also had the missions of receiving ground shipments and configuring them for intratheater lift and storing CENTCOM-directed authorized stockage list (ASL) equipment.

The LTF had many growing pains, including problems associated with dividing and assigning responsibility for transload functions among the services and establishing Standard Army Management Information Systems (STAMIS) connectivity through various communication architectures. The greatest problems, however, were associated with command and control (C2).

Since the AEG and the LTF were under the direct control of their respective component commanders, some operations were not properly synchronized. For example, the LTF was in direct contact with the brigade combat team and was able to determine requirements and begin preparing supplies and equipment for intratheater lift. However, the air missions assigned to intratheater lift squadrons did not match the brigade combat team's needs. As a result, the LTF had to coordinate with U.S. Army Central Command (ARCENT), which then coordinated with U.S. Central Command Air Forces (CENTAF) to adjust the air missions. This problem was not a "war stopper," but it made the logistics pipeline difficult to control and strained limited resources.

> The commander who fails to provide his army with necessary food and other supplies is making arrangements for his own defeat, even with no enemy present.
>
> —Emperor Maurice
> *The Strategikon*, AD 600

During Operation Enduring Freedom, strategic logistics operated according to doctrine. All supplies flowed to the theater logistics hubs and from there into theater. If these hubs were located within the theater and had a deployed theater support command, C2 came from the theater support command. This led the logistics operators across the theater to conduct many video teleconferences to discuss priorities, ensure each unit's capabilities were known, and fill logistics shortfalls.

Approximately 5 months into the operation, the XVIII Airborne Corps from Fort Bragg, North Carolina, entered the theater and the 1st Corps Support Command became the lead management agency for

CONUS = Continental United States
LOC = Lines of communication

logistics. C2 was not consolidated, however, and the southern theater logistics hub still reported to ARCENT for C2. This hub remained a theater asset because it supported operations other than Operation Enduring Freedom. ARCENT was responsible for supply management, and CENTAF controlled intratheater airlift. Thus, additional coordination between the two commands was required.

A Solution

Joint theater distribution doctrine should be adapted to apply to intratheater, or operational-level, distribution. A joint distribution C2 element should control distribution when a theater support command is not present.

The Army must ensure that current doctrine is understood before it is changed or adapted. The Joint Publication 4–0 series, Logistics, can be used as a basis for establishing procedures. These documents focus on the macro level and do not prescribe exactly how to conduct joint logistics within the theater. However, they do provide a frame of reference for formulating concepts based on strategic doctrine.

It is easy to see the overlap of strategic, operational, and tactical logistics in the diagram of the current logistics concept above. Note in the diagram that strategic logistics stops at the theater base or port of debarkation.

Operational Distribution

The fundamentals of theater distribution are centralized management; an optimized distribution system; velocity over mass; maximized throughput; reduced customer wait time; minimum essential stocks; continuous, seamless, two-way flow of resources; and time-definite delivery. These fundamentals will become imperatives as the Army transforms from an Army of Excellence force to units of action and units of employment. [Units of action are the tactical echelons of the Future Force, comprising brigade and below units. Units of employment are Future Force units that perform division- and higher headquarters-level tasks.] These forces are being developed on the premise that they will be supported through distribution-based logistics.

The requirement to minimize the logistics footprint also must be considered in order to conserve strategic resources and give the National Command Authorities the flexibility to conduct simultaneous operations throughout the world. To meet these Transformation and minimal logistics footprint goals successfully, the Army must combine logistics efforts at the operational level as has been done at the theater level.

Distribution in theater from the port of debarkation to the operational area—operational distribution—is the responsibility of the combatant commander. If the combatant commander does not have a single logistics commander to assume this responsibility, he can use his air component commander to control intratheater airlift and assign the responsibility for the ground lines of communication to his land component commander. Each service component commander is responsible for providing his own logistics structure to support his forces. To minimize the logistics footprint, this must change.

Joint Distribution C2 Element

Centralized management, optimization of the distribution system, and maximized throughput are the key requirements for achieving operational distribution. A joint distribution C2 element can manage distribution effectively if it follows a strong document describing tactics, techniques, and procedures.

Centralized distribution management is the integrated, end-to-end visibility, capacity, and control of the distribution system and the flow of the distribution pipeline. The most important element is control. Control should start at the port of debarkation and continue to the direct support supply unit. The appropriate mode operators are needed to achieve control. All services within the theater should be represented in the joint distribution C2 element to collect information on requirements to ensure that it effectively meets distribution needs.

The centralized distribution management organization should not become an additional level of command in a theater of operations; it should be used in lieu of, or in conjunction with, either corps- or theater-level logistics units. The distribution commander must be given the resources to maintain in-transit visibility from the port of debarkation forward to the end of his network. This information must be shared with the supported commanders and the strategic network. As future common operating picture systems are developed, the different levels of the distribution system must be able to feed information up until it reaches the centralized management organization at the highest level. Lower levels need to be able to view one level up in order to forecast their needs, plan, and react accordingly. Having centralized management should aid in the distribution of information as well as the distribution of the supplies.

Another driving force for centralized management is the need to optimize the distribution system. As the services move to reduce their logistics footprint, they should try to piggyback their capabilities to get the most value with their logistics dollars. This is easy for common-user items such as food and water, and it should be no different for service-specific items.

The joint distribution C2 element will not be a warehouse and will not maintain stocks; its purpose will be to move supplies through the pipeline. It should have the ability to hold supplies in the pipeline and push them forward when needed. However, this is not a supply function; it is a prioritization function.

Airlift units and transportation units already carry cargo for all of the services. The military should maximize its transportation assets as they move forward within the theater. A single transportation manager could do this by configuring loads based on priority, location, and other factors.

Maximizing throughput—a concept the Army has been using for ammunition—could work for all of the services throughout the battlefield. The limiting factors are vehicles and aircraft. Minimizing theater-level logistics and maximizing throughput would eliminate the need for current theater distribution structures. If the services combined distribution resources, more resources would be available to support throughput operations.

Logisticians must remember that supplies should be used to support the forces and not stored. Throughput has to be controlled centrally. With the move toward loads being configured in the continental United States and sent to the units of action, management of flatracks and containers will become paramount.

Centralized management, optimized distribution, and maximized throughput are important for the distribution flow and also will affect the deployment flow. Economy of force will reduce strategic lift requirements and ensure that distribution logistics will have the lift it needs to become a reality.

Common Operating Picture

As information systems improve, a distribution-based logistics system will become easier to manage. The key enablers will be the services' common operating picture systems, which will include logistics modules. To make units of action a reality, the focus must be on logistics now more than ever. Having common operating pictures in the minimum number of systems will allow easier management with lower staff overhead. In-transit visibility technology must be a part of this to ensure that the supplies in the pipeline have the same visibility as a direct support unit's ASL. In distribution-based logistics, the pipeline will be just as important as the warehouse.

Risks Involved

Combining the distribution efforts of the services will have risks. The focus must be on joint distribution, not joint logistics. The culture of each service must be respected. Logisticians will need additional training to ensure they understand the support concepts of all of the services and how they are interrelated.

It will be difficult for services to give up control of their resources and assets. Giving up resources leads to a feeling of vulnerability, which is similar to the reason units want to maintain their own stocks.

The risks can be offset through education and professional development. As distribution-based logistics becomes more acceptable in the services, it will become easier for the services to work together.

Joint distribution operations will become a necessity in future operations and future doctrine. A joint distribution C2 element that has the power to meet the imperatives of centralized management, optimized distribution, and maximized throughput must be established. The tenets of distribution visibility, capacity, and control must be instilled in this organization. Using education, future common operating picture systems, and developed tactics, techniques, and procedures, combatant commanders will be able to task-organize an effective intratheater distribution system.

ALOG

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Medical Logistics During Operation Iraqi Freedom

BY CAPTAIN EDWIN H. RODRIGUEZ

On 17 February 2003, the 101st Airborne Division (Air Assault) at Fort Campbell, Kentucky, embarked on another "rendezvous with destiny"—this time to participate in what would become Operation Iraqi Freedom. In preparing for deployment to Iraq, the Division Medical Operations Center's Medical Materiel Section and the Installation Medical Supply Activity planned, forecast, and distributed medical supplies and equipment. The Army Medical Materiel Agency (USAMMA) played a role in meeting unit requirements by fielding upgraded equipment. Different initiatives, such as contingency sets, unit-deployment packages, and unit readiness surveys, also contributed to the unit's combat readiness. By the end of January 2003, the division medical units had a 97-percent fill on all of their sets, kits, and outfits.

Battle Preparation

The 101st Airborne Division sent an advance party to Kuwait to establish a key theater logistics node before its ground forces deployed. The advance party's highest priority was to establish medical supply operations. When the advance party arrived, medical logistics assets already in theater consisted of only two medical logistics activities—a medical warehouse in Qatar, and the 561st Medical Logistics Company at Camp Arifjan, Kuwait—and a medical warehouse that was part of the clinic at Camp Doha, Kuwait. Transportation and accessibility to immediate sick-call supplies were virtually nonexistent.

The advance party designed a medical logistics synchronization matrix that included a breakdown of all the medical resupply sets needed for reception, staging, onward movement, and integration (RSO&I); combat operations; and blood resupply. The 424th Medical Logistics Battalion arrived 10 days before the start of combat operations. After combat began, the 561st Medical Logistics Company was to go forward to Logistics Support Area Bushmaster in Iraq to support the 3d Infantry Division (Mechanized) and the 101st Airborne Division.

One major problem was the arrival of combat troops before the division's medical equipment. The medical equipment sets and the Division Medical Supply Office (DMSO) ASL were still weeks out when the troops arrived. This created a dilemma for supplying critical and sick-call medications to the troops. The modes of transportation used to move supplies and equipment were inadequate; for instance, buses were used to distribute sick-call supplies to all of the camps. Faulty communication systems made coordinating resupply difficult; units had to rely on local cell phones to communicate around Kuwait. Connectivity and automation reliability were dreadful. No assistance teams were available to service the Combat Automated Support Server-Medical (CASS–M) or Theater Army Medical Management Information System (TAMMIS) Customer Assistance Module (TCAM). It took the DMSO 15 days to get these systems operational.

In effect, the medical units arriving in theater were not combat ready. Even after the offensive operations ended, the 591st Medical Logistics Company struggled to meet customer demands when it first arrived in theater because it did not have authorized stockage list (ASL) supplies and was short of personnel and equipment. The complete ASL did not arrive at the area of operations for 30 days.

The 101st Airborne Division's medical units deployed with 20 days of supplies. During RSO&I and combat operations, combinations of line requisitions and push packages were used to augment the division's supplies. Initially, 30 units of blood were issued to each forward surgical team, 20 to each forward support medical company, 15 to each main support medical company, and 20 to the DMSO.

DMSO Operations During Combat

Once the medical equipment and supplies were available, the 101st medical units were ready for battle. To better support the troops forward, the DMSO conducted split operations. The forward DMSO was composed of four soldiers and was equipped with an ISU96 [a portable refrigerator that can be brought in by airlift or slingload] and 10 days' worth of supplies. The rear DMSO operated out of the division LOGPAD at Camp Pennsylvania, Kuwait, with 20 days of supplies. [A LOGPAD is a staging area used to temporarily house all classes of supply awaiting forward distribution.] Splitting DMSO operations increased logistics capabilities and resulted in the speedy distribution of medical supplies.

Having the rear DMSO operate from the LOGPAD during combat operations had its advantages. The health service materiel officer (HSMO) created a medical logistics synchronization matrix that included projected class VIII pushes, drop-off locations, and date-time groups. The HSMO provided movement requirements 72 hours out in order to fit its shipments into the scheme of priorities set for moving other classes of supply to the front line. The 101st DMSO was the only medical supply support activity in theater capable of ordering through the CASS–M throughout the operation. It also used medical resupply set components to replenish open requisitions.

The distribution of blood in theater was adequate. The only problem was its short shelf life, which was approximately a week and a half. The storage dates of blood and blood products were expiring constantly, which increased the use of medical evacuation helicopters to maintain blood supplies. In addition, the refrigeration capability was unreliable. Heavy-duty commercial refrigeration units were not available, so hundreds of units of blood were lost because they could not be kept cold enough. The 50th Air Ambulance Company helped distribute medical supplies, blood, and medical equipment, and the Division Medical Operations Center used division transportation assets to deliver class VIII supplies.

The DMSO received 5,000 cubic meters of supplies during combat operations. By the end of the conflict, the 101st Airborne Division medical logistics community had issued 200,000 items worth $1.2 million, pushed 73 pallets to each brigade combat team, issued 765 units of blood, and pushed 91 critical medical equipment sets to the division.

Changing Mission

When the 101st Airborne Division arrived in the city of Mosul in May 2003, it was 622 miles from its source of supply. Transportation and distribution once again became concerns for the combat service support community. The Division Medical Operations Center led the way in coordinating class VIII airlifts and commercial courier flights to Mosul Airfield.

A United Nations C–130 transport delivers class VIII humanitarian assistance supplies to Mosul Airfield, Iraq.

One of the great rewards of Iraqi Freedom was providing humanitarian assistance. Initially, the 101st Airborne Division provided security, restored power, and provided fuel. The Division Surgeon's Office, in collaboration with the 62d Medical Brigade from Fort Lewis, Washington, conducted an aggressive campaign to restore hospitals in northern Iraq. Hundreds of thousands of dollars from both U.S. and Iraqi sources were obligated for restoring hospitals, distributing medical supplies, and replacing biomedical equipment. The 561st Medical Logistics Company served as the distribution hub for all humanitarian supplies received from out of country.

Prolonged Stay

The unexpected decision to extend the division's time in Iraq led to more problems. The theater medical logistics system was not prepared to support such an extension. Prescription medications provided one of DMSO's major challenges. The division had to order chronic medications from its home station to meet the demand. After the Combined Joint Task Force 7 Surgeon's Office provided guidance on ordering and distributing maintenance prescriptions, the DMSO increased the ASL by 30 lines to incorporate the chronic medications most in demand.

Medical maintenance continued to be a serious problem, mainly because of constant wear and tear on medical equipment. Because it took 30 to 90 days to receive a part ordered through the system, DMSO decided to order parts directly from manufacturers and local vendors. It created an itemized list of all potential repair parts by piece of equipment. This ensured a constant stock of parts and cut down on the turnaround time of maintenance services. The biomedical shop at the DMSO also started incorporating the repair parts into its prescribed load list.

The contributions and ingenuity of the 101st Airborne Division medical logisticians during Operation Iraqi Freedom brought a new meaning to medical logistics, making a lasting difference in the way they support our troops now and in future operations.

ALOG

Captain Edwin H. Rodriguez is the Health Service Materiel Officer for the 101st Airborne Division (Air Assault). He has a bachelor's degree in biology from Inter American University of Puerto Rico and a master's degree in health service management from Webster University in Missouri. He is a graduate of the Army Medical Department Officer Basic Course and the Medical Logistics Management Course.

Hospital Logistics Support for Operation Iraqi Freedom

BY LIEUTENANT COLONEL TIMOTHY E. BATEMAN AND MAJOR SONG H. GOTIANGCO

Daily logistics support in an Army hospital is a "behind-the-scenes" operation. If all goes well, no one notices. Hospital activity revolves around patients, compliance with standards prescribed by the Joint Commission on Accreditation of Healthcare Organizations, and a plethora of interstaff committees.

The Landstuhl Regional Medical Center (LRMC) in Germany, with a staff of 2,000 Department of the Army civilians and military and contractor personnel, is the largest U.S. military medical facility outside of the United States. It is a joint operation, although not designated as such. Personnel from the Air Force's 86th Medical Squadron and the 212th Mobile Army Surgical Hospital (MASH) hold some of the key command and staff positions.

Although the performance of LRMC's mission, "To serve as America's beacon of healthcare for its sons and daughters abroad," has been strained the last several years by conflict, the center continues to be a solid bulwark for Army medicine. Between October 2001 and October 2002, more than 1,000 casualties from Operation Enduring Freedom (OEF) were treated at LRMC. This story was documented in the October–December 2002 *U.S. Army Medical Department Journal*. However, the staff barely had a chance to read it because, at the time, it was conducting a military decisionmaking process in preparation for a larger mission—supporting Operation Iraqi Freedom (OIF).

It became apparent early during the military decisionmaking process that the 212th MASH, several surgical teams, and many LRMC Army and Air Force personnel would have to deploy to support OIF. To support the casualty projections for OIF, the 160-bed LRMC would need 150 more beds, supporting medical equipment and supplies, backfill for the deployed personnel, and augmentees.

The Air Force subsequently deployed a 150-bed unit type code (UTC) hospital to LRMC. Army and Air Force backfill personnel, along with the 94th General Hospital (Augmentee Force), began arriving in February 2003.

Mission Preparation

The entrance point for all patients at LRMC is the Deployed Warrior Medical Management Center (DWMMC), an innovative and highly successful tool that transitions patients from the aeromedical evacuation process into the LRMC patient process. The DWMMC was manned to support OEF with internal LRMC assets. However, it was severely understaffed to support both OEF and OIF patients.

During the military decisionmaking process, the LRMC's Department of Nursing identified tasks that had to be completed before a large patient increase could be accommodated. The Logistics Division organized the tasks and presented proposed logistics missions to the hospital Chief of Staff for approval. Those logistics missions were—

- Conduct all previously assigned peacetime table of distribution and allowances (TDA) functions.
- With additional personnel, support expanded TDA functions for an increased patient population for an indefinite time by purchasing both medical and nonmedical equipment and supplies to support contingency operations; relocating hospital services and staff; integrating the Air Force UTC hospital and follow-on Department of Defense hospital support package into the LRMC; providing support to the DWMMC and additional staff; and preparing to combine selected TDA functions so all tasks and missions can be performed without the additional personnel.

LRMC Logistics Division Organization

Unlike most other Army medical centers, LRMC's Logistics Division is made up mostly of military personnel rather than civilians. The division has a headquarters section and five primary branches. The Medical Material Branch provides medical and nonmedical materiel using the Defense Logistics Agency and private vendors to purchase stock. The Environmental Services Branch provides housekeeping, linen, transportation, and hazardous material management services. The Facility Management Branch provides buildings and grounds maintenance and manages construction projects, utilities, and project design. The

A soldier injured in Iraq arrives at Landstuhl Regional Medical Center for treatment.

Equipment Management Branch provides life-cycle management of equipment, property accountability, clinical engineer management, and medical equipment maintenance.

The Logistics Readiness Branch develops and coordinates logistics support plans and manages staff assistance visits and inspections. This branch is the force that binds the other branches and the hospital in contingency operations. As such, it developed, coordinated, and tracked all logistics contingency requirements for LRMC in conjunction with the OIF military decisionmaking process. This allowed the chief of the Logistics Division to plan how to integrate those contingency missions into the division's core TDA missions.

Requirements Phase

During the military decisionmaking process, the Logistics Readiness Branch received requirements for over $2 million worth of equipment. Other logistics requirements were identified for new working space, housekeeping services, linens, medical materiel, transportation, and relocation services. The requirements were based on a limited budget and a low casualty figure. No additional staff arrived at LRMC during the military decisionmaking process, so the staff worked hundreds of overtime hours conducting product research, preparing statements of work, and completing purchase requests and commitments.

Relocation Phase

When the 150-bed Air Force UTC hospital arrived, the Logistics Readiness Branch assembled it, inspected all equipment and supplies, and carefully repacked it for relocation at LRMC. At about the same time, 22 office and storage trailer units and 4 shower and latrine trailer units arrived. After electrical, communications, and plumbing lines were installed, the relocation phase began in earnest.

Several clinical and clinical support services were combined or relocated—some within the hospital itself and some outside of the hospital. One clinic was relocated to the Ramstein Air Base medical treatment facility. Many contracted vendors came in on weekends, when the clinics were closed, to relocate the clinics and clinic support services. Because navigating the many halls of LRMC can be confusing, additional internal and external signs were posted to help direct patients and staff. As former clinics and offices became patient-care areas, housekeeping and facilities support services personnel were called in to make sure these areas met Joint Commission on Accreditation of Healthcare Organizations standards.

Expansion Phase

The order to execute the expansion phase was complicated because it involved both the Army Medical Command and the U.S. European Command, and it was critical to complete the expansion before the patient population overwhelmed existing beds and support. The key for this phase was the arrival of augmentees from the 94th General Hospital, backfill personnel for the 212th MASH, and personnel to operate the Air Force UTC hospital.

The LRMC Troop Commander assumed responsibility for finding barracks space for nearly 800 arriving soldiers and airmen. This turned out to be one of the largest logistics challenges LRMC faced. To accommodate everyone, two-man barracks rooms were converted to four-man rooms, and four-man rooms were transformed into eight-man rooms. The post hotel was converted to barracks rooms, and the barracks usually used by LRMC units that had been deployed elsewhere were taken over by arriving personnel. Finally, several post family housing units were converted to barracks. The barracks bed shortage was met until deployed units returned, when it again became acute. Permanent-party noncommissioned officers were given nonavailability statements and moved into housing in local communities. Scheduled renovations of barracks on other posts nearby were delayed so soldiers could move back into them.

The 800-person temporary force required additional dining facility support, transportation to the main posts, and other logistics support that was so important to troop morale. While the Troop Command struggled to meet these requirements, the Logistics Division moved the Air Force UTC hospital to LRMC. Then, over a period of several days, the Department of Nursing staff moved equipment and supplies into the various wards. Once the move was completed, the medical staff began training the equipment operators and the logistics staff conducted detailed equipment maintenance training.

Medical supplies were inventoried and added to computerized reorder lists. Highly sophisticated new equipment, such as a computerized tomography (CT) unit, required complex installation and technical inspections. As tons of medical supplies arrived, the Medical Material Branch developed push packages for the operating room, surgical clinics, and wards. The Property Management Section maintained accountability of the Air Force UTC hospital and the hundreds of pieces of new automatic data processing equipment and medical and nonmedical equipment arriving monthly. Several new staff elements were created, such as the Family Assistance Center, so the Logistics Division purchased and set up additional furniture packages to support them.

Patient Support Phase

Although patient support had been ongoing at LRMC since OEF, it began in earnest in April 2003, shortly after the combat phase of OIF started. The hospital received approximately 24 patients a day, most with combat-related injuries.

The theater aeromedical evacuation policy helped keep the workload in the Department of Nursing manageable. Patients identified for evacuation to the United States received life-sustaining care, were stabilized, and were evacuated within 3 to 5 days. The length of stay for other patients was longer, usually between 8 and 12 days. Before evacuating patients to the United States, every attempt was made to provide quality medical treatment that would enable them to recover and return to their units or elsewhere in the OIF theater as replacements.

During combat operations, the press, Members of Congress, general officers from all services, and patients' family members began flooding the LRMC. This created new logistics and administrative problems for the LRMC command and staff. The public affairs staff managed the press. The command group and the entire Kaiserslautern military community welcomed Members of Congress, and the medical and nursing staffs assisted general officers who were there to visit patients. LRMC's Family Assistance Center and the two local Fisher Houses (comfort homes built by the Fisher House Foundation, Inc., and given as gifts to the military services and the Department of Veterans Affairs) took care of visiting family members.

For the next month, the words "and evacuated to a military hospital in Germany for medical treatment" were standard language in most national and international news broadcasts. A learning center on post was converted to a press control center. This building was selected because it was near the hospital and had several rooms with required utilities and communications equipment and a parking area large enough to accommodate media vans.

During the early phases of OIF, LRMC received thousands of donated clothing articles, both used and new, including underwear, coats, shorts, tennis shoes, socks, pajamas, and robes. The LRMC chaplain's office became the receiving and distribution point for clothing and toilet articles. The volunteer staff of the chaplain's office set up a mini department store to distribute the free clothes and toiletries.

Patients routinely arrived on litters wearing some form of military pajamas and had no other clothes with them. Although most women could wear medium-size clothes, some of the big, muscular marines needed an extra-large size in everything. Fortunately, the Marine Corps liaison staff at LRMC had access to Marine Corps physical fitness uniforms.

Patients did not have access to televisions in the contingency wards, so many local and U.S. vendors, private organizations, and individuals donated televisions and stands.

During the requirements phase, LRMC had limited funding, so the primary emphasis was on obtaining essential medical equipment, supplies, beds, and expansion buildings. When the war began, LRMC was given unlimited funding, which was carefully managed in a way that would survive the scrutiny of any future audit. This funding allowed LRMC to buy patient comfort items and support the bulging staff.

As the patient load increased exponentially each month, it became apparent that the expansion was going to be a long-term operation, so the requirements phase was repeated with unlimited constraints. The average monthly operating bill was over $300,000, so millions of dollars would be needed to support LRMC's personnel and equipment.

Medical materiel purchases became increasingly difficult during May. The supporting contracting agency could not keep up because it still was staffed at peacetime levels. Blanket purchase agreements with vendors were developed to lower the number of purchase requests being processed. The Medical Material Branch's local procurement office, in conjunction with the Europe Regional Medical Command Contracting Cell, located many European vendors of U.S. medical products, which significantly reduced shipping time. However, the huge volume of medical materiel requirements continued to be a major problem for the procurement system.

Beginning in June, the outpatient clinics began to show stress from the sustained workload increase. Most clinics were not staffed or prepared to accept a huge workload increase. Because the population at risk had quickly changed from active-duty personnel to Reserve-component personnel, who sometimes were not as fit, unforecasted requirements, such as cardiology supplies, placed a heavy demand on the medical materiel supply system.

Seriously injured and extremely ill patients arrived with various items of medical equipment attached to their bodies. The Patient Movement Item (PMI) system is well prepared and works well during peacetime operations. ("PMI" refers to the medical equipment and supplies needed to support patients during evacuation.) However, patients from OIF soon overloaded the PMI system. In theory, PMI from an Army combat support hospital was to be swapped at the departing airfield in the OIF theater by the Air Force. However, Army and Air Force PMIs often are identical and sometimes were identified incorrectly while patients were loaded into and unloaded from aircraft or vehicles. As a result, Army PMIs sometimes were still with patients when they arrived at LRMC and LRMC PMIs sometimes were evacuated back to the United States with patients. Unfortunately, the Army's system for tracking PMI equipment is not as efficient as the Air Force's.

In June, LRMC received approximately 50 new patients a day and the total number of patients averaged around 200, which was more than twice the average daily patient population before the war. Because the DWMMC was severely understaffed, the logistics section supporting it assumed responsibility for controlling and storing baggage and sensitive items, issuing uniforms, and providing linens, housekeeping, transportation, and office supplies.

Baggage and sensitive item control quickly became a manpower and storage problem. Many patients arrived on litters and were sent directly to the intensive care unit. Their bags and personal items were moved from the patient bus to the baggage storage area, often without identification tags. Some patients arrived with issued or personal knives, while others arrived with their issued nuclear, biological, and chemical supplies. Many patients arrived with only a few personal items in trash bags, and others arrived with several duffle bags full of clothing and individual equipment.

Hundreds of items arrived daily, so the logistics personnel established a simple but effective tag system and recorded the items manually in a register. As patients were evacuated from LRMC, a second problem developed: Patient bags were not always sent with the patient. To correct this problem, personal items of patients leaving LRMC now are mailed at a rate of 50 pounds a day back to the patients' last known continental United States military unit.

Finding bed space for the flood of patients overwhelmed the LRMC's resources. The 415th Base Support Battalion was instrumental in providing temporary barracks for patient use. But these barracks were at Kleber Kasserne, 20 miles away. Buses were contracted to shuttle patients from Kleber Kasserne to the hospital and to the post exchange and other life support activities in Vogelweh. This was a long bus ride, and the bus ran all too infrequently, but it was better than paying $40 for a taxi ride. As the patient population continued to expand, two-person rooms became four-person rooms. The growing patient population created a huge drain on linen and housekeeping support.

Now, months later, the number of patients arriving at LRMC from OIF is even higher. Obtaining staffing to keep up with increasing patient loads is difficult. However, the logistics support personnel at LRMC will continue to meet new challenges by putting new systems in place to minimize patient difficulties and improve current systems so the logistics support provided is seamless and invisible to staff and patients. **ALOG**

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Class VIII Push Packages: What You Really Need to Know

BY CAPTAIN BRANDON M. BOWLINE

It is 0200 and you, as the Charlie Medical Company Commander, are huddled in your command post with your evacuation platoon leader going over the brigade combat team's combat health support plan for an upcoming mission. You have gone with minimal sleep over the past 96 hours and would like nothing more than to wrap up this meeting and grab a few hours of sleep before you attend the rehearsal in the morning. Suddenly, an evacuation crew that supports one of the battalion aid stations comes running in saying that their aid station has no fluids or IV starter kits and is almost out of bandages, cravats, abdominal dressings, and gauze! Your night just got longer.

This scenario could cause a lot of unneeded stress and anguish. However, there is a simple solution to this problem if you plan and resource appropriately. Class VIII (medical materiel) resupply can be as easy or as difficult as you make it. If you are the forward support medical company commander, you are expected to work with the division medical supply officer (DMSO), the brigade combat health support officer (CHSO), medical platoon leaders, and medics across the brigade combat team to ensure that all units have the class VIII they need to stabilize patients for evacuation to the appropriate level of care. If you are the medical platoon leader for an infantry or armor battalion task force, you are expected to have what you need to treat patients. Do not count on anyone else to do it for you. Anytime class VIII is mentioned, everyone will look to you as "the medical guy who understands that stuff." Here is a way to help you successfully plan and execute class VIII operations at the brigade or battalion level.

Developing a Class VIII Resupply Plan

A successful class VIII resupply plan starts at the home station. Chapter 4 of Field Manual 4–02.1, Combat Health Logistics, discusses class VIII supply operations at the division level and below—

> The forward deployed medical platoons/BASs [battalion aid stations] of a division request their class VIII supply from their supporting FSMC [forward support medical company] located with the forward support battalion (FSB) in the BSA [brigade support area]. The FSMC's MEDLOG [medical logistics] element is the direct support unit (DSU) for all class VIII material for the brigade. This element maintains a small authorized stockage list (ASL) of medical supplies for the brigade. The medical sets, kits and outfits organic to the treatment, patient hold, and ambulance sections of the FSMC can be utilized as a backup source of supply for emergency resupply to the medical platoon/BAS. . . . Preconfigured anticipatory resupply packages are normally shipped . . . until replenishment line-item requisition is established with the supporting MEDLOG company. . . . While resupply by preconfigured anticipatory resupply packages is intended to provide support during the initial phases of an operation, continuation on an exception basis may be dictated by operational needs.

At the aid station and FSMC levels, requisitioning by line item is not always the solution, even after the supporting MEDLOG unit is established. For example, why order a trauma medical equipment set when all you really need is gauze, fluids, and dressings? At the brigade and battalion levels, a more efficient method is to develop "preconfigured anticipatory resupply packages," or push packages, as the primary means of class VIII resupply.

Developing Push Packages

The key players must be involved in the process of standardizing the contents of a push package. At a minimum, you should consider including the following people in the planning process—

- FSMC commander.
- Healthcare provider—a physician's assistant or surgeon—from each unit.
- Medical platoon leaders.
- Medical platoon sergeants.
- Treatment platoon leader.
- Treatment platoon sergeant.
- FSMC medical logistics noncommissioned officer in charge (NCOIC).

- DMSO medical logistics NCOIC.
- CHSO.
- Division medical operations center representative.

You also need operational information to assist in the standardization process. The brigade S–3 plans officer can provide key operational information.

Your initial meeting should clearly define the task, purpose, and desired end state. You want to keep things simple by designing small, functional, easily transportable push packages tailored to provide a specific kind of class VIII resupply. The contents of the push packages should be related directly to the type of mission the brigade and battalions will execute. For example, you don't want to include calamine lotion in a push package intended to treat trauma injuries sustained in a MOUT (military operations on urbanized terrain) environment. Here are some planning considerations.

Identify the type of operation. Very little guesswork is involved here. Talk with your S–3 if you do not already know what kind of operation you will be supporting. For example, your brigade may be deploying to conduct combat operations; the brigade initially will be in a defensive posture, but it is expected to transition to offensive operations.

Define the form of operation. You already have determined that the brigade will be conducting defensive and offensive operations. Now you need to know how the brigade will be conducting these operations. For example, if the brigade is conducting a defense, will it be an area defense, a mobile defense, or something else? Once the brigade transitions to offensive operations, what kind of offensive operations will it conduct—a movement to contact, an attack, a reconnaissance, or a security operation? Once you know the operational set, you can begin to work on the casualty estimate and make an informed decision about the types and quantities of push packages you will need.

Determine the operational conditions. You should include several key issues when considering the conditions in which you will be operating. Are you operating in a rural or urban area? What impact will the terrain—desert, mountains, or jungle—have on soldiers? How does the regional climate compare to home station? Are there high elevations? What are the medical rules of engagement? Are you expected to provide medical assistance to the local populace? Are there any customs that you must observe if you are working directly with the host nation? What nongovernmental organizations and international organizations are already providing medical assistance in country? What capabilities are available from the current medical infrastructure? What are the major health problems of the local populace? What industrial pollutants are present? Conducting a complete medical intelligence preparation of the battlefield will answer most, if not all, of these questions. Look at the flora, fauna, insects, rodents, and so forth that are in theater. For example, if poison oak and poison ivy are in theater or malaria is an endemic disease, then you may consider adding the appropriate chemoprophylactics to a push package. At a minimum, you can inform your unit of the medical threat and preventive measures.

Identify the nuclear, biological, and chemical (NBC) threat. What is the chemical officer's assessment of the NBC threat? Will you need to be prepared to establish patient decontamination sites?

Identify historical consumption data. If you are replacing a unit in theater, talk to the leaders immediately. They should be able to identify what works and what doesn't. If your unit has performed this mission before, review your unit's consumption data.

Determine the availability of class VIII in theater. What unit will provide your resupply? Is it a DMSO or a medical logistics battalion (-)? How do they operate? Who are the key players? How will you talk to them in theater? What services can they provide you as a customer? What is the turnaround time once you place an order? What kind of ordering system are they using? What kind of ordering system do they want to use with your unit? What class VIII items do they have a problem getting in theater?

This is not an all-encompassing list, but it is enough to get the thought process started. Based on the information you put together, you can better define the different types of push packages required for resupply operations. Keep it simple. A trauma push package will probably have the same class VIII for an attack in an urban environment as it would for an area defense. Look at structuring the push package to support the lowest level of stabilizing care, such as the battalion aid station. Examples of types of push packages

The contents of the push packages should be related directly to the type of mission the brigade and battalions will execute.

Doctrinally, the Army uses ambulance backhaul (air and ground) as the primary means of class VIII resupply.

include trauma, sterilized instrument, combat lifesaver, sick call (based on trends and medical threat), humanitarian, and line medic.

Most importantly, make sure your health care providers are heavily involved in developing the standardized push package contents. They, along with the medics, are the soldiers who eventually will use the supplies, not you.

Building and Delivering Push Packages

Once you have created a menu of push packages, you have other responsibilities to address.

Order class VIII and assemble push packages. You should clearly define the unit responsible for building the packages. You may want to have the supporting DMSO or medical logistics battalion order, receive, and build the push packages at its location. This provides a great advantage to the supported brigade, reducing man-hours spent by a significantly smaller MEDLOG section in the FSMC because the FSMC has fewer personnel than the DMSO medical logistics battalion.

Determine quantities of packages to be assembled. When deciding how many of each kind of push package to put together, look at some of the data that you already have. For example, your casualty estimate, coupled with historical data and trends, should provide an approximation of the number and type of patients that you can expect to see in any given operation. Do not attempt to pick numbers out of the sky or off the dartboard for this. The FSMC should always keep a few extra push packages on hand. More is always better, but you do not want to hinder mobility because you requested too many push packages.

Determine delivery and emergency resupply methods. If you decide that the medical logistics battalion will be the unit responsible for building the packages, delivery at the brigade-and-below level will be simple. Doctrinally, the Army uses ambulance backhaul (air and ground) as the primary means of class VIII resupply. For emergency requests, take advantage of the assets in your sector. Anything from a logistics package (LOGPAC) to a helicopter could be used for delivery. If you decide to use nonmedical assets for delivery, make sure you understand the standards prescribed in the Geneva Convention for transporting medical supplies.

Establish a delivery schedule. Base your delivery schedule on the times you anticipate the unit to start to run low on supplies. Using the green, amber, red, black (GARB) system, you can safely assume that a unit will go at least to an amber or red status toward the end of a mission. Whether you decide to pre-position before defense will be in place or use ambulance backhaul as the resupply method, make sure your plan is synchronized with the key players who can influence the logistics flow of the battle. At the brigade level, your plan should be synchronized with the brigade S–4 and forward support battalion support operations officer and integrated into their logistics synchronization matrix. At the battalion level, synchronize the delivery with the S–4 and the headquarters and headquarters company commander. Understand that you are not assigning responsibility but helping to maintain asset visibility in support of the brigade or battalion.

The technique discussed above can be used to standardize class VIII resupply operations at the brigade and battalion levels. If you are in a deployable unit, then your unit owns class VIII and you will need a resupply plan. You have a responsibility to ensure that soldiers—from the combat lifesaver to the forward support medical company medical personnel—have the medical supplies necessary to stabilize patients for evacuation to the level of care they need.

Do you remember the scenario at the beginning of the article? If you properly plan and resource class VIII push packages before deploying, the scenario could end as simply as this—

You send your command post runner to wake up the medical logistics NCO, who provides three emergency resupply push packages. Now the aid station will have enough critical medical supplies, so you can get some sleep before attending the rehearsal in the morning.

ALOG

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MTS Is Revolutionizing Logistics on the Move

BY KELLY M. TAPP

The Movement Tracking System allows the Army to track and communicate with individual vehicles on the battlefield.

The Army is undergoing a revolution that will provide the technology and systems needed to support U.S. soldiers around the world. Older databases and redundant systems are being replaced with cutting-edge technologies that help the Army do its job faster and more effectively. As part of this revolution, the Army is changing the way it transports and maintains equipment and personnel in an effort to improve its overall sustainability. It is increasing its efficiency by adopting improved business processes, and it is using technological advances to support operational concepts in a logistics revolution. One way the Army is adapting technology to transform its logistics systems is by developing and installing the Movement Tracking System (MTS).

MTS is a satellite-based tracking and communication system. Through military global positioning systems and two-way messaging, MTS provides worldwide coverage and positive control of movements. Because MTS is based on satellite communications, it does not depend on existing landlines, which makes it a more secure system that is less vulnerable to interruptions.

MTS gives users the ability to identify positions of MTS-equipped tactical vehicles, track their progress, and communicate with their operators. The use of MTS is creating a revolutionary level of visibility previously unknown to the Army's logistics community.

MTS Development

Innovations in technology have motivated the Army to find better ways to train, supply, and equip its soldiers. The revolution in communications technology in the 1980s and 1990s spurred the Army to improve its capabilities for tracking and communicating with soldiers in the field. Commercial technology was harnessed to suit the unique needs of the Army and develop a secure means of communicating with deployed units. MTS was the result.

The earliest model of MTS—a truck-to-truck messaging service—was tested in 1995 through the Army's Advanced Warfighting Experiments (AWEs). AWEs test and refine the requirements for the most promising advanced technologies to aid the warfighter. In this process, MTS proved to be a winner. The capabilities of MTS continued to grow as it incorporated messaging via the Internet in 1996. In 1999, MTS improved its messaging service by delivering messages over a secure satellite network independent of the Internet in less than 10 seconds. The advantage of faster messaging, of course, is that it enables soldiers to obtain the information they need when they need it.

Even as the messaging system was improving, MTS incorporated an in-vehicle map to show truck and group locations. Industry partners helped improve MTS by funding multisatellite access and data

An MTS computer system is mounted on the dashboard of a heavy, expanded-mobility, tactical truck (HEMTT) (above). The computer slides into a mounting station that is installed on the HEMTT's dashboard (below).

encryption capabilities and a single worldwide terminal. As the Army's testing cycle continued to demonstrate the need for in-vehicle tracking and communications, MTS continued to fill that need successfully.

Because of the success of MTS in AWEs, the Army Training and Doctrine Command approved the operational requirements for MTS in September 1998. Later that year, the Program Executive Office (PEO) for Standard Army Management Information Systems (now the PEO for Enterprise Information Systems) received program management responsibility for MTS. It thus became the PEO's job to standardize and field MTS. By 2000, MTS was ready to be put into operation Army-wide.

The first step toward Army-wide MTS operation was to conduct an operational test. The 180th Transportation Battalion, 13th Corps Support Command (COSCOM), at Fort Hood, Texas, was selected as the test unit. MTS passed the operational test in April 2000 and then was fielded to elements of the 4th Infantry Division (Mechanized) and the 13th COSCOM at Fort Hood that would be participating in Division Capstone Exercise I in early 2001 at the National Training Center at Fort Irwin, California. The performance of MTS exceeded expectations at that exercise.

MTS proved so effective that only minimal updates and improvements to its computer technology have been needed since then. However, this has not stopped efforts to update the system. As the Army moves toward its goal of achieving total asset visibility, efforts are underway to interface MTS with other systems in order to better coordinate combat mission support.

MTS Capabilities

MTS provides communications and tracking capabilities for all Army vehicles and for selected other combat service support assets—capabilities they need to complete and survive their missions on the battlefield. MTS directly impacts the efficiency and readiness of the warfighter by providing him with near-real-time data on the location and status of Army movements exactly when he needs them. The ability to initiate essential communications easily and quickly enables commanders to redirect battlefield movements, technicians to assist with on-the-spot repairs, and logistics support personnel to coordinate supply chains.

MTS improves the Army's communications capabilities on vehicles by using commercial communications satellites that have a messaging capability similar to email. The MTS messaging capability is similar to email systems in that it has a book of addresses for all MTS-equipped platforms in a group, but messages are limited to 100 characters. To protect key information about tactical locations from being widely accessible, the messages are encrypted and may be decrypted only by another MTS system.

MTS provides an "in-the-truck" compact computer screen that displays a rolling map designed to let operators know exactly where they are at all times. The MTS Program Management Office routinely obtains and updates maps from the National Geospatial-Intelligence Agency that are uploaded to MTS systems based on a unit's mission and expected areas of deployment.

On 23 March 2003, the 507th Ordnance Maintenance Company took a wrong turn in the Iraqi desert. Eleven soldiers died as a result of that mishap. The mission of the 507th was to keep the Army's heavy vehicles rolling forward and to support combat troops, not to find themselves in a combat situation. MTS would have provided the capability to track the movements of the 507th and quickly notify them when they veered in the wrong direction. Had their vehicles been equipped with MTS, it could have helped them to avoid the lethal encounter.

Effective logistics tracking not only helps protect soldiers through maps and navigational devices, it also helps leaders know where the tools are that the warfighters need to do their job. MTS tracks the machinery and supplies that are vital to ensuring the success of a mission and the warfighters' well-being.

Preparing for the Future

MTS will continue to transform the logistics community in the future as it adds the capability to interface with, or "talk to," important logistics Standard Army Management Information Systems such as the Global Combat Support System-Army (GCSS-Army) and the Transportation Coordinator's Automated Information for Movement System II (TC–AIMS II).

While it currently provides tracking and communications capabilities to MTS-equipped vehicles, in the future MTS will interface with GCSS-Army to support combat missions. GCSS-Army performs a series of combat service support functions, such as supply, property, maintenance, and management, as well as personnel, financial, medical, and other support functions. By interfacing MTS with GCSS-Army, the Army will increase its capabilities to complete and survive distribution missions on the digitized battlefield. One new capability will allow vehicle diagnostic information to be supplied to the maintenance management system. This will help keep vehicles running smoothly and shipments of needed parts moving forward quickly. Adding GCSS-Army capabilities to MTS also will allow for theater-wide situational awareness and asset visibility, which will provide the warfighter with information about what supplies are deployed and where they are.

MTS also will work with the TC–AIMS II program to coordinate the logistics of planning and sustaining missions. TC–AIMS II automates the planning, organization, coordination, and control of unit-related deployments, sustainment, day-to-day transportation operations, redeployments, and retrograde operations in support of the Defense Transportation System in both peacetime and wartime. By having an automated transportation planning and coordinating system (TC–AIMS II) linked to a tracking and communications system (MTS), the Army will gain unprecedented asset visibility of heavy equipment like tanks and Bradley fighting vehicles. Not only will there be increased total asset visibility, but users also will be able to identify what equipment is being moved to other locations. This increased visibility will give commanders a clear view of both what is deployed and what is en route, helping them to plan missions and assess mission requirements more accurately.

The white pyramidal structure on the roof of this high-mobility, multipurpose, wheeled vehicle (HMMWV) is the satellite communications device on which MTS depends for receiving and transmitting data.

Other plans for MTS improvements include interfacing MTS with radio frequency identification (RFID). RFID achieves in-transit visibility by letting users receive accurate reports of the location of supplies at all stages of their movement. An RFID network can track the transportation of supplies such as ammunition, baggage, and medical equipment from Army depots to regional distribution centers and then to Army installations in Europe and other theaters. MTS is scheduled to have an RFID interface ready for Army-wide production in the spring of 2004. By improving overall logistics visibility, these systems are improving situational awareness, keeping leaders accurately informed, and supplying the warfighters with the tools they need.

MTS has been installed and is running on over 2,000 vehicles in Kuwait and Iraq, thereby contributing to the success of the mission and the safety of the warfighters in Operation Iraqi Freedom. Systems continue to be installed on vehicles in the Middle East by MTS teams working out of the main support site in Arifjan, Kuwait, and a forward support site in Iraq.

MTS currently is installed on approximately 3,700 Army vehicles supporting missions around the world. MTS could be installed on as many as 41,000 Army vehicles; however, installation is funded at this time for only 32 percent of those vehicles.

Despite budgetary limitations, MTS is continuing to develop new methods to better support the missions of the Army. By working toward interfacing with GCSS-Army, TC–AIMS II, and RFID, MTS will provide the Army with unprecedented communications and tracking capabilities for deployed and in-transit units and supplies. With these improvements, MTS will be able to track heavy equipment and supplies from the factory to the field and provide soldiers with real-time data on the tools they need to do their jobs.

Timely and complete information on the battlefield is integral to the warfighter’s ability to successfully accomplish his mission. The ability to track supplies will enable soldiers to get what they need when they need it without having to sort through dozens of containers. Improved situational awareness will prevent future tragedies like the one experienced by the 507th Ordnance Maintenance Company. Revolutionizing Army logistics with systems like MTS is a crucial step toward providing the technology and systems needed to support U.S. soldiers around the world. **ALOG**

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Understanding Intermediate-Level Education

By now, most Army officers know that the term "Intermediate-Level Education" (ILE) refers to the third tier of the Officer Education System and is linked directly to Army Transformation. Under ILE, officers will attend schooling and subsequently receive assignments based on the needs of their respective career field, branch, and functional area. ILE will increase the quality of educational opportunities available to majors and better prepare them for their next 10 years of Army service, enhance the Army's capability to conduct full-spectrum operations, "re-green" all officers on Army warfighting doctrine, and provide lifelong learning opportunities aimed at developing self-aware and adaptive officers.

ILE includes completion of the common-core curriculum and the required career field, branch, and functional area training and education. According to its mission statement, ILE will prepare "field grade officers with a warrior ethos and warfighting focus for leadership in Army, joint, multinational, and interagency organizations executing full spectrum operations."

That's quite a mouthful, but what does it mean to commanders and field-grade officers? What is ILE really about, and how does it differ from the old, or *legacy*, Command and General Staff Officer Course (CGSOC) conducted by the Army Command and General Staff College (CGSC) at Fort Leavenworth, Kansas?

Pilots for ILE began in fiscal year 2002, and full implementation is projected for fiscal year 2005. Three linked areas inexorably distinguish ILE, or the *new* CGSOC, from the legacy course: student population, curriculum, and instructional method.

Student Population

The primary difference between ILE and the legacy CGSOC is that the Army is committed to providing the best possible intermediate-level education to *all* majors.

For the legacy course, the Army used a central selection process to select the top 50 percent of the majors in each year group. These majors then attended the 10-month resident course at Fort Leavenworth. The rest completed a nonresident education program to receive their field-grade education and thereby become competitive for promotion to lieutenant colonel.

Under this system, half the Army's majors did not get an opportunity to attend a resident program to develop their technical, tactical, and leadership competencies and skills. Majors in the Information Operations, Institutional Support, and Operational Support career fields, along with special branch majors who only needed the common-core portion of the course for Military Education Level IV and joint professional military education I, chose CGSOC professional development electives for the remainder of the 10 months.

In the ILE program, all majors in the Operations career field will attend the 10-month resident course at CGSC—a 3-month common-core course followed by a 7-month Advanced Operations and Warfighting Course (AOWC). The goal of the education is to improve the officers' abilities to conduct full-spectrum operations in joint, interagency, and multinational environments and develop the competencies required to serve successfully as staff officers at division level and above.

Majors in the Information Operations, Institutional Support, and Operational Support career fields and special branch majors also will receive a resident ILE common-core course at various locations. Teaching teams from Fort Leavenworth will take the instruction to locations near large populations of officers in career fields other than Operations. In fact, the Army has already piloted three iterations of the ILE common-core course using the course location concept and Fort Leavenworth instructors. These pilots provided the ILE core curriculum to over 165 officers at the Army Signal School at Fort Gordon, Georgia, and the Army Logistics Management College at Fort Lee, Virginia.

Most Reserve component majors will receive the ILE common-core course through The Army School System or an advanced distributed learning program that will replace the correspondence course. As the number of students attending the resident ILE common core course and the AOWC at Fort Leavenworth increases, so will the number of Reserve component majors attending those courses. This approach will give the students, their commanders, and the Army maximum flexibility while providing the best possible ILE to all majors.

Curriculum

A totally revamped curriculum is the second area that distinguishes ILE from the legacy CGSOC. The 3-month common-core ILE replaces Term I of the legacy CGSOC. It will prepare field-grade officers to serve on division, corps, echelons-above-corps, land component command, and joint staffs. Graduates will understand full-spectrum operations in today's environment, know how to think, understand complex problem-solving, be able to balance their focus between current and future operations, understand staff principles and concepts, know how to synchronize effects on the battlefield, and understand performance-oriented training and education.

The school's competency map, linked directly to the Officer Evaluation Report (OER), codifies the skill set students must demonstrate to graduate from the ILE program. While this is a new concept at CGSC, the Army has used this OER for nearly 6 years, so field-grade officers attending the ILE course probably have been exposed to this skill set many times before they arrive at CGSC.

The focus of this skill set is on educating students in *how* (versus *what*) to think, to solve problems, and to make decisions. Classroom time is devoted to the application level of learning. Students soon realize there are no "school solutions" to the problems they are presented. Instructors help them work through the problems and critique the link between identification of the problem and the students' solutions. As long as evolving doctrine is not violated and the basic principles of planning are demonstrated, the answers are accepted.

This concept is a tremendous step forward in developing field-grade officers who are capable of thinking rather than just memorizing answers. The 2001 Army Training and Leader Development Panel Officer Study identified the need for Army officers who are adaptable and capable of thinking in a fast-paced, constantly changing environment. This is the foundation of the ILE curriculum.

Four blocks of instruction comprise the ILE common-core course: Foundations of Critical Reasoning and Leader Assessment and Development, Strategic Fundamentals, Operational Fundamentals, and Tactical Fundamentals. Three parallel courses are integrated into the instruction: Leadership, History, and Force Management.

The 7-month AOWC replaces Terms II and III of the legacy CGSOC. Its curriculum is designed to develop Operations career field officers with a warfighting focus for battalion and brigade command and division through echelons-above-corps staff officer positions. Students will leave the AOWC with a deeper understanding of full-spectrum operations in the contemporary operating environment, including battlespace appreciation, component roles and responsibilities, decisive and enabling operations at the tactical level, asymmetric operations, and urban operations.

A series of exercises are used to evaluate the students' mastery of the concepts taught during both the common-core course and the AOWC. These exercises are conducted at the section level, so the students in each section do all of the planning and execution, as well as man the opposing forces and white cell for each exercise. The exercises place the students in a joint, combined, highly complex environment with numerous opportunities to identify problems and solve them. The advantage of this process is that, instead of waiting for one end-of-year exercise, students plan and execute multiple operations and receive feedback that helps them improve during the entire 10 months.

AOWC studies are divided into three blocks of instruction. Each block includes an application exercise, during which students must demonstrate mastery at the land component command, division, and brigade levels through competition between student groups. This competition gives the students an opportunity to study and perform in multiple command and staff roles and in threat force roles. The driving theme is enabling and executing division and brigade fights.

AOWC retains an elective program from the legacy course so the students can pursue additional focused studies.

Instructional Method

Team teaching is the third domain shift that distinguishes ILE from the legacy CGSOC. It is through team teaching that CGSC will achieve its goal—graduates with a warrior ethos who are grounded in warfighting doctrine and who have the technical, tactical, and leadership competencies and skills to be successful in their career field, branch, or functional area.

Each teaching team is made up of experts in joint and combined operations, tactics, leadership, history, and logistics. The team is responsible for providing all instruction to its section throughout the academic year and for exercising oversight during the major exercises at the end of the common-core portion of the ILE course and during each block of AOWC.

The team-teaching method is a major change from the small-group instruction method used in the legacy CGSOC. Members of the teaching teams coach seven or eight students each. They observe and mentor the students, provide them feedback, counsel them, and assist them with their professional and personal development. Students get to know the instructors, and, more importantly, the instructors get to know the students. Therefore, the instructors are better prepared to provide meaningful developmental counseling to the students.

There are approximately 1,152 students in the Fort Leavenworth ILE program this year. They are divided into 16 sections that are further broken down into student groups of 16 to 18 students. The size of student groups is tied directly to civilian studies that show that adult learning is best achieved in small groups of 12 to 16 students. Limiting the size of the student groups permits the best possible student learning and allows the instructor teams the opportunity to know and develop the students better.

ILE instructors believe the program is a significant step toward preparing majors to understand and solve problems in the highly complex operational environment they now face. Those asked believe that ILE-trained field-grade officers will be capable of thinking through the most difficult situations, adapting to changes in their operational environment, and ensuring the continued success and freedom of our Nation. **ALOG**

The staff of Army Logistician thanks Colonels, USA (Ret.), Neal Bralley, Jim Danley, Dan French, Chuck Soby, and Paul Tiberi, who are contract instructors supporting the Intermediate-Level Education program at the Army Command and General Staff College, for their contributions to this article.

Improving Visibility in the DOD Supply Chain

BY DANIEL W. ENGELS, PH.D.; ROBIN KOH; ELAINE M. LAI; AND EDMUND W. SCHUSTER

To ensure the readiness of the U.S. military to fight and win in any conflict, the Department of Defense (DOD) maintains an inventory of supplies and equipment valued at more than $80.5 billion. Managing this inventory is difficult because the various military services and organizations within DOD use different automated supply systems.

Joint Vision 2020, which guides the transformation of the Armed Forces begun in Joint Vision 2010, recognizes the increasingly important role of logistics in modern warfare. One of the operational concepts of Joint Vision 2020—Focused Logistics—is defined as—

> The ability to provide the joint force the right personnel, equipment, and supplies in the right place, at the right time, and in the right quantity, across the full range of military operations. This will be made possible through a real-time, web-based information system providing total asset visibility as part of a common relevant operational picture, effectively linking the operator and logistician across Services and support agencies.

In an effort to help the military reach its focused logistics goals, the Massachusetts Institute of Technology's Auto-ID Labs have developed, implemented, and tested a networked, physical-world electronic product code (EPC) system that enables the automatic identification (auto ID) and location of all objects in an inventory, thereby providing total asset visibility. Through individual item identification using the EPC, radio frequency identification (RFID) systems, and sophisticated data- and information-handling capabilities, auto-ID technology links physical objects to information accessible through the Internet or a secured Intranet. The EPC enables unique identification of every item, aggregation, and grouping and acts as a pointer to networked information about its associated object. With the Auto-ID Labs' EPC system, complete, real-time inventory visibility is possible.

The EPC system is being adopted as a standard in the commercial sector and could be applicable to the military as well. A military-commercial interface would allow all military suppliers to use the same standardized system to identify objects. Use of the EPC system would help improve the U.S. military's readiness for war by providing DOD with unprecedented visibility and control of the supply chain.

DOD Supply Chain

In many ways, the DOD supply chain is similar to the supply chains of commercial suppliers because many of the products and supplies contained within the DOD supply chain are also available commercially. However, differences in optimization criteria lead to a number of characteristics that set the DOD supply chain apart from the commercial supply chain. Some of the most important of these differentiating characteristics follow.

Readiness. The primary purpose of optimizing the military supply chain is to enhance readiness for war. Knowing the location and status of all materials needed to support operations is an essential component of readiness.

Long supply lines. War is an international activity, which means that lines of supply to support operations are long. Without auto-ID technology that provides real-time visibility of items moving from the suppliers to the front-line troops, it is extremely difficult to maintain accurate knowledge of supply-chain-wide inventories.

Variety of items. Military operations require a large number of items, ranging from everyday supplies to food and clothing to specialized equipment. Different categories of items have different standards for inventory accuracy and visibility.

Unstable demand. Military demand is often variable and unpredictable because conflicts can happen anywhere in the world at any time. When a conflict occurs, demand for supplies increases dramatically and existing stockpiles of materiel are depleted quickly. Accurate inventories are critical to maintaining readiness in the presence of variable demand.

Moving end points. The end, or destination, points of the military supply chain generally move forward with advancing troops and are either terminated or transformed, creating additional difficulties for transportation and inventory management.

Priority. The military supply chain operates on priorities set by unit commanders based on urgency of need.

Equipment reliability and maintenance. Military operations take place in all types of environments and on all kinds of terrain. Under battle conditions, it is important that all identification technologies work effectively and that system maintenance is minimal.

Detection. In a theater of operations, the military must always be careful not to divulge information about its position that would be advantageous to the enemy.

The problems that have resulted in the past from these characteristics of the DOD supply chain often were exacerbated by poor inventory visibility. The use of auto-ID systems that are customized to accommodate the peculiar aspects of the DOD supply chain can significantly reduce the recurrence of these problems.

Inventory Management

Recent analyses have found that faulty inventory records often result in miscalculated order quantities. In addition, shipping delays create uncertain transit times. Faced with poor supply chain visibility, military planners have no choice but to over-order in an attempt to compensate for uncertainty. This leads to invalid priorities, excess inventory, and bottlenecks in transportation. Accurate, real-time inventory management throughout the supply chain would improve visibility and reduce over-ordering.

Repair and Maintenance

Any large-scale repair operation is complex because it is difficult to predict demand for spare parts. In military repair operations, expensive parts are given high priority and customer wait time is usually very short. However, inexpensive parts are often critical to completing a repair. These parts are usually assigned a lower priority, which often causes them to be delayed in shipment. In turn, this causes delays in the entire repair cycle. Military planners often increase the total fleet size to compensate for lengthy repair times.

An RFID tag is attached to a pallet of sodas. Electromagnetic energy transmitted by a reader activates the integrated circuit on the tag. Once activated, the tag transmits a signal that, in turn, is received by the reader. (Photo courtesy of Auto-ID Labs.)

Readiness and Mobility

Combat forces must be ready to engage in a conflict, and they must be able to move to the conflict location quickly. Troop readiness is determined in part by equipment readiness, and equipment readiness hinges on proper repair and maintenance.

Mobility is determined primarily by the quantity of materiel that must be moved and the number of transport vehicles available to carry it. In general, the smaller the inventory required to travel with a force, the greater its mobility. Accurate data on inventory quantities and locations enables logistics support systems to transport a greater quantity of items, thereby reducing the inventory of forward-positioned troops while increasing their mobility.

Tracking

The lack of a single, standardized auto-ID system severely limits the tracking of assets as they move through the supply chain from the supplier to the troops. Similarly, the visibility of objects flowing back through the supply chain is limited. The inability to track individual items negatively affects all supply-chain-related applications, including repair and maintenance, identification of failure-prone parts, and the ability to perform predictive maintenance.

System Improvement

In response to recognized problems with asset visibility throughout the military services, DOD has made significant investments in research and development of RFID systems that will improve security, cargo visibility, hazardous materials (HAZMAT) recognition, product tracking, and quality control.

Security. Automatic Vehicle Identification (AVI) is a project to enhance security at access-control points. The Army has hired Transcore, Inc., to test access control at Fort Monmouth, New Jersey, using passive, ultra-high-frequency (UHF) "eGo" wireless RFID tags.

Testing of eGo tags began in November 2002 and is still in progress. Vehicles with proper security clearances are equipped with eGo tags on their windshields. As vehicles approach the entrance to the fort, they encounter a simple tilt-arm gate. An RFID reader scans the eGo tag, and the gate opens. The car then proceeds to a common access reader, where the driver is identified using established, non-RFID procedures.

Technology used for this test includes the thin eGo windshield tag and the eGo 2210 reader. The tag has 1,024 bits of memory, is tamper resistant, and can withstand extreme temperatures, sunlight, humidity, and vibration. Approximate cost of the tag is $10.

Cargo visibility. DOD and Savi Technology are partnering on two projects, Smart and Secure Tradelines (SST) and Total Asset Visibility (TAV). With

SST, tags are placed on shipping containers before they are shipped. The tags record any activity during transit, such as nonconformance to security measures, and make this information available on arrival of the containers at a port. The tags also include detailed information on what is inside the containers.

TAV was created by Savi Technology to track cargo containers and record their location at any time during transit. The system is based on Savi's Universal Data Appliance Protocol, which allows integration of devices such as RFID and global positioning systems.

HAZMAT recognition. The Defense Logistics Agency has organized a test of Advanced HAZMAT Rapid Identification, Sorting, and Tracking (AHRIST). Currently, no system exists to alert receiving personnel automatically before HAZMAT arrives. The objective of the AHRIST project is to track HAZMAT through the supply chain. The Micron Technologies tags used in the test have a read range of 10 feet in North and South America and 128 bits of storage.

Product tracking. DOD is working with several companies on materiel-tracking applications. In 1999, Symbol Technologies was awarded a 5-year, $248 million contract for auto ID technologies and services. Projects under this contract include tracking of materiel and personnel deployed throughout the world, tracking of supplies through global distribution centers, and advance identification of military personnel. The tracking system uses NATO (North Atlantic Treaty Organization) stock numbers and can distinctly identify 1.8 million line items. The computer system interface uses the IBM ES9000 Series mainframe to run Mincom's Management Information System. The system tracks goods received, performs spot-checks, and notes other factors such as batch number, shelf life, expiration date, and reparable or nonreparable designation.

Quality control. Quality control of meals, ready to eat (MREs), is currently being tested at the Army Soldier Systems Center at Natick, Massachusetts. Hardware and tags developed by Savi Technologies are used to inventory containers of MREs at supply points. Low-cost passive and semipassive RFID tags developed by Alien Technology are being used to identify MRE cases and pallets. This project relies on the MIT Auto-ID Labs' technology to track shelf life and the environmental conditions (temperature, humidity, and vibration) under which MREs are stored.

How Auto ID and DOD Come Together

The most important element missing from current DOD testing of RFID systems is standardization. A standard system for auto ID across DOD will facilitate inventory management and related applications, thereby creating increased readiness at a reduced cost. DOD could save billions of dollars by adopting a standard system.

Several possibilities exist for joint research between MIT's Auto-ID Labs and DOD, using the current open standards that are being administered by the Uniform Commercial Code Council.

Tracking. By using mass serialization and the Office of NATO Standardization database, the EPC system will allow for real-time tracking of supplies with a single technology. A standardized inventory management system will give visibility of the location of spare and repair parts. Maintenance and repair then will be more efficient, and applications such as predictive maintenance will be possible.

	Weapons/ Machines	Ammunition	HAZMAT	MREs	Everyday Supplies	Shipping Port Containers	Personnel
Tracking	Auto ID	Auto ID	Being tested	Auto ID	Auto ID	Being tested	Being tested
Shelf Life-Product Information	Auto ID	RFID	Being tested	Being tested	RFID	RFID	
Inventory Management	Auto ID	Auto ID	Auto ID	Auto ID	Auto ID	Auto ID	
Recall	RFID	RFID	RFID	RFID	RFID	RFID	
Security	RFID	RFID	RFID	RFID	RFID	RFID	RFID
Military-Civilian Interface				Auto ID	Auto ID		Auto ID

Potential implementation of auto ID in the DOD supply chain.

Product identification. The EPC is a unique identifier that points to a database holding all information about an item. The current universal product code holds only limited information about a product and its manufacturer. With the EPC system, military planners anywhere along the supply chain will be able to access detailed information, including suppliers of each component of the item, transportation methods, and environmental storage conditions for the item throughout its lifetime. With more information about an item, military planners will be able to make better decisions.

Military-civilian interface. By using the same standard as industry, DOD will be able to communicate with commercial vendors and have direct visibility of inventories at civilian locations. An active military-civilian interface also will give vendors and military planners the opportunity to collaborate on ways to enhance readiness for war. Precise inventory levels by version will be possible with the EPC system. (A part number is not unique because a new number is not assigned each time an engineering change is made. Therefore, an inventory of spare parts for equipment that has a long life cycle often includes many different versions of a part as changes are made over the life of the equipment.) Civilian warehouses will be able to assist the military in stockpiling enough supplies to sustain several simultaneous war scenarios. This could take the form of maintaining "warm" inventories that are reserved for military operations, yet continue to cycle into normal shipments. This practice would reduce losses resulting from exceeding shelf-life limits. Using inventory pooling between civilian and military organizations would significantly reduce waste and improve readiness.

Predictive maintenance. The military currently employs a preventive maintenance policy for complex equipment. This means that regularly scheduled overhauls take expensive weapon systems out of operation for long periods of time. This policy is not efficient. With the serialization capability of the EPC, the history of every service part can be stored in a database. The history is a vital piece of information in predicting failure. Rather than scheduling overhauls on a periodic basis, maintenance could take place when a military planner sees that a part is likely to fail. Service parts could be pre-ordered. Instead of ordering a larger, more expensive system part, such as an aircraft engine, component parts that are likely to fail, such as water pumps, could be identified and stocked. Vehicles would operate at their maximum efficiency, which would reduce total life-cycle costs.

Budgeting. The real-time inventory information provided by the EPC system would improve budgetary decisionmaking. Current budgetary decisions are sometimes based on faulty information about inventory levels and troop readiness. The EPC system would reduce uncertainty caused by counting or timing errors in the information used for budgetary purposes.

The chart on the opposite pape provides a summary of specific RFID possibilities. Boxes marked "RFID" suggest that identification tags would improve efficiency in that area. Boxes marked "Auto ID" indicate areas in which the networked EPC system would be substantially more beneficial than a proprietary RFID system. The boxes marked "Being tested" indicate that RFID technology is currently being used or tested.

More and more, success in warfare depends on accurate information on the identity and location of parts and systems. This is true not only for battlefield operations but also for the support functions that must get supplies to the right place at the right time. In the future, DOD will be expected to enhance readiness for war while minimizing procurement costs. The Auto-ID Labs' EPC system technology will play an important role in this enhancement by providing open standards for both DOD and industry while creating unprecedented total supply chain visibility. **ALOG**

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Obtaining and Purifying Water in Iraq

BY FIRST LIEUTENANT JARRED WM. GUTHRIE

During Operation Iraqi Freedom, the 3d Armored Cavalry Regiment (ACR) was responsible for a large portion of north and northwest Iraq. The 3d ACR Support Squadron, or "Muleskinner Squadron," set up operations on an Iraqi air base near Al Asad, which eventually came to be known as Camp Webster. Responsible for the logistics support of an entire regiment and its attachments, the Muleskinner Squadron successfully pushed every class of supply and sustained the 3d ACR's high level of operational readiness.

Water supply was a major concern in continuing combat operations. To move logistics as far forward as possible and decrease reliance on rear support areas, the Muleskinners needed to establish a centralized water production site capable of supporting 3d ACR's three line squadrons and one air squadron. Camp Webster was situated near the Euphrates River. However, because security was a concern and separating the reverse osmosis water purification unit (ROWPU) section (the "water dawgs") from the rest of the Muleskinners' Supply and Transportation Troop would have stretched life-support assets, the water purification section turned their focus toward finding a water source within Al Asad's public works systems.

As with most modern air bases, Al Asad was equipped with an intricate net of fire hydrants. The

> Throughout military history, the vast majority of casualties in war have been from disease and nonbattle injury. This loss of manpower can be drastically reduced by ensuring that soldiers have adequate supplies of potable water.
>
> —Field Manual 10–52
> Water Supply in Theaters of Operations

The 3d Armored Cavalry Regiment "water dawgs" establish a water distribution point by a swimming pool on an air base near Al Asad, Iraq. The swimming pool serves as a reservoir for water to be purified by the four ROWPUs set up around it.

water dawgs tapped into the hydrant network and redirected the water to a 400,000-gallon outdoor swimming pool. Once the pool was filled, it served as a manmade water source for the ROWPUs. The hydrant water was cleaner than the Euphrates River, so using it increased the life of the ROWPU filters and decreased the amount of chemicals needed to purify the water for consumption. The entire operation—four ROWPU systems and a 50,000-gallon storage bag—yielded between 50,000 and 70,000 gallons of water daily. Fifty percent of the water pumped through the ROWPU from the pool was potable, compared to 30 percent of the water pumped from the river. The water in the pool was fairly clean since it came from the Iraqi water system. So, after it was treated, the brine (water that has been through the ROWPU but still is not potable) was adequate for nonpotable uses because it had all but the suspended solids removed from it. The water dawgs successfully provided potable water to the entire 3d ACR and attachments for most of their mission during Operation Iraqi Freedom.

The Importance of Water

Fuel and water are the lifeblood of any conflict. However, the importance of water is even greater in arid regions like Iraq. Heatstroke affects 1 out of every 1,000 soldiers in arid regions. Because people need to drink more water in desert areas, yet less is available, the military has become increasingly more inventive in finding ways to resource this vital fluid. In these regions, the onus is on the support elements to find alternate sources of the water needed for continued mission achievement.

During the last two decades, the U.S. military has repeatedly found itself involved in arid regions. Based on current trends, it is safe to assume that the United States may in fact continue to operate in these areas in the coming years. If this is the case, water supply could be a problem for U.S. forces.

How to Obtain Water

One of the most important planning factors when considering water requirements is the operational environment. With the increased use of technology and the implementation of 21st century warfighting techniques, the world has seen combat stray from the battlefields of yesterday into the major cities of today. The most efficient and successful sources of water during deployment often are host nation support systems. Bottled or processed water may not be available in theater. However, municipal or private fixed facilities may be used if their water sources are certified as potable and are readily available.

When potable water is not available, the Army's answer to bulk water resupply is the ROWPU. The ROWPU system's primary purpose is to extract bulk water from almost any source, purify it using a series of media separator filters and chemical cleaners, and dispense it for consumption. The ROWPU's ability to draw from almost any water source has made it an invaluable asset in arid regions. The only limiting factor for using ROWPUs in an arid environment is the low number of available, viable water sources.

Where to Locate the Water Supply Point

Sound logistics practices require water supply points to be as far forward as possible. The most forward location is usually the brigade support area, and, if this area happens to be urbanized, the closest water source may be a public works system and not a nearby

Uses for Potable and Nonpotable Water

Potable

- Drinking
- Heat treatment (cold water and ice for troops)
- Personal hygiene (shaving, daily sponge washing, brushing
- Food preparation
- Medical staff and equipment cleaning
- Hospital medical treatment

Nonpotable

- Centralized hygiene (showering)
- Laundering
- Preparation of human remains and cleaning of equipment
- Nuclear, biological,teeth) and chemical decontamination
- Vehicle maintenance
- Aircraft washing
- Engineer construction

river or lake. In that case, water can be drawn from sources within the infrastructure of the area of operations. Existing water facilities often can be used with less time, effort, and equipment than it would take to develop a new field source such as a river or lake. Sources to be considered include reservoirs, manmade wells, fire hydrant systems, irrigation systems, water plants, water towers, quarries, and swimming pools.

How MOUT Affects Water Supply

Most urban areas in arid regions are located close to existing water sources. Since future combat most likely will be in military operations on urbanized terrain (MOUT) environments, U.S. forces probably will operate near a water source in arid regions. That water source no doubt will be a sustaining factor for the local populace and also can be so for U.S. troops. Logisticians should take into consideration if the water in the region is potable. Potable water is not required for all uses (see chart above). However, to preclude the need for two separate water systems, Army doctrine requires that all water needs be met with potable water.

When setting up operations in urban areas, security concerns, disease issues, or overall stability of the terrain may preclude establishing a water purification and distribution point at a potential water source. Water purification personnel are especially susceptible to waterborne diseases, such as malaria and schistosomiasis, that are common around water sources in undeveloped nations. Rivers and lakes are ideal insect breeding areas, especially for mosquitoes hosting diseases like malaria. [Schistosomiasis is a waterborne disease contracted by walking or working in contaminated water containing the larvae of certain schistosomes and may result in infection and gradual destruction of the tissues of the kidneys, liver, and other organs.]

Advantages of Using Existing Facilities

Article 54 of the Geneva Convention, Protocol 1, adopted in 1977, states that military forces are prohibited from attacking, destroying, or rendering useless "drinking water installations and supplies and irrigation works." Military forces cannot take actions against these objects if they will leave the civilian population with such inadequate food or water as to cause its starvation or force its movement. Although this seems restrictive, one interpretation is that military forces can use host nation "drinking water installations and supplies and irrigation works" for their troops as long as the local populace is not adversely affected. That being said, water drawn from existing facilities and ground water sources is often a better option than surface sources such as rivers, lakes, and oceans. Water from existing facilities generally has fewer chemical and biological contaminants than surface water. Using existing facilities and ground water sources requires fewer chemicals and filters in the purification process.

In addition to limiting the use of expendable supplies, using existing facilities or ground water sources has another advantage. If military forces aggressively occupy an area, the power needed to operate water pumps and plants may not be available. Regardless of power sources, manmade water sources are almost always gravity-fed at some level. Therefore, water can still be drawn from external sources such as hydrants, pipes, and wells.

Overall, the possibilities for water sources within urbanized environments are nearly limitless. The key to capitalizing on the many benefits of using one of these sources is good reconnaissance and planning. Logistics units conducting water support missions should be both innovative and flexible. The world is three-fourths water; it is just a matter of finding the right place to tap into it. **ALOG**

First Lieutenant Jarred Wm. Guthrie is serving in Operation Iraqi Freedom with the 3d Armored Cavalry Regiment. He has bachelor's degrees in systems engineering and American legal studies from the U.S. Military Academy and is a graduate of the Quartermaster Officer Basic Course.

Maintenance Assessment Guide for the New Reserve Component Commander

BY SERGEANT FIRST CLASS JAMES I. ADAMS, JR., ILARNG

So you are the new commander of a National Guard or Reserve unit. As you probably have learned by now, Army National Guard and Army Reserve unit commanders face challenges different from those faced by Active component commanders. The Reserve component commander must plan unit training and maintenance within a limited timeframe. Maintaining equipment while meeting training and mission requirements can be particularly challenging. As a Reserve component commander, you will need to keep your unit's equipment up and running, and you will want to improve your "percentage of on-hand equipment" rating. To do this, you first will need to assess where you stand.

The Assessment

You will need to start with Department of the Army Pamphlet (DA Pam) 750–1, Leader's Unit Maintenance Handbook, and your hand receipt. Meet with your hand receipt holders and determine the locations of all of the equipment on the hand receipts. Then conduct an initial inspection. Walk around your equipment storage areas, and see if your unit equipment in your armory is stored properly. It would be beneficial to request a Command Maintenance Evaluation Team (COMET) inspection, review the last COMET inspection results, or use a COMET checklist to conduct your own inspection. Remember that the unit's warfighting tools include not only transportation and combat vehicles but also tents, communications equipment, and ancillary equipment. While conducting the inspection—

• Use the preventive maintenance checks and services (PMCS) tables found in the equipment technical manuals.

• Check the calibration or inspection dates on the test and diagnostic, NBC (nuclear, biological, and chemical), and other equipment that requires testing.

• Check the condition of your weapons by inspecting at least 25 percent of the inventory of each type of weapon.

• Ensure that the arms room has a functioning dehumidifier.

• Walk around the motor pool and look at, touch, and operate the equipment you have signed for.

• Use PMCS checklists to determine if the equipment is fully mission capable.

The maintenance management warning factors shown above will prove helpful in analyzing the inspection results.

Maintenance Management Warning Factors

• Ripped or missing canvas on vehicles and trailers.

• Flat tires on more than one or two vehicles or trailers.

• More than 10 percent of the equipment inoperative when **you** try to operate it.

• Constant increase in your not-mission-capable percentage before annual training or inspections.

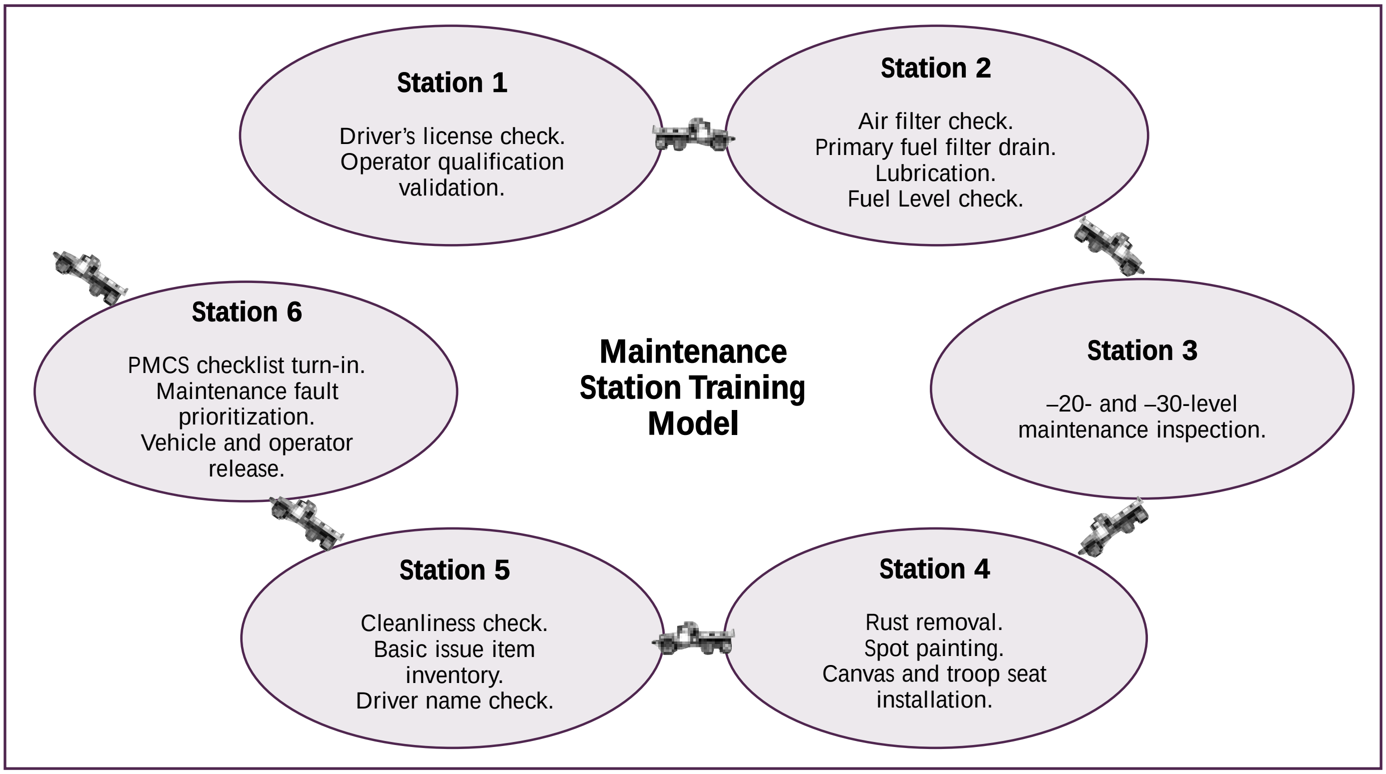
• A lot of rust on the equipment.

• Many improperly stored MTOE (modification table of organization and equipment) equipment items.

If you did not find any of the problems listed in the warning factors chart, congratulations; your unit is ready for mobilization. However, like a high percentage of commanders, you may find several problems in your motor pool. Once the problems are identified, you must develop solutions for them.

PMCS Method

The diagram on the next page shows a maintenance station training model that can be used to inspect and repair equipment. The model is designed primarily to teach section sergeants, platoon sergeants, and platoon leaders how to perform PMCS of their equipment properly and how to better supervise the troops responsible for completing the PMCS. The key to the success of this operation is command supervision and attendance. All parties involved in vehicle assignment, issue, and maintenance should participate. Leaders familiar with this process can conduct PMCS with minimal maintenance support (one or two mechanics) and some minor supplies such as sandpaper, wire brushes, and paint.



The purpose of each station follows.

Station 1: The motor sergeant or prescribed load list (PLL) clerk checks operators' licenses and vehicle operation qualification documents. Maintenance personnel supervise operator-conducted PMCS. The motor sergeant or PLL clerk dispatches the vehicle to the operator.

Station 2: Operators lube the vehicle, check fluid levels, and make operator-level repairs. Section sergeants supervise.

Station 3: Mechanics perform –20- and –30-level inspections and replace parts or repair minor faults. [Vehicle and equipment maintenance is done at three levels: –10 level is conducted by the operator, –20 level by unit maintenance personnel, and –30 level by direct support maintenance personnel.]

Station 4: Operators and crew remove rust, spot-paint, and install troop seats and canvas.

Station 5: Section sergeants inspect for cleanliness, conduct a basic issue item inventory, and place the name of the assigned driver on the windshield.

Station 6: The commander and motor sergeant review paperwork, determine repairs needed, and decide priority for vehicle repair. The commander, executive officer, or platoon leader authorizes the vehicle or equipment to be parked or stored.

If you use the maintenance station training model to help plan PMCS, remember to start with your key leaders and mid-level personnel. Coordinate the stations—assign each task to specific personnel. If you do not have –30-level mechanics, request support from your direct support activity. The PMCS site should be an open area with cover, such as a maintenance tent, drive-through barn, or building. Ensure that all needed materials, such as fluids, wire brushes, and paint, are available. Last but not least, plan and dedicate time for the operation.

Even if problems do not exist now, the maintenance station training model will help avert future problems. Use it with organizational and direct support technical inspections to help determine your course of action.

Maintenance Resource Assessment

After deciding on your course of action to correct the deficiencies you found, you need to determine if your unit personnel can handle the tasks. Begin by assessing your maintenance section's capabilities. Conduct a maintenance resource assessment to calculate your maintenance sustainment posture. To do this, subtract anyone who will not be working on the equipment, such as the PLL clerk and the motor sergeant, from the number of authorized maintenance personnel. Then subtract those who are not military occupational specialty (MOS) qualified and those who will not be at the drill because of school or other factors. Divide the results by the number authorized. This gives you the "wrench-turner factor."

For example, assume that you are authorized a 13-person maintenance section comprising an E–7 motor sergeant, an E–6 lead mechanic, an E–4 automated systems clerk, 3 E–5 mechanics, 4 E–4 mechanics, an E–3 mechanic, an E–4 communications repairer, and an E–4 generator repairer. If they are all MOS qualified and will all be at every drill, the personnel rate for the formula is: 13 – 0 = 13, and 13 ÷ 13 = 1 (or 100 percent). So you would count on 100 percent of your mechanics to be available to conduct maintenance. But that is not realistic, so you need to estimate how many personnel actually will be available.

Assume that the motor sergeant and the PLL clerk's duties will preclude their conducting any maintenance. Remove them from the equation, and you have an effective maintenance strength of 11. Look at the other personnel and determine how much time you can expect them to be at drill and working on equipment. Subtract time for mandatory training, such as the Primary Leadership Development Course, and time that they will spend on other tasks, such as completing administrative duties. Soldiers who have not completed basic or advanced training cannot be expected to perform at 100 percent, and you know they will be gone for training part of the year. For instance, if you know one of your soldiers will be gone for training for 12 of the 24 drill days, you would count him as only 0.50 person. If he were not yet MOS qualified, you might count him as half of that, or 0.25 person.

So, let's recap. After removing the PLL clerk and the motor sergeant, your maintenance strength is 11 [13 – 2 = 11]. You have two soldiers who will be attending basic or advanced training for 12 of the drill days, so you count them as 0.25 each, for a total of 0.50 [11 – (2 – 0.50) = 9.50]. You count the lead mechanic as 0.5 because he has other duties. That leaves a total of 9 personnel who will be working on vehicles during drills [9.50 – 0.50 = 9]. Divide that by 13—the number of authorized maintenance personnel—and you get a wrench-turner factor of 0.69 [9 ÷ 13 = 0.69].

The upcoming year has 24 drill periods. In maintenance, we usually assume that each full drill day is 8 hours. Therefore, each mechanic should be available for 192 hours. However, 25 percent of the training schedule is set aside for conducting PMCS on the unit's equipment, and required training is scheduled for 2 days. That leaves 128 hours of drill time per mechanic [(192 x .75) – 16 = 128], or 1,664 total hours [128 x 13 = 1,664]. Now multiply the wrench-turner factor by the 1,664 hours to calculate the effective total maintenance time available to your maintenance section [0.69 x 1,664 = 1,148]. Repairs, especially those that affect your readiness or annual training (AT) mission, will consume an average of 35 percent of the time, leaving 65 percent of the time available for maintenance tasks. Thus, 746 hours are available for servicing rolling stock and ancillary equipment [0.65 x 1,148 = 746]. This may seem like it is not enough time to complete annual and biennial services, but you now have a realistic estimate of the time you have available for maintenance.

The AT period should not be included when conducting the maintenance resource assessment because the unit could be conducting overseas deployment for training, a garrison AT period, home station training, or a rotation at the National Maintenance Training Center at Camp Dodge, Iowa. If "summer camp" allows time for additional maintenance, use the time wisely and cherish it. You will seldom get the opportunity to conduct maintenance during summer camp.

You should require vehicle and equipment operators to read *PS Magazine* and ensure that they assist with the organizational services for the equipment that they operate, as required by DA Pam 738–750, Functional Users Manual for The Army Maintenance Management System (TAMMS). This procedure ensures that enough skilled maintenance personnel are available to meet maintenance needs.

Developing the Skills of Maintenance Personnel

Several options are available to help develop the skills of the maintenance personnel in your unit. You can request support from a maintenance assistance and instruction team. You can ask your higher headquarters or supporting units for help, such as sending –30-level mechanics to assist with your station training, onsite repairs, or new equipment fielding. If maintenance is backlogged enough to affect readiness, request assistance by job order and be ready to assist as much as possible.

You or your maintenance officer should attend the Battalion Maintenance Officer Course. Whether he is the executive officer or platoon leader, the person who reports to you on the maintenance status, rates your motor sergeant, or controls your unit maintenance program must be able to read and understand maintenance regulations and DA Pam 738–750.

The challenge is yours. Overseeing your unit's maintenance program is as important as all other aspects of command. Remember that if the best tactically trained troops in the world cannot get to where they need to be, do not have properly functioning equipment, or cannot be supported organically, the purpose of all of their training is defeated. **ALOG**

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JOPES and Joint Force Deployments

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

The Joint Operation Planning and Execution System provides vital information for managing force movements. The author explains how the elements of JOPES fit together.

A newly arrived Army logistician assigned to the U.S. Central Command's J–3 staff is tasked to assist in planning for an upcoming rotation of joint forces operating in Iraq. Hundreds of units will be involved in the deployment and redeployment, and the logistician's boss—a Marine Corps artillery officer—wants him to ensure that this rotation will have an increased fuel storage capacity of 60,000 gallons in case the local fuel pipelines continue to suffer periodic interdiction. His boss adds that he doesn't care which service provides the personnel and equipment needed to expand fuel storage capabilities, just as long as the increased storage is available within the next 60 days. He also wants the logistician to use this planning effort as an opportunity to gain an understanding of JOPES.

Like the subject of this scenario, all logistics leaders should have a basic understanding of JOPES—the Joint Operation Planning and Execution System. In an era characterized by joint operations, a logistician who knows about JOPES and the information that it provides on the movement of forces and their equipment is better prepared to provide logistics support to customers from all of the services.

An article about JOPES tends to be dry reading since learning about it is similar to studying calculus; the nature of the subject does not make for an entertaining presentation or an easy read. Nonetheless, I believe the result is worth the effort because the topic of JOPES (or a future equivalent) will be addressed countless times throughout a logistician's career.

JOPES is an electronic information system that is used to monitor, plan, and execute mobilization, deployment, employment, and sustainment activities associated with joint operations. It provides users with access to joint operations planning policies, procedures, and reporting structures that are supported by communications and automated data processing systems. Force movement information captured in JOPES is used by operators and planners to maintain and manage a database called the Time-Phased Force and Deployment Data (TPFDD). The TPFDD database is used to plan and execute the strategic movement of forces from one geographic region to another. [It must be remembered that JOPES is used for functions other than planning and managing force movements. The term "Little JOPES" is often used to refer to the data within JOPES associated with force movements (TPFDD).]

The decision to deploy forces, like those involved in the Central Command (CENTCOM) petroleum storage example, is based on high-level operation plans (OPLANs), concept plans (CONPLANs), functional plans, and operation orders. The ultimate decision to deploy forces abroad (in this case, to Iraq) is made by the President and the Secretary of Defense. They oversee the entire Joint Planning and Execution Community, which includes, among others, the regional combatant commanders, the U.S. Transportation Command (USTRANSCOM), and the U.S. Joint Forces Command (USJFCOM).

If time allows, military plans can be developed through careful study and deliberation in what is called the "deliberate planning process." However, in response to actual world events, plans can be developed expeditiously. This is called "crisis action

The JOPES TPFDD database provides managers of strategic force movements with information in such areas as the modes of transportation deploying units will use. Containerships, such as the* MV LTC John U.D. Page *(left), are frequently used to move equipment.

planning." The information technology and databases of the JOPES force flow support both processes.

Supported Command and Supporting Command

The service components of the supported command (usually the supported command is the U.S. European Command, U.S. Pacific Command, U.S. Southern Command, or CENTCOM) are responsible for determining the types of forces they require and the arrival dates and locations of those forces. In the example, CENTCOM has decided that it requires a petroleum storage force. The supporting commands (primarily USJFCOM and USTRANSCOM) are responsible for identifying the specific forces that will deploy, the locations from which they will deploy, and the dates by which they must depart in order to arrive by the date specified by the supported command.

USJFCOM is composed of the Army Forces Command; the Air Force's Air Combat Command; the Navy's Fleet Forces Command; and the Marine Corps' Marine Forces Atlantic. USJFCOM works with the services to determine which units will deploy to meet the requirements identified by the supported command. USTRANSCOM arranges for the strategic movement of forces through its three component commands: the Army's Military Surface Deployment and Distribution Command, the Air Force's Air Mobility Command, and the Navy's Military Sealift Command.

JOPES Reference Databases

There are four databases that are essential to managing the movement process within JOPES: the Global Status of Resources and Training System (GSORTS), the Geographic Location (GEOLOC) file, the Type Unit Characteristics (TUCHA) file, and the Type Unit Equipment Detail (TUDET) file.

Global Status of Resources and Training System. GSORTS contains personnel, equipment, and training data on every Department of Defense (DOD) unit (both Active and Reserve components) and depicts each unit's readiness for deployment. This database also contains basic unit identity data, such as each unit's name, unit type, current location, home station location, and unit identification code (UIC). The UIC is a six-character alphanumeric code that is used to identify each Active and Reserve component unit in the armed services. There are tens of thousands of different UICs; however, only a few UICs designate petroleum storage units.

Geographic Location file. The GEOLOC file depicts locations associated with the movement of forces. These are identified by narrative names and by GEOLOC codes that have been assigned to the locations. GEOLOC codes are four-character alphabetic designations that represent specific places throughout the world, including airports, seaports, and military installations. About 55,000 different GEOLOC codes are stored in the JOPES database. These codes are managed by the National Geospatial-Intelligence Agency [formerly the National Imagery and Mapping Agency] and can be obtained through the Global Command and Control System (GCCS). In addition to GEOLOC codes, the JOPES database designates geographic locations in several other ways: longitude and latitude descriptions, International Civil Aviation Organization codes, and Military Standard Transportation and Movement Procedures (MILSTAMP) codes.

Type Unit Characteristics file. The TUCHA file is maintained by the Joint Staff, J–3 Operations Directorate, with assistance from the Defense Information Systems Agency. The file contains passenger and cargo information for generic types of units. Each generic type is designated by a five-character alphanumeric unit type code (UTC). Dozens of individual units, each with its own UIC, can share the same UTC. For example, the UTC that best describes petroleum storage for the Army is J5TNN, which applies to a generic petroleum supply company.

The TUCHA information for a particular UTC includes the unit generic name, the applicable reference document for that unit, unit equipment, the number of different cargo category codes (CCCs) associated with the unit, and the number of authorized unit personnel. The CCC is a three-character alphanumeric code that identifies shipping characteristics for specific cargoes. CCCs are used by USTRANSCOM to determine the transportation assets needed to move a unit.

Type Unit Equipment Detail file. A TUDET file lists all of the applicable CCCs for each UTC and describes individual items of equipment. For each item of equipment, there is a separate line entry that includes the item's description (both item name and identifying number); its applicable CCC; its length, width, and height (expressed in inches); and its weight, area, and volume (expressed in short tons, square feet, and measurement tons, respectively). [A short ton is the standard U.S. ton of 2,000 pounds and measures weight. A measurement ton is a unit of volume used in shipping and equals 40 cubic feet.] For each CCC, the TUDET includes the total amount of short tons, measurement tons, square feet, and MBBLs to be shipped. ("MBBL" is an abbreviation for 1,000 barrels. Since one barrel holds 42 gallons, one MBBL, or a thousand barrels, equals 42,000 gallons.)

Time-Phased Force and Deployment Data

These four databases—GSORTS and the GEOLOC, TUCHA, and TUDET files—are integral parts of the JOPES TPFDD database, which is used to plan and execute the movement of forces. TPFDD provides answers to the following questions: Which forces are committed to the operation? What troops and equipment will be moved? From where will forces and equipment depart, and to what location will they be moved? Will they move by air or by sea? When will the movements take place?

JOPES organizes the information obtained from the four databases, along with scenario-specific information, into a specific TPFDD plan known by a Plan Identification Number (PID). A PID directly corresponds to an OPLAN or CONPLAN and contains all of the unit line numbers and force modules (described below) associated with that plan's movement of forces. Dates associated with the movement of forces are known as C-days and N-days. A C-day is an unnamed day on which a deployment operation will commence. When used in conjunction with a C-day, an N-day indicates the number of days preceding the C-Day. For example, N–1 refers to 1 day before C-day, N–2 refers to 2 days before C-day, and so on. At execution of the deployment, an actual date is assigned as C-day.

Unit Line Numbers and Force Modules

A unit line number (ULN) is an alphanumeric field (from two to seven characters in length) that describes a particular force in the TPFDD database. The information contained in the ULN is used as the basis for organizing TPFDD-related planning, reporting, and tracking data on the movement of forces and equipment from points of origin to deployed destinations. The ULN is a unique identifier for a TPFDD force requirement and is the cornerstone on which all movement data are built.

Personnel from the supported command (including components) establish force requirements. When supported commands do not have the units in theater needed to satisfy requirements, supporting commands designate units for deployment to the supported command's area of operations. This process is known as sourcing. Force requirements and sourcing information are needed to plan and execute the strategic movement of forces.

Entering the information that guides the movement of forces is not an easy task. Users entering force movement data in the JOPES database must be careful to enter accurate information (much of which is in coded format) because incorrect data cause delays in force deployments and inefficient use of expensive strategic lift assets. Personnel who determine and enter ULN data are known colloquially as "JOPESTERS."

Forces described by ULNs, as found within a PID for a specific force movement, are organized by using force modules. According to Chairman of the Joint Chiefs of Staff Manual (CJCSM) 3150.16B, Joint Operation Planning and Execution System Reporting Structure (JOPESREP), Volume I, a force module is—

> a grouping of combat, combat support, and combat service support forces, with their accompanying supplies. Non-unit resupply and personnel necessary to sustain forces for a minimum of 30 days may be included. The elements of Force Modules are linked together or are uniquely identified so that they may be extracted from or adjusted as an entity in the Joint Operation Planning and Execution System databases to enhance flexibility and usefulness of the operation plan during a crisis.

In effect, force modules provide a means of organizing ULNs (remember a ULN designates a specific force) into groups useful to commanders and staffs. Any ULN could be part of several force modules. For instance, one force module may comprise all the ULNs of a specific brigade. Another force module may contain those ULNs departing from a specific port of debarkation. Yet another force module may contain all logistics support battalions. Guidance on developing force modules can be found in CJCSM 3122.02B, Joint Operation Planning and Execution System (JOPES), Volume III, Enclosure H, and in supplemental TPFDD instructions written by the supported command.

ULN Information

A ULN describes one or more service members and their equipment that share a movement from the same origin to the same destination, at the same time, using the same transportation mode and source. ULNs contain five major types of movement information: the deploying units, the dates associated with the movement, the locations involved with the movement, the number of personnel and the type and quantity of cargo to be moved, and the type of transportation that will be required to move the forces.

Deploying Units

For each ULN, a representative from the supported command (the command requesting forces) enters a UTC, which will extract the corresponding narrative description of the force required from the TUCHA file. For instance, if the supported command requires a field artillery battalion with 155-millimeter (MM) towed cannons, it will use the TUCHA file to select a UTC of "1FUTT." This UTC has a narrative force description of "FA BN 155MM TOWED 3x6."

A UTC can represent a force that ranges in size from an 18,000-soldier Army division to a brigade, a battalion, a company, a platoon, or an individual service member. There are thousands of different UTCs. The corresponding size of the force requested is identified in the unit level code, which is a three-character alphabetic code used to specify the organizational level of a force. After the supported command has requested the generic types of units it requires by using UTCs, the supporting command (the USJFCOM is the force provider for most continental United States-based forces) responds to these requirements by tasking specific units by UIC to deploy and adding this information to the existing ULNs through the GCCS.

Movement Dates

In a manner similar to that used to identify units for deployment, both the supported and the supporting commands determine the dates when forces will move through those geographic locations associated with the forces' deployment. In chronological order, the milestone dates associated with the movement of forces are—

- Ready to load date (RLD) at the unit's point of origin.
- Available to load date (ALD) at the port of embarkation (POE).
- Earliest arrival date (EAD) and latest arrival date (LAD) at the port of debarkation (POD), which is known as the EAD–LAD window.
- Required delivery date (RDD) at the unit's final destination.
- The regional combatant commander's required delivery date (CRD).

The RLD is the date that a force is ready either to depart its home station using organic transportation assets or to begin loading its equipment and personnel onto USTRANSCOM-provided transportation for movement to the POE. The ALD describes the day that a force is ready to begin loading its personnel and equipment at the POE.

The supported command determines the EAD, LAD, RDD, and CRD because the locations associated with those dates are in the supported commander's area of operations. The EAD and the LAD describe a window of time during which a force must arrive at the POD. Planners normally incorporate a range of 3 days for air arrivals, 7 days for sea arrivals (although Caribbean deployments use less than 7 days, while Southwest Asia deployments require a longer period), and 5 days for land-related arrivals.

The CRD is the date when forces need to be in place, as initially determined by the supported commander. Although the CRD and the RDD can be the same, the realities of moving forces usually will prevent the positioning of forces as quickly as the CRD stipulates. In that case, a more realistic date—the RDD—is established. In many instances, the RDD location is the reception, staging, onward movement, and integration (RSO&I) site. It is there that personnel receive their equipment, which may have been sent separately, and begin preparing for movement to a staging base or a tactical assembly area.

Cargo Size	Short Tons	MTONs
Bulk	25	8
Oversized	50	25
Outsized	75	50
NAT	25	25

An example of level-2 cargo detail.

Movement Locations

Each ULN tracks at least four different movement locations: the unit's point of origin, its POE, its POD, and its destination. If necessary, an intermediate location (ILOC) also is tracked. An ILOC is a stopping point in the deployment routing of a unit and is used for a unit layover lasting a specified time, normally longer than a day. This layover often is used to unite the personnel and cargo of split shipments. A unit may need to stop at an ILOC when moving from its point of origin to its POE, from its POE to its POD, or from its POD to its destination. Movement locations are entered into the JOPES database using GEOLOC codes.

The supporting command determines the preferred POE. The force associated with the UIC identified in the ULN will travel to the POE from its point of origin. Normally, a unit's point of origin is its home station. However, the point of origin could be a training facility or a temporary location.

Personnel, Cargo, and Transportation

JOPES personnel and cargo information is expressed in four levels of detail. (There are two additional levels, 5 and 6, but these levels are not used in JOPES.) Personnel information can range from a simple expression of the aggregate number of passengers (level 1) all the way to a level of detail that includes the names and Social Security Numbers of each passenger (level 6). The JOPES database contains only level 1 personnel information.

Cargo detail can range from a level 1 expression of total tonnage (expressed in short tons) to a specific listing of the weight, volume, dimensions, and CCC for each specific item (level 6). Unlike airlift—where the hauling capacity is determined by the weight limitations or allowable cabin load of the aircraft—the primary limiting factors involved with sealift are the area and volume of the items to be moved. This is why cargo size, as expressed in square feet, and cargo volume, as expressed in measurement tons (MTONs), are

CCC	Expanded CCC Description	Short Tons	MTONs	Square Feet
M7C	Ammunition/Bulk, Accompanying Unit/40-ft CT	.1	1	1
R1D	Road Vehicle, Non-Hazardous/Outsized, Unit/Not CT	22.3	77	337
A2B	Vehicle, Non-Road Marching/Oversized, Unit/20-ft CT	4.9	15	91

Examples of cargo category codes (CCCs) (level-3 detail).

such important considerations for movement by sea.

Level 2 detail (called "Summary Data") segments cargo into four categories: bulk, oversized, outsized, and nonair transportable (NAT). Bulk cargo can fit on a 463L pallet. (The 463L pallet is used for moving cargo by air. It is 108 inches long and 88 inches wide and can carry cargo weighing up to 10,000 pounds that does not exceed 96 inches in height.) Oversized cargo is too big for an 463L pallet but can fit inside a C–141 cargo plane. (The C–141 is being replaced by the C–17.) Outsized cargo is too big for a C–141 but can fit inside a C–5 or C–17. Cargo that is too big for movement by aircraft and therefore must be moved by sealift is called "nonair transportable."

When an item is measured in feet, its length multiplied by its width provides its area in square feet. The length of an item multiplied by its width multiplied by its height provides its volume in cubic feet. Since 1 MTON equals 40 cubic feet, cubic feet can be converted into MTONs by dividing by 40. For example, let's take a utility truck that is 180 inches long, 86 inches wide, and 56 inches high. These measurements expressed in feet would be 15 feet long by 7.17 feet wide by 4.67 feet high. This truck therefore occupies an area of 107.55 square feet (15 X 7.17 = 107.55), and its volume equals 505.5 cubic feet (15 X 7.17 x 4.7 = 505.5), or 12.64 MTONs (505.5 ÷ 40 = 12.64). An example of level-2 detail is found in the chart on page 33.

Level 3 detail segments cargo based on its CCC. (CJCSM 3150.16B, Volume I, Table A–18, provides a listing and description of all CCCs.) Each of the three alphanumeric characters in the CCC provides different information. The first character indicates the type of cargo, if the cargo is hazardous, and if it is a vehicle, ammunition, bulk petroleum, self-deploying aircraft, and so forth. There are 15 different selections for the first character of the CCC. There are a total of 14 different selections for the second CCC character, which indicates if the cargo is unit equipment, nonunit equipment, or accompanying supplies and separates the cargo into bulk, oversized, outsized, and NAT categories. The third CCC character, which has 4 possible selections, indicates if the unit's organic vehicles can carry the cargo or if the cargo can be containerized in 20-foot or 40-foot containers.

Most cargo transported by sealift is placed within standard 20-foot or 40-foot containers. There are numerous advantages to containerizing cargo. Containers use space efficiently; for instance, they can be stacked on top of one another. Consider how much space this saves compared to parking numerous wheeled vehicles in a small parking lot or on the deck of a ship. Locked containers also protect the cargo inside from the elements and from theft, and containers can be moved easily using labor-saving materials-handling equipment.

The chart above shows an example of level 3 detail. It includes both the 3-character CCC and a narrative description of the CCC.

Level 4 detail identifies the specific movement characteristics of the items within each CCC. The length, width, and height dimensions of each item are shown in inches, along with the item's short tons, MTONs, and square feet. The quantity of the item per ULN is also shown. An example of level 4 detail is shown in the chart at right. The second column in the chart includes the Army's line item numbers (such as "T49255"), along with the item description. JOPES describes these types of numbers as equipment identification codes.

Split Shipments

A unit may move its personnel by air while its cargo moves by sea. The corresponding ULN entries are known as split shipments; in effect, two ULNs are created for the unit. The first four characters of the two ULNs are identical; however, the fifth position of one of the ULNs would have a "P" to indicate passenger movement, while the fifth position of the other ULN would have a "C" to indicate cargo movement.

Cargo Consolidation

To make efficient use of limited strategic transportation assets, USTRANSCOM will only schedule movements of units with ULNs that have 100 passengers or more or cargo of 15 short tons (30,000 pounds) or more. Units with ULNs that do not meet these thresholds must consolidate their movement requirements with other units so that the combined ULN data meet USTRANSCOM's threshold requirements.

CCC	Level-4 Item	Length	Width	Height	Short Tons	MTONs	Square Feet	Quantity
A2B	T49255 Truck, Light	166	79	80	4.9	5.2	91	1
J2C	F06972 Conveyor	251	41	27	1.6	4.1	71	2
R2B	L63994 Light Set	146	69	68	.9	10.0	69	4

Examples of level-4 cargo detail.

Additional ULN Data

The ULN also contains additional information that planners and operators use to manage the movement of forces. This information includes the mode and source codes, the load configuration code, and the discharge constraint code.

The mode and source codes describe how the cargo or passengers will be moved among geographic locations. There are five transportation modes: air, sea, rail, truck, and pipeline. The JOPES database uses a modified format to codify modes: "A" for air, "L" for land, "S" for sea, "P" for optional, and "X" to indicate that transportation is not required (for example, when the unit's POD and final destination are the same). The corresponding source code describes the organization that is providing the transportation. [Mode and source codes can be found in CJCSM 3150.16B, Volume I, Table A–9.]

The purpose of the load configuration code is to describe how cargo will be loaded for delivery to the POD, an ILOC, or the unit's destination. For example, cargo may be configured for airdrop, air assault, amphibious assault, or an administrative (nontactical) environment. [Load configuration codes can be found in CJCSM 3150.16B, Volume I, Table A–10.]

Discharge constraint codes describe the limitations or restrictions that exist at the POD, ILOC, or destination. A maximum of two of these codes per GEOLOC can be entered into the JOPES database. Examples of these codes include discharge constraint code "A" (the offload area can handle only 20-foot containers), discharge constraint code "B" (cargo can be offloaded only over the beach), and discharge constraint code "C" (the enemy is expected to oppose the landing of the cargo). [Discharge constraint codes can be found in CJCSM 3150.16B, Volume I, Table A–11.]

Transmission of Movement Data

All of the JOPES ULN data described above become an integral part of the GCCS, where data are transmitted using the Secret Internet Protocol Router Network (SIPRNET). Throughout DOD, 450 remote sites currently are allowed to enter JOPES force flow data. These remote sites are linked via the SIPRNET to 16 servers, where the JOPES entries are consolidated into integrated databases. Eventually, these 16 servers will be reduced to 4.

The accuracy of JOPES information depends not only on the skills of the planners entering the JOPES data but also on the reliability of the GCCS computer processes and the SIPRNET. Both are highly complex, and both can experience periodic failures for a multitude of reasons. Moreover, it is quite a challenge to derive a coherent, integrated database—accessible by computer network from locations throughout the world—from the tens of thousands of ULNs that constitute the overall movement database associated with each PID.

Engineers are continually upgrading the JOPES software in an effort to increase its capabilities, improve its responsiveness, and make the sophisticated software even more user friendly. Unfortunately, many of the JOPES force flow applications are not intuitive; users must make determined efforts to master the system. An excellent, week-long JOPES force flow course is taught at Fort Eustis, Virginia, but students who complete this instruction still need additional training, practice, and guidance when they return to their units before they become qualified JOPESTERS.

JOPES is the DOD-wide management information process that is used for planning and executing force deployments. It is networked and highly complex and requires accurate data entry from multiple sources. However, leaders who understand the processes involved with JOPES are in a better position to glean useful information from its database and to enhance the efficiency of the system itself. **ALOG**

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Sea Basing and Maritime Pre-positioning

BY MAJOR HENRY B. COOK, MSARNG

MV 2nd Lt John P. Bobo *is a container and RORO ship with the Maritime Pre-positioning Force.*

The Navy and the Marine Corps look to the sea to provide support bases for future expeditionary operations.

Sea Basing is one of the three fundamental concepts underlying Sea Power 21, which is the Navy's vision for how it will defend the Nation and defeat enemies in the 21st century. (The other concepts are Sea Strike and Sea Shield.) Sea Basing also is a principal enabling concept supporting Marine Corps expeditionary concepts, including Expeditionary Maneuver Warfare, Operational Maneuver From The Sea (OMFTS), and Ship-To-Objective Maneuver (STOM). Sea Basing is thus one of the key operational concepts that the Navy and the Marine Corps will use to fight and win the littoral conflicts of the 21st century.

The goal of Sea Basing is to project "joint operational independence" in the largest maneuver area on Earth—the oceans. Sea Basing will give the joint force commander the means to achieve accelerated deployment and employment times for naval power-projection capabilities and enhanced seaborne positioning of joint assets. Sea Basing will minimize the need to build up a logistics stockpile ashore, reduce the operational demand for sealift and airlift assets, and permit forward positioning of joint forces for immediate employment. The overall intent of Sea Basing is to make use of the flexibility and protection provided by the sea base while minimizing the presence of the Marine air ground task force (MAGTF) ashore.

The challenge of Sea Basing is in its logistics sustainment concepts and the details of its implementation. A cornerstone of implementing Sea Basing is the Maritime Pre-positioning Force (MPF) and its future version, the MPF (Future).

MPF and MPF (Enhanced)

The MPF was established in 1979. It currently consists of 16 ships organized into 3 forward-deployed squadrons known as maritime pre-positioning ship squadrons (MPSRONs). MPF ships are privately owned and leased by the Department of Defense. They are capable of both container and roll-on-roll-off (RORO) operations.

Each legacy MPSRON consists of four or five ships and is loaded with pre-positioned weapons, equipment, and supplies sufficient to support a Marine expeditionary brigade (MEB)-sized MAGTF (approximately 17,000 marines) for up to 30 days. The MPSRONs are strategically located at Diego Garcia, Guam, and in the Mediterranean Sea. In a contingency, at least one MPSRON can arrive at a desired, sea-based location within 7 days of notification.

The Navy has pursued an MPF (Enhanced) program to add a ship to each MPSRON. An MPF (Enhanced) squadron will consist of five or six ships. The reason for this expansion is to create additional capacity in each MPSRON in order to embark naval mobile construction battalion ("Seabee") assets, a Navy fleet hospital, and an expeditionary airfield. All MPSRONs have received their extra ship and assets.

Current MPF Doctrine

Historical approaches to amphibious logistics support of assault forces, which required initial supply and then periodic resupply of water, rations, ammunition, and fuel, depended on the concept of the "beachhead." However, a beachhead support area stockpiled with all of the combat force's requirements created an attractive target for an enemy, one easily located and attacked.

Current MPF doctrine is to pre-position large caches of supplies and oversized equipment at strategic locations. A deploying joint force then is airlifted into a theater and received at an aerial port of debarkation. At the same time, the MPF ships loaded with the deploying force's equipment arrive at the sea port of debarkation (SPOD). These two actions are the "reception" phase of the reception, staging, onward movement, and integration (RSO&I) cycle. The joining of the deploying force with its equipment in marshalling areas near the SPOD is the "staging" phase. The "onward movement" phase is accomplished when the force departs the staging areas and moves to its assigned area of operations. The "integration" phase occurs when the combat force commander places the force in his order of battle. Sustainment of the deployed force begins once it is received and transported to its staging areas and continues until the campaign is completed.

The existing MPF provides mobility and limited in-stream offloading capabilities. Typical MPF operations require ports and airfields to offload cargo, which makes the deploying force potentially vulnerable to enemy attack. The MPF concept was tested and validated during Operation Desert Shield using a fixed port system. MPF ships provided the first heavy armor capabilities in that theater. During Desert Shield, the troops who initially deployed to the region depended on the supplies and equipment from the MPF ships. This materiel enabled U.S. forces to survive during the first critical weeks of the operation.

MPF (Future)

The MPF (Future) [MPF (F)] is similar to the current MPF in that it will be a grouping of ships strategically located around the world. Each MPF (F) squadron will be loaded with all of the equipment needed to support an MEB, and it will be able to transport that equipment anywhere in the world. The MPF (F) will include ships of several types rather than a group of ships of the same kind. The MPF (F) will perform four functions not performed by the existing MPF—

• At-sea arrival and assembly of units.

• Direct support of the assault echelon of an MAGTF.

• Indefinite sea-based sustainment of the landing force.

• At-sea reconstitution and redeployment of the force.

The MPF (F) will have the ability to unload its cargo in an improved port or over the beach in a joint logistics over-the-shore (JLOTS) operation. JLOTS is extremely important since most of the world's improved ports that are deep enough in draft to receive MPF (F) ships are located in industrialized countries, but most threats to the United States will occur in unimproved areas with no developed fixed-port system.

Under Sea Basing logistics concepts, the MPF (F) will support MAGTFs that are ashore executing the Marine Corps' STOM concept. Maintenance, repair, medical treatment, and supply operations will be conducted primarily from sea-based platforms. The MPF (F) will become, in essence, a floating warehouse for the forces deployed and operating afloat and ashore. The logistics infrastructure, supported by the MPF (F), will be maintained afloat and replenished in-stride from ships arriving on station from the continental United States (CONUS) or from support bases located nearer the operation. In effect, the MPF (F) will become a synonym for Sea Basing.

Future Sea Basing and MPF (F) Doctrine

Future Sea Basing and MPF (F) doctrine are comparable with current MPF doctrine. In each case, equipment and materiel will be pre-positioned in several places around the world. The difference is that the MPF (F) eliminates the requirement for access to secure ports and airfields. Most flashpoints in the future will be in the Third World. However, a plausible threat envisioned today (such as an asymmetrical threat) might not occur if the adversary understands that the United States can attack an area where no fixed ports exist. Most modern vessels are too big to enter most unimproved ports. But by using a platform at sea, the United States does not have to obtain permission from a foreign government to use a forward base or port. It will be able to take advantage of "Sovereignty of the Sea," the principal of international law that holds that the open sea (outside of a nation's territorial waters) cannot be appropriated or claimed by any single nation.

Sea-based operations will take advantage of the maneuver space provided by the sea. The ability to conduct RSO&I in a sea-based environment, far from an adversary's territory, also will provide added force protection. MPF (F) ships will be able to conduct at-sea arrival, assembly of units, and selective off-loading of equipment needed for the operation. Joint forces will meet the MPF (F) platforms while they are en route to the objective area. The MPF (F) will enhance the responsiveness of the joint team by assembling at sea an MEB or joint force that arrives by high-speed airlift or sealift from the United States or from advanced bases.

The MPF (F) combines the capacity and endurance of sealift with the speed of airlift to rapidly deploy MAGTFs to objective areas, and it adds the capability to provide indefinite sea-based sustainment. The accelerated deployment and employment times possible with MPF (F) will permit the projection of ground combat power within days rather than weeks or months. Efficient mating of Marine forces with their equipment will permit elements of the MPF (F) and MAGTF to arrive in the objective area integrated and prepared for operations. This is a significant advantage over traditional phased amphibious operations.

The MPF (F) will furnish an initial stock of war supplies for major ground combat operations. Once a ground force (a corps or larger) has been established ashore, the MPF (F) can remain in theater as floating warehouses, return to CONUS to serve as additional sealift, or reembark its equipment for staging in preparation for follow-on missions.

Use of the MPF (F) will increase force protection by using the sea as a buffer against an asymmetrical threat. The distance from shore will allow combatant vessels accompanying the MPF (F) to acquire and defeat incoming threats. The use of the MPF (F) in a sea-based support function will shift force protection concerns from the ships themselves to the transfer system required to ferry troops and supplies from the ships to the objective.

In an area of operations, the MPF (F) will provide a sea-based staging area and added maneuver space that will allow the joint force commander to execute the OMFTS and STOM concepts. The goal of OMFTS and STOM is to place a combat force in an adversary's rear area, where an attack will be least expected and the adversary least prepared. A symmetrical, or conventional, threat will protect its coastline and some strong points, or centers of gravity. But a threat cannot defend everywhere all of the time.

MPF (F) ships will be the platforms that sustain intheater logistics, communications, and medical capabilities. With no beach support area, logistics sustainment will move offshore to the MPF (F) and become the combat force's waterborne brigade support area (BSA). The BSA will shift from a linear battlefield and will be modified to effectively support the nonlinear battlefield envisioned in Sea Power 21. The MPF (F) will support not only the combat elements of an MAGTF, MEB, or joint task force (JTF) but also the combat support and combat service support elements assigned to it for direct support. The MPF (F) will be an integral part of the sea base, providing follow-on sustainment to maneuver forces ashore.

Needed MPF (F) Capabilities

The MPF (F) must be a part of the total force package and contribute to joint mission accomplishment in four areas: force closure, JTF interoperability, sustainment, and reconstitution and redeployment. Force closure is the process of joining Marine or joint forces deployed from CONUS with their equipment loaded onboard the ships of the MPF (F). JTF interoperability is the ability to reinforce the assault force of an MAGTF already committed to combat. [The MPF (F) will not be a combatant, and it will not have a forcible entry capability.] Sustainment of the assault force ashore requires the judicious use of combat service support resources. The MPF (F) must carry provisions to support an MEB ashore for 30 days and provide maintenance for all wheeled, tracked, and aviation assets supporting the Marine force. Reconstitution and redeployment of the force in the theater while at sea is required so that equipment stored aboard the MPF (F) can be employed in follow-on missions.

Research and development will be required to develop and integrate some new technologies to support the requirements of the MPF (F). Areas that will require further vision and innovation include—

- Selective onload and offload of cargo.
- Internal ship systems (such as automated warehousing; item, pallet, and container operations; RORO systems; and cargo flow patterns).
- External ship systems (such as ramps, lighterage, and other craft interfaces).
- Modular system and subsystem concepts (such as joint command and control modules and additional berthing modules).
- Aircraft interfaces for vertical replenishment and reception of deployed marines.
- An automated inventory management system that can receive, store, maintain, manage, and deploy the equipment and supplies required for sustained logistics support.

The MPF (F) will allow the logistics base to maneuver in an open sea. It will reduce double-handling of materiel by eliminating the need for shore-based logistics activities. The logistics support required to sustain the force ashore will be reduced, and the operational pause associated with setting up logistics support ashore will be eliminated. Selective offload of equipment and materiel will be the centerpiece of MPF (F)'s sea-based support.

In addition to operating over the horizon, the MPF (F) must be able to perform its offload mission in conditions up to sea state 3 [waves 1.4 to 2.9 feet high and winds 12 to 16 knots], perform essential ship functions up to sea state 5 [waves 6.4 to 9.6 feet high and waves 22 to 26 knots], and survive up to sea state 8 [waves 31 to 40 feet high and winds 42 to 46 knots]. It must also meet level I survivability requirements as defined in OPNAV [Office of the Chief of Naval Operations] Instruction 9070.1, Survivability Policy for Surface Ships of the U.S. Navy. Level I is the basic level of survivability for surface ships.

The MPF (F) must be able to reconfigure to accept the requirements of different task-organized missions. Logisticians will be required to set up an authorized stockage list (ASL) to support operations for a finite amount of time. They then must war-game different scenarios to ensure that the ASL is realistic and that it has a 10-percent overage of all stocks to compensate for any deficiencies in planning. This ASL will act like the warehousing function in a "just in time" supply environment. The capability to offload materiel selectively will become a necessity. With the MPF (F) as the warehouse, the transportation assets will serve as the just-in-time logistics facilitators.

MPF (F) Challenges

The MPF (F) faces several challenges that must be overcome before it becomes a reality. One will be its ability to function well with both legacy and future transportation systems. The bottom line is that the efficient use and implementation of the MPF (F) will depend on reliable and survivable high-speed transportation platforms to deliver logistics support. The reality is that legacy systems will be used as long as possible, but a smooth transition to future systems must be planned and will be expected.

Another challenge will be force protection. The MPF (F) will become the amphibious forces' center of gravity and will need to be protected at all costs. It will be the hub of all logistics support for combat forces conducting offensive operations in littoral regions. Combatant ships accompanying the MPF (F) will have to protect it with extreme vigilance. Navy leaders expect that future operations will be conducted in conjunction with the emerging concept of the Expeditionary Strike Group, with the Expeditionary Strike Group providing MPF (F) protection. If this protection is not provided, future combat forces ashore will find themselves deep in enemy territory with no supplies or beachhead to fall back on.

Artificial intelligence systems and expert systems will be required to provide just-in-time logistics in support of the smaller logistics footprint ashore. An expert system will allow logisticians to identify the location of the nearest supply item and its availability, order the item, and arrange the quickest and most cost-effective method for its delivery. An expert system also will automatically reorder supplies that were just removed from storage shelves, which will reduce manpower requirements by eliminating some of the clerical duties associated with restocking supplies.

An expert system will allow planners to run extensive logistics models in support of a landing force and determine the best possible logistics courses of action. A sea-based logistics expert system will reduce the time and manpower needed to support a forward-deployed unit. This will free up resources to increase combat power. The enhanced knowledge of in-transit inventories and total asset visibility provided by a logistics expert system will refine the allocation of transportation resources, improve item availability, and increase the velocity of materiel movement through the entire supply chain.

The MPF (F) is a great concept that is ready to blossom in conjunction with the Navy's Sea Basing and the Marine Corps' OMFTS concepts. The MPF (F) will interface with and use legacy and future aviation and amphibious assets. It will support Sea Power 21, Expeditionary Maneuver Warfare, OMFTS, and STOM. It will eliminate the need to depend on fixed forward logistics bases in questionable foreign areas and will provide the platform for force closure, JTF interoperability, sustainment, and reconstitution of the maneuver force for further missions.

The MPF (F) will capitalize on current and future technology and form the center of gravity of the maneuver force. By definition, it must be protected at all costs. All of the maneuver force's logistics will come from the MPF (F). Maneuver forces ashore may become untenable and reach a culmination point very rapidly without logistics support. Assaulting and taking the objective in OMFTS becomes the easy task. Keeping the troops alive on the objective becomes the intensely difficult assignment. The MPF (F) will be the string that ties Sea Power 21 and Sea Basing together into a coherent vision. **ALOG**

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The author thanks Commander Kevin F. Kelly, USN (Ret.), of Northrop Grumman Ship Systems, Research and Development, Advanced Ship Technology, for his assistance in writing this article.

Slingload Operations in Heavy Units

BY CAPTAIN JAMES OTIS

Slingload operations normally take a back seat in heavy operations, partly because heavy logistics units often do not have adequate slingload equipment and partly because their personnel are not sufficiently trained to use it. This situation denies the heavy unit the use of valuable lift assets.

During a Kosovo Peacekeeping Force rotation, I was the officer in charge of slingload operations for the sector. Working with both Army and Marine Corps aircrews, my team accomplished more than 50 missions for a variety of customers, including the French and Ukrainian armies. Our experience in Kosovo and other missions revealed a shortfall that has been demonstrated more recently on the noncontiguous, nonlinear battlefields of Iraq—the need for slingload operations in heavy units.

To be able to conduct successful slingload operations, a unit must focus on three critical factors: inspector certification, training, and equipment.

Inspector Certification

Properly rigged and inspected loads are crucial to mission success and to soldier and equipment safety. To be a certified slingload inspector, a soldier must have attained a minimum grade of E–4 and must have attended the Slingload Inspectors Certification Course, Air Assault School, or Pathfinder School. The Aerial Delivery and Field Services Department of the Army Quartermaster School at Fort Lee, Virginia, offers multitask trainer courses to train companies, battalions, or brigades.

It is important to remember that rigging and inspector certification are both perishable skills. A soldier who has not inspected a load in 18 months cannot be expected to work as fast or as accurately as a soldier who conducts inspections every month. A soldier who has not inspected a load in a long time also is more likely to make errors, which increases the chances of injury or loss of equipment.

Sustainment training should be conducted quarterly, and rehearsals should be held before all missions. Commanders who understand slingload principles will ensure that the proper amount of time is allotted for training and preparing for slingload missions.

Training

Training for slingload operations is a relatively simple process. The basics can be taught to an uncertified rigging team in 1 day. Training that focuses on specific loads can be taught in a single follow-up class.

One of the most important fundamentals of rigging equipment correctly is opening the book. The field

An uparmored high-mobility, multipurpose, wheeled vehicle (HMMWV) is hooked to a CH–47 Chinook helicopter in preparation for liftoff.

manuals (FMs) that pertain to slingload operations are—

• FM 10–450–3, Multiservice Helicopter Sling Load: Basic Operations and Equipment.

• FM 10–450–4, Multiservice Helicopter Sling Load: Single-Point Rigging Procedures.

• FM 10–450–5, Multiservice Helicopter Sling Load: Dual-Point Load Rigging Procedures.

These manuals should be available to rigging teams at all times. Although this may seem obvious, many soldiers try to rig loads from memory, which can have dangerous consequences.

Other important considerations are *who* is trained and *what* is trained. Soldiers in supply platoons, fuel and ammunition platoons, transportation platoons, and even the maintenance platoons of various combat service support companies should be trained to support slingload missions. Having more trained soldiers gives a commander more flexibility in planning and carrying out successful slingload operations.

A well-developed standing operating procedure (SOP) is an important tool for teaching proper slingload procedures. It will answer a lot of questions before they are even asked and help to identify problems and pitfalls.

The author completes paperwork for cargo to be transported by a CH–47 Chinook helicopter.

Equipment

Currently, there are no slingload unit basic load recommendations for heavy units. For training purposes, a unit should have the following equipment: a 5,000- or 10,000-pound sling net, a 10,000- or 25,000-pound sling set, and a static discharge wand. This minimum amount of equipment will allow the soldiers to train with most basic loads.

To be fully operational, a slingload unit should have a much larger inventory that includes ten 5,000- or 10,000-pound sling nets, ten 10,000- or 25,000-pound sling sets, two static discharge wands, and two 25,000-pound reach pendants. With this equipment, a unit can conduct most certified slingload missions. While it may be tempting to mix the sling net and sling set sizes to save money, the additional cost of purchasing 10,000-pound sling nets and 25,000-pound sling sets is more than offset by the increased functionality.

Unit and Aircrew Cooperation

In order to conduct successful slingload missions, a good working relationship must exist between the slingload unit and the air assets in the division. The division air liaison officer (ALO) can help identify and meet the unit's needs. By establishing a cooperative relationship with the ALO early, the unit can gain valuable experience in evaluating factors such as weather and elevation when planning slingload operations.

Through the ALO, the slingload unit also should establish a good working relationship with the supporting aviation unit. This relationship will help identify the problems and needs of the pilots and the aircraft they use and foster trust between the two units. Pilots are not required to accept cargo that slingload units rig for them, so it is important to build trust and credibility between the two units in order to accomplish the mission successfully.

The Helicopter of Choice

From a logistician's standpoint, the CH–47 Chinook helicopter is the aircraft of choice for slingload operations. Its heavy-lift capability is three times greater than that of the UH–60 Black Hawk. The CH–47's increased lift capacity and its single- and dual-point cargo hook options make it the most effective tool in the Army for slingload operations.

Heavy units must understand that they have a vital, often overlooked tool at their disposal—slingload. It is important that they learn how to use it effectively in providing combat service support to warfighters. **ALOG**

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COMMENTARY

Insights Gained Through An Army G–4 Internship

BY CADET ALEXANDRA E.H. WEISKOPF

An Army ROTC cadet describes how an internship with the Army G–4 influenced her perception of Army logistics and her role as an officer.

Last summer, after completing the Reserve Officer Training Corps (ROTC) National Advanced Leadership Camp at Fort Lewis, Washington, I served as an intern with the Army G–4 at the Pentagon. This proved to be a true learning experience, giving me the opportunity to gain a depth of knowledge about Army logistics that I may not have achieved otherwise. Before working as an intern in the Army G–4, I did not have a desire to be a logistician or to study logistics. During the 3 weeks I was there, my desire to be a logistician did not increase. However, my superiors in the G–4 Plans and Readiness Division helped me to gain an appreciation for logistics and its role in the Army.

The most valuable lesson I learned during my time as an Army cadet intern was that, although you might not always like your job, the way you value it makes all the difference. I valued my time in G–4, and I learned a tremendous amount. Thus, my experience was extremely successful. When Secretary of Defense Donald H. Rumsfeld spoke to the Pentagon interns, he said, "It is less important what you're doing than if you believe it's important. . . . If you get stuck in something you don't feel is worth doing, you won't give as much of yourself."

Early in my assignment in G–4, I saw the importance of plans and readiness, so I immersed myself in my work. I asked many questions and used my analytical skills to try to piece together logistics at the strategic level so I could understand it better at the tactical level. I worked with Army strategic readiness updates, helping action officers gather and analyze the data needed to brief the Chief of Staff of the Army. I also worked with unit status reports and analyzed commanders' subjective ratings of their units' readiness. I was briefed on the Strategic Readiness System as well as the SSN–LIN (standard study number and line item number) Automated Management and Integrating System. I attended briefings about joint logistics war games and briefings concerning contractors on the battlefield.

On my first day, I had the opportunity to meet with Lieutenant General Charles S. Mahan, who was the G–4. General Mahan helped me to understand Army logistics. At the Pentagon intern meeting with Secretary Rumsfeld, I gained an overall picture of the Department of Defense. General Mahan, Secretary Rumsfeld, and my military advisors shared one common characteristic: interest in my development into a leader. All of these people took the time to address my potential as a future leader in the Army. They not only shared anecdotes about their lives but also imparted wisdom about leading the best and brightest soldiers America has ever had. The mentoring that each of these people took the time to provide to me is an example I will follow during my career as an officer.

With an English and communications background, I may have been more suited to work in media relations or public affairs. However, working in an area I was not passionate about forced me to focus on the task without being caught up in the glamour of the job. Working in a field in which I had no prior experience

"My visit to the White House showed me just how different life has become since 11 September 2001."

also forced me to humble myself and learn. I had to ask many questions and look up the small details of the job. I spent hours on the acronym finder while reading Army Regulation 220–1, Unit Status Reporting. However, in 3 weeks I was able to grasp the basics of Army logistics at the strategic level.

In addition to my G–4 experience, working in the Pentagon helped me to understand just how big the "big picture" is, giving me a bird's eye view of the Department of Defense. One of the first lessons I learned is that "the buck stops here." The men and women who worked around me were responsible not only for collecting information but also for analyzing it in order to help the senior Army leaders to make decisions. I feel very lucky to have been surrounded by such talented and experienced individuals, and I have confidence in the decisions they make—decisions that will affect the soldiers I will lead.

A piece of advice that Secretary Rumsfeld offered will stick with me long after my internship. When asked what he would have done differently in his career, Secretary Rumsfeld said that he would have fired some individuals sooner. His advice points to an important leadership lesson that is understood at the most basic level: when in control, be in control; when a leader, make a decision. Throughout my Army ROTC training, I have been taught to make a decision—right or wrong—and stick to it. Secretary Rumsfeld confirmed this for me. He pointed out that a leader needs to surround himself with others who share his vision; a leader who does this equips himself for success.

Visiting locations outside the G–4, such as the Defense Logistics Agency, the Army Operations Center, and the Joint Logistics Operations Center, and going to meetings at the Presidential Towers taught me that many people work in defense of our Nation, not just those in uniform or those who work at the Pentagon. Overall, thousands of military and civilian personnel work to support the Department of Defense. Seeing so many civilians working at the Pentagon showed me that the civilians supporting our military are highly intelligent and that they are just as qualified as the military personnel are.

My visit to the White House showed me just how different life has become since 11 September 2001. I was told that Chap Stick could be a biological agent, that tissues could be a chemical agent, and that I could not take any electronic devices, such as pagers, or cameras into the building. Since I grew up in the Washington, D.C., metropolitan area, I was accustomed to walking in and out of the Smithsonian museums and other tourist attractions. When I was a child, my family would sign up for a tour, show up at the designated time, and wander around the White House. Now visitors are restricted to one hallway of one wing. I was able to look into about five rooms and had to leave after 40 minutes.

Finally, giving a briefing on contractors on the battlefield taught me that professionalism and image are paramount, that preparation is key, and that many senior leaders like to offer their insights. Since my experience with briefings was limited to the classroom—where those being briefed did not interact with the briefer—I was surprised at the ease with which members of my briefing audience spoke up, added comments, and posed questions to me and to each other during my briefing. While this was jarring, I soon realized that my briefing was sparking conversation and maybe even affecting policy change. I learned a lot from my audience and began to understand that those in attendance had a lot to offer me both professionally and personally.

Being surrounded by so many high-ranking personnel at the Pentagon was a humbling experience, especially since I have no real military experience. I garnered a lot of good advice about the different branches of the Army, military life, duty stations, and professional development. Most importantly, I learned about the things military leadership books and branch Web sites do not tell you. I heard what it was like to have a family, to not have a family, to have children when young, to have children when older, to deploy and leave a family behind, and to make a 20-year-old career and a 20-year-old marriage work simultaneously. More important than any lesson I learned about Army logistics, I learned that being in the military is a marriage—not between you and your branch of service but between you and those who support you.

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Distribution Process Owner Initiatives Are Underway

BY REAR ADMIRAL CHRISTOPHER C. AMES, USN

The U.S. Transportation Command's new role as the Department of Defense's Distribution Process Owner is becoming a reality.

The designation of the U.S. Transportation Command (USTRANSCOM) as the Department of Defense's (DOD's) Distribution Process Owner (DPO) in September 2003 began a series of unprecedented actions to transform the way DOD supports its warfighters.

Only months after Secretary of Defense Donald H. Rumsfeld ordered authority and accountability for end-to-end DOD distribution placed under a single combatant commander, USTRANSCOM combined existing structure and associated personnel to form a Deployment and Distribution Center (DDOC). In January, the DDOC deployed a pilot group of about 65 of those experts to the U.S. Central Command (USCENTCOM), where they now serve under the control of the USCENTCOM commander. Staffed with representatives from the Defense Logistics Agency, the Army's Surface Deployment and Distribution Command, the Air Force's Air Mobility Command, the Navy's Military Sealift Command, the Army's Joint Munitions Command, and the services' respective logistics commands, this team is directing air and surface distribution operations in theater.

The DDOC-Forward, by plugging USCENTCOM directly into USTRANSCOM's material and transportation management systems and information technology, has achieved early successes in facilitating key inter- and intratheater movements, "end-to-end" throughput, and total visibility in the factory-to-foxhole pipeline for which USTRANSCOM is now responsible. Ongoing evaluations will refine those processes.

Distribution Transformation Task Force

Along with the deployment of the DDOC-Forward, USTRANSCOM continued building on its collaborative relationships with industry partners, Federal agencies, and the services by creating an "all-star" team of logistics professionals to plan, evaluate, and coordinate DPO initiatives. This team, the Distribution Transformation Task Force (DTTF), includes senior military logisticians from the Office of the Secretary of Defense, the Joint Chiefs of Staff, the services, the combatant commands, and Defense agencies. The task force's focus is on improving speed, reliability, and efficiency.

During its inaugural meeting in December 2003, the DTTF sanctioned immediate pursuit of several top DPO initiatives, including—

- Distribution and Deployment Processes.
- Billing, Funding, and Budget Processes.
- End to End (E2E) Distribution Architecture.
- Direct Vendor Delivery Processes.
- Radio Frequency Identification.
- Supply and Transportation Priority System.
- Time Definite Delivery.

Focused integrated process teams (IPTs) led by several distribution partners have been formed for each of these initiatives. Here is an update on the status of four initiatives.

Billing, Funding, and Budget Processes

Because the current financial system is fragmented and disjointed, the Billing, Funding, and Budget Processes initiative seeks to improve and standardize key distribution financial processes. Customer feedback is clear: The billing process is too complex, and DOD's distribution community needs a simpler process for billing. The goal is a single, end-to-end bill. The IPT has mapped the various billing processes and identified one area in which to test the concept of a single bill. This test will focus on the movement of reparable items by air from overseas locations back to the United States and then by surface transportation directly to the repair facility, with all transactions along the way billed on a single bill.

E2E Distribution Architecture

DOD currently lacks a defined, integrated E2E Distribution Architecture, which is needed to provide a framework for improving distribution performance. Development of this architecture is a key DPO initiative. Establishment of a desired E2E distribution process and associated data exchange requirements is needed to drive the development of the systems architecture and supporting IT requirements. Future IT decisions will be the basis for increased integration, interoperability, and IT capability requirements.

The IPT has finished its review of the approximately 200 distribution-related systems that constitute the current capability. The team selected class V (ammunition) as a model on which to develop a standard methodology for examining the E2E distribution architecture. E2E distribution starts with the DOD source of supply and ends with material being received by the unit placing the order. The next task under this initiative will be establishing process business rules for guiding the development of the distribution architecture.

Direct Vendor Delivery Processes

A third DPO initiative is Direct Vendor Delivery Processes. Vendors frequently deliver cargo to DOD distribution nodes without proper documentation and with insufficient information about the ultimate recipient of the cargo. Valuable time is lost in tracking down information required to move the cargo on to the customer. In many cases, the material was ordered with a Government Purchase Card (GPC). Vendors do not have the means to determine the correct shipping instructions or to produce a military shipping label.

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Ongoing efforts to resolve these issues include establishing a Web-based tool that permits GPC holders to place orders on line and allows vendors to automatically print required shipping labels and ship-to instructions. The system could be linked to various cargo routing files to ensure that vendors ship to customers' current shipping addresses. To the maximum extent possible, this capability will be a commercial off-the-shelf product requiring minimal changes to implement within DOD.

Time Definite Delivery

The overarching goal of the Time Definite Delivery (TDD) initiative is to achieve consistent, reliable distribution service to the customer—distribution service that is predictable and can be counted on. TDD's measurement of success is consistent distribution of cargo to the warfighter in timeframes mutually agreed on by the customers and the distribution process providers. For forward distribution to customers outside the continental United States, TDD will be achieved through the collaborative efforts of the Defense Logistics Agency, the services, USTRANSCOM, and each receiving theater commander. The concept underlying TDD is building customer confidence and assurance in the distribution system, thereby relieving the tendency of customers to submit duplicate orders or increase requisition priorities in order to "game" the distribution system.

The TDD IPT is focusing on the European and Pacific theaters for initial implementation of the TDD program. Several U.S. European Command and U.S. Pacific Command distribution lanes have been identified, and TDD time thresholds are being examined for each line. The end state will be a process that provides on-time distribution—delivery that is neither early nor late.

These actions are only a snapshot of the work needed to achieve real improvements in the overall efficiency and interoperability of DOD's current distribution process. Achieving these improvements is the responsibility of the newly designated DPO.

The DPO—a watershed development in Defense logistics management—is engaging the full range of distribution partners in industry, DOD, and other Federal agencies. Its work involves all who are interested in efficient transportation, logistics, and distribution. Its creation appeals to all who would help provide a seamless, synchronized distribution process for our warfighters. **ALOG**

Rear Admiral Christopher C. Ames, USN, is the Director of Strategy, Plans, Policy, and Programs (J–5) at the U.S. Transportation Command at Scott Air Fore Base, Illinois. A naval aviator, he has a B.S. degree from the U.S. Naval Academy and a M.P.A. degree from the John F. Kennedy School of Government at Harvard University. Before his current assignment, Admiral Ames was commander of Amphibious Squadron Three.

ALOG NEWS

(continued from page 1)

JOINT NATIONAL TRAINING CAPABILITY COMPLETES INITIAL EXERCISE

The Department of Defense conducted the first exercise under its new Joint National Training Capability (JNTC) concept in January. Over 9,400 service members participated in the exercise, called the Western Range Complex JNTC Horizontal Training Event 04–1, with personnel from the U.S. Joint Forces Command (USJFCOM) providing exercise control.

USJFCOM is developing the JNTC to meet the need for the armed services to train as they will fight, which means as components of joint task forces. As Dr. Paul W. Mayberry, the Deputy Under Secretary of Defense for Readiness, explained the rationale behind the JNTC, "We fight as a joint team. We must train routinely in a joint environment."

The JNTC is designed to provide that joint training environment. The original JNTC concept was to establish a Joint National Training Center, a physical location where the services would train together as joint task forces. However, that concept evolved into the current plan, which is to create a networked joint training environment that brings together live exercises and virtual (manned simulators) and constructive (computer simulations) training events.

The JNTC will have four training methods—

• Horizontal, which synchronizes training at the service-to-service level.

• Vertical, which coordinates training of a service branch with a higher component and a lower service branch.

• Integration, in which participants train in a joint context to improve interoperability.

• Functional, which provides a joint training environment for functional and complex warfighting.

The first JNTC exercise integrated an Army rotation at the National Training Center at Fort Irwin, California; an Air Force Air Warrior exercise at Nellis Air Force Base, Nevada; a Marine Corps combined arms exercise at the Marine Corps Air Ground Combat Center at Twentynine Palms, California; and a Navy surface-launched attack missile exercise (SLAMEX) conducted from ships anchored at San Diego, California. Participants at 12 other locations were linked to the exercise through simulators and simulations.

Other exercises scheduled for this year include an integration event, Combined Joint Task Force Exercise 04–2, in June; another horizontal exercise in August; and a vertical exercise, Unified Endeavor/ Fuertes Defensas 04, in September.

JNTC should achieve initial operating capability by October and final operating capability by fiscal year 2009.

ARMY BUDGET SUBMITTED TO CONGRESS

The President is seeking $98.526 billion for the Army in his fiscal year 2005 budget, an increase of about $4.6 billion (or 4.7 percent) over what he sought and $2.7 billion (or 2.8 percent) over what Congress appropriated for fiscal year 2004. (These figures do not include fiscal year 2004 supplemental appropriations of approximately $38.7 billion for the Global War on Terrorism or planned fiscal year 2005 supplemental requests.) The Army request constitutes 24.5 percent of the overall Department of Defense budget of $401.7 billion.

The fiscal year 2005 budget proposal includes $39.408 billion for military personnel; $32.573 billion for operation and maintenance; $10.364 billion for procurement; $10.435 billion for research, development, test, and evaluation; $2.124 billion for military construction; $1.565 billion for family housing; and $1.372 billion for chemical demilitarization.

The budget begins a long-term process of rebalancing types of units within the Active and Reserve components. To reduce the current, war-driven burden on the Reserve components, the Army in fiscal year 2005 will convert 2,184 Active component personnel spaces from units in less demand (such as air defense) to those in greater demand (such as transportation and quartermaster). The Army also will pursue conversion of military spaces to civilian positions where appropriate.

The operation and maintenance request will fund Active component operating tempo at 899 miles of actual and virtual use for each vehicle and 13.1 hours of flying each month for each aircrew. The budget will support 10 brigade rotations (1 Army National Guard) at both the National Training Center and the Joint Readiness Training Center; 5 brigade rotations at the Combat Maneuver Training Center; and 1 corps-level Warfighter exercise and training for 11 division-level command and staff groups in the Battle Command Training Program.

The Depot Maintenance Program will be funded at

72 percent of its requirements, and the Recapitalization Rebuild Program will be fully funded to support the 17 designated systems. The budget request also will support an initiative called "Connect Army Logisticians," under which existing information systems will be redesigned to provide continuous connectivity from soldiers on the battlefield to the domestic industrial base.

The procurement requests include $1.831 billion for aircraft (down 14.3 percent); $1.305 billion for missiles (down 12.7 percent); $1.640 billion for weapons and tracked combat vehicles (down 15.7 percent); $1.402 billion for ammunition (up 1.7 percent); and $2.283 billion for other procurement (down 21.9 percent). This last category will fund the purchase of 2,425 trucks in the family of medium tactical vehicles—an increase of 630—and 818 uparmored high-mobility, multipurpose, wheeled vehicles.

The budget provides for the acquisition of 310 Stryker vehicles to support conversion of the fifth Stryker brigade, the 2d Brigade, 25th Infantry Division (Light), at Schofield Barracks, Hawaii. It also calls for spending $3.198 billion on research, development, and acquisition for the Future Combat Systems, the keystone of the Army's Future Force.

The chemical demilitarization program will continue design and construction of planned disposal facilities at Lexington, Kentucky; and Pueblo, Colorado; and environmental monitoring at the closed Johnston Atoll facility, as well as ongoing disposal operations at the facilities at Aberdeen Proving Ground, Maryland; Newport, Indiana; Anniston, Alabama; Pine Bluff, Arkansas; Tooele, Utah; and Umatilla, Oregon.

FIELD STUDY IN AFGHANISTAN FINDS NEED FOR LIGHTER COMBAT LOADS

A study of the combat loads carried by 82d Airborne Division soldiers in Afghanistan found that the loads were too heavy. The study—evidently the first study of battlefield combat loads since one conducted by the Marine Corps in 1942—was sponsored by the Center for Army Lessons Learned at Fort Leavenworth, Kansas, and led by Lieutenant Colonel Charles Dean, the Army's liaison to the Institute for Soldier Nanotechnologies at the Massachusetts Institute of Technology.

Field Manual 21–18, Foot Marches, which was issued in 1990, set the maximum weights that soldiers should carry as combat loads—

The 82d Airborne Division's Task Force Pathfinder is using several new vehicles to detect buried mines and improvised explosive devices (IEDs) in Iraq. The vehicles are heavily armored and designed to resist the blast of IEDs and mines, freeing the operators to focus on finding the explosive devices. Above, a vehicle operator dismounts an RG–31 armored car that was manufactured in South Africa.

• Fighting load: 48 pounds. (A fighting load includes a weapon, bayonet, clothing, helmet, load-bearing equipment, and ammunition.)

• Approach march load: 72 pounds. (This load adds a lightly loaded rucksack.)

• Emergency approach march load: 120 to 150 pounds. (This load adds a larger rucksack.)

The average soldier in the study carried a fighting load of 63 pounds, or 36 percent of the average soldier's body weight of 175 pounds, before a rucksack was added. The average approach march load was 96 pounds, or 55 percent of average body weight. The emergency approach march load averaged 127 pounds, or 73 percent of average body weight.

The study found that—

• Soldiers have greater capabilities, but the increase in capabilities has increased the weight soldiers must carry.

• Less essential items now carried by soldiers should be carried in vehicles.

• Body armor should be lighter.

• Load carriage needs to be improved.

• Climate and terrain can exhaust soldiers carrying heavy loads. In Afghanistan, for example, daytime temperatures during the period of the study (springtime) reached 116 degrees Fahrenheit and nighttime temperatures were frigid.

Dean concluded, "I think we can drop 10, 20, 30 pounds off these guys by paring down some items that they are currently carrying, as long as these items are readily available when needed in a hurry. If we can offload some items, then we can work on reducing the weight of the remaining items through technology. The big monkey is to look at logistics and redesign logistics practices to get the weight off soldiers."

ARMY NAMES ITS NETWORK ENTERPRISE

In February, the Army announced a new name for its network enterprise. "LandWarNet" is the Army's share of the Department of Defense's (DOD's) Global Information Grid (GIG). It provides networks to the Active Army, Army National Guard, Army Reserve, and the sustaining base (the people, guidance, systems, money, materiel, and facilities that prepare soldiers for action, take care of their families while they are deployed, and return the soldiers to their installations.) LandWarNet is the Army counterpart to the Air Force's ConstellationNet and the Navy's enterprise network of the FORCENet.

LandWarNet combines infostructure (information + infrastructure) and services across the Army. It processes, stores, and transports information over a seamless network.

LandWarNet's network elements consist of—

• Installation connectivity to the GIG. The National Guard's GuardNET and the Army Reserve's ARNET are both part of LandWarNet at this level.

• Echelons-above-corps connectivity to the GIG. This element supports combatant commanders, land component commanders, and joint force commanders and is the bridge between the deployed soldier and the GIG.

• Echelons-corps-and-below connectivity to the GIG. This element supports soldiers, units of action or brigade, division, and corps elements located in the deployed theater.

As they are fielded, the Warfighter Information Network-Tactical (WIN–T), Joint Tactical Radio System, Transformational Communications System, GIG-bandwidth expansion, and network-centric enterprise services will be integral parts of LandWarNet.

The GIG is the globally interconnected set of information capabilities, associated processes, and personnel that collect, process, store, disseminate, and manage information for warfighters, policy makers, and support personnel. It comprises all DOD-owned and DOD-leased communications and computing systems and services, software, data, security services, and other associated services necessary to achieve information superiority.

The GIG supports all DOD, national security, and related intelligence community missions and functions (strategic, operational, tactical, and business), in war and peace. It provides capabilities from all operating locations (bases, posts, camps, stations, facilities, mobile platforms, and deployed sites) and enables interfaces among coalition, allied, and non-DOD users and systems.

FLORIDA TECH ANNOUNCES ALMC FELLOWSHIP

The Florida Institute of Technology (FT), which has a graduate center on the campus of the Army Logistics Management College (ALMC) at Fort Lee, Virginia, has announced the establishment of the ALMC Logistics Executive Development Course (LEDC)/FT Endowed Fellowship. The fellowship was established with a $10,000 anonymous gift in memory of Major Mathew Earl Schram, a graduate of the LEDC/FT cooperative degree program who was killed in Iraq last year.

Under the provisions of the fellowship, tuition assistance will be provided to U.S. military officers in the LEDC/FT cooperative degree program who qualify based on merit and need. The recipient will receive tuition assistance during his final semester in the LEDC/FT program and appropriate recognition on graduation from the program. The first fellowship will be awarded this fall.

For more information on the fellowship or to make a donation to the fund, call FT at (804) 765–4665 or send an email to peter.j.adler/FIT@lee.army.mil.

ANNUAL SOLE CONFERENCE SCHEDULED

SOLE—The International Society of Logistics, will hold its 39th Annual International Conference and Exhibition 31 August to 2 September at the Norfolk Waterside Marriott in Norfolk, Virginia. This year's theme is "Future Logistics: The Integrated Enterprise." For more information, visit the SOLE Web site at www.sole.org/conference.asp or send an email to AnnualConf@sole.org.

ALMC Celebrates

50TH ANNIVERSARY

The Army Logistics Management College (ALMC) at Fort Lee, Virginia, is celebrating its 50th anniversary this year with a series of events and commemorations.

Scheduled events include—

- **1 July**—Kickoff Program, community reception, exhibits, and seminars. The guest speaker will be Representative J. Randy Forbes of Virginia.
- **15 July**—Staff, Faculty, Retirees, Alumni Luncheon at the Regimental Club, Fort Lee. The guest speaker will be Colonel Robert C. Barrett, USA (Ret.), who was the Commandant of ALMC from 1986 to 1987.
- **30 July**—Dinner Dance at the Lee Club, Fort Lee.

For more information, call (804)765–4612 or send an email to martind@lee.army.mil.

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Coming in Future Issues—

- **Fueling the Force at the JRTC**
- **Logistics Transformation of the Army Oil Analysis Program**
- **The Iron Mountain**
- **A View From the Rear With an Eye to the Future**
- **Corps Support Forward of the Division Boundary**
- **The Aviation Support Battalion: Workhorse of Army Aviation**
- **Planning a CSS Live-Fire Exercise in Korea**
- **Moving the Army—Texas Style**
- **Supporting the Fight: The FSB**
- **Names, Nomenclatures, and Numbers**

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