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Focused Logistics

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PROFESSIONAL BULLETIN OF UNITED STATES ARMY LOGISTICS

Cover: The article starting on page 2 concludes our series on the Focused Logistics Campaign Plan—the guide to transformation of Department of Defense logistics. The photos on the cover (starting in the upper left) portray recent activities in four of the areas the plan identifies for action: joint deployment/rapid distribution (a UH–60 Black Hawk helicopter is offloaded from a C–5 transport); information fusion (an Air Force officer provides air control in Iraq); force health protection (an Air Force flight nurse checks a patient); and agile sustainment (the Navy resupplies a combat ship at sea).

ALOG NEWS

KEYSTONE CSS MANUAL PUBLISHED

The Army's keystone field manual (FM) for combat service support (CSS), FM 4–0, Combat Service Support, was published in August 2003. The new FM, which replaces FM 100–10, was written by its proponent, the Army Combined Arms Support Command at Fort Lee, Virginia. It was written to complement FM 3–0, Operations, to ensure that Army operational and CSS doctrine are completely integrated and supportive of Army full-spectrum operations. Unlike FM 100–10, FM 4–0 goes beyond tactical-level discussions to include strategic- and operational-level CSS and links Army CSS doctrine with joint logistics doctrine.

FM 4–0 supports Army combat support (CS) and CSS transformation by serving as transitional doctrine between the Army's current force and the emerging future force, such as CSS to Stryker Brigade Combat Teams. It codifies new CSS doctrine, including CSS reach operations, reduced CSS footprint, intermediate staging bases, split-based operations, and CSS information systems. By incorporating chapters covering each of the CSS proponent and functional areas, the manual links directly to subordinate CSS doctrinal manuals.

FM 4–0 is available on the Reimer Digital Library. Distribution of hard copies began in October.

ARMY APPROVES MORE BUSINESS PROCESS IMPROVEMENTS

The Secretary of the Army has approved 16 initiatives submitted to him by the Army Business Initiative Council, 9 for implementation by the Army and 7 to be forwarded to the Department of Defense (DOD) Business Initiative Council for possible DOD adoption. This was the fifth round of Army Business Initiative Council recommendations, with a total of 66 initiatives approved by the Secretary for Army or DOD action.

Among the initiatives approved for Army implementation are the following—

• Promoting the use of standardized and rechargeable batteries. This will help meet the increasing Army demand for portable power at a time when industrial production of military-unique

Soldiers at the Theater Distribution Center (TDC) near Camp Doha, Kuwait, check cargo to be sure it is securely loaded for transport. Soldiers and civilians at the TDC provide critical supplies to the soldiers in Iraq. TDC personnel ship an average of 4,200 vehicles of cargo each month, including up to 1,700 containers, to the troops who need them.

batteries is declining.

• Including a waiver clause in all Army regulations, instructions, and memoranda. This initiative will allow commanders and managers to seek waivers from the Army proponent.

• Standardizing parts throughout the logistics system. The initial focus of this initiative will be the eight types of trailers in the Army inventory. Using common parts in Army trailers will cut costs, save manpower, reduce the logistics footprint, and simplify sustainment.

• Creating an object-based Army publications system. The result of this initiative will be a central, Web-based repository of topics drawn from the Army's thousands of publications, which duplicate a great deal of information.

• Improving initial environmental site investigations. This initiative will create better ways of gathering and integrating environmental information on Army sites.

• Establishing a ground systems industrial enterprise. The enterprise will seek changes in how depots operate to increase their efficiency and flexibility.

The initiatives recommended for DOD consideration include—

• Reducing the time needed to activate SIPRNet (Secure Internet Protocol Router Network). The time between a request for a SIPRNet connection

Implementing Focused Logistics

Developing the logistics for full-spectrum dominance requires progress in seven areas and vigorous experimentation.

In the multipolar world that has emerged since the end of the Cold War, the goal of the Department of Defense (DOD) is to attain full-spectrum dominance. This means the ability to deter or defeat any potential enemy across the entire range of possible contingencies. To achieve full-spectrum dominance, the U.S. military has entered a period of basic transformation that takes advantage of new technologies and business practices. That transformation extends to logistics through the concept known as focused logistics.

According to DOD's roadmap to focused logistics, the Focused Logistics Campaign Plan—

> Focused Logistics means doing logistics right . . . [by providing] the future joint warfighter [with] the right personnel, equipment, supplies, and support in the right place, at the right time, and in the right quantities across the full spectrum of military operations.

Focused logistics will provide full-spectrum support to warfighters in an increasingly joint, interagency, and multinational (JIM) operational environment.

Previous *Army Logistician* articles on the Focused Logistics Campaign Plan described the background behind focused logistics (July–August 2003) and the "building blocks" of focused logistics, Logistics Transformation and the Future Logistics Enterprise (September–October 2003). This article discusses seven initiatives that together are making focused logistics a reality: joint deployment/rapid distribution, joint theater logistics management, agile sustainment, operational engineering, information fusion, multinational logistics, and force health protection.

Joint Deployment/Rapid Distribution

To a considerable degree, full-spectrum dominance depends on better transportation—on the ability to move people and materiel to where they are needed with greater precision and speed than ever before. This capability requires both improved mobility and more efficient deployment and distribution processes. The result will be a system that brings deployment and distribution together to share a common pipeline and the same multimodal transportation.

DOD's strategy for improving deployment and distribution includes revising doctrine, reengineering processes, developing interoperable systems, and enhancing mobility assets. To implement this strategy, DOD has—

• Designated the commander of the U.S. Joint Forces Command (USJFCOM) as the joint deployment process owner for DOD. This is a significant development, because, in the words of the campaign plan, it is the first time that DOD has given one organization "the authority and responsibility to lead change across an entire corporate process."

• Included deployment and redeployment and distribution in the Joint Operational Architecture needed to realize the goals of Joint Vision 2020.

• Developed the Transportation Coordinators Automated Information for Movement System II (TC–AIMS II) and Joint Forces Requirements Generator II (JFRG II). These systems capture unit movement data for use at the operational and strategic levels.

• Completed the Mobility Requirements Study—2005. This study found shortfalls in the continental United States transportation infrastructure, strategic and intratheater airlift, and pre-positioning. According to the Focused Logistics Campaign Plan, the findings of the Mobility Requirements Study, including the need for a minimum airlift capability of 54.5 million ton-miles a day, provide "a common baseline for funding future lift requirements."

DOD is taking steps to improve the triad of airlift, sealift, and pre-positioning. To improve airlift, DOD is acquiring 180 C–17 transports; upgrading C–5 transports to boost their mission-capable rates from 65.8 percent to a goal of 76 percent; and seeking congressional approval to lease 100 Boeing 767 tanker aircraft to increase aerial refueling capabilities.

In the sealift and pre-positioning areas, the Navy has acquired 20 large, medium-speed, roll-on-roll-off ships; 11 will be used for surge sealift, 8 will be dedicated to the Army pre-positioning afloat program, and 1 will be used by the Marine Corps. The Army and

Navy also are working on an initiative to improve joint logistics-over-the-shore operations so they can be conducted in sea state 3 conditions (waves 3.5 to 5 feet and winds 13.5 to 16.4 knots).

For the future, DOD is investigating the use of intermediate staging and support bases, either afloat or ashore but outside the battlespace, that may reduce the logistics footprint in the battlespace.

Joint Theater Logistics Management

DOD's concept of joint theater logistics management will provide joint force commanders with visualization and decision-support tools so they can manage logistics effectively throughout the full spectrum of operations. According to the campaign plan, the joint force commander must have "the ability to synchronize, prioritize, direct, integrate, and coordinate common-user and cross-service logistics functions." DOD's goal is to link logisticians and operators in combatant commands and joint task forces (JTFs) with their counterparts in the services and with partners in other agencies and multinational coalitions.

The Global Combat Support System (GCSS) (Combatant Command/JTF) will be the joint theater logistics management module of GCSS. Combatant commanders have identified 129 information requirements for the logistics functions of supply, maintenance, transportation, healthcare, personnel, engineering, finance, and acquisition. GCSS (Combatant Command/JTF) will link GCSS with service and agency logistics systems and will provide combatant command and JTF personnel with access to logistics information needed for making decisions.

Guidance on joint theater logistics management has been added to Joint Publication 4–0, Doctrine for Logistic Support of Joint Operations. Under this guidance, the combatant commander will be able to choose the right logistics management organizational structure for his area of responsibility and mission from several options. These options include—

• Using a service support organization as a logistics nucleus.

• Augmenting the combatant command's J–4.

• Delegating responsibility for joint theater logistics management to a JTF commander.

• Establishing a logistics agency (either virtual or physical).

• Selecting the predominant service participating in the mission to manage joint requirements.

• Expanding the J–4 logistics readiness center.

Agile Sustainment

The concept of agile sustainment seeks to replace the historical logistics emphasis on mass with a new emphasis on speed and precision. Sustainment must become flexible so logistics organizations and support packages can be tailored to the operational situation confronting the joint warfighter. An agile sustainment system will increase the warfighter's confidence in his logisticians and allow him to make informed decisions. DOD's strategy for attaining agile sustainment includes implementing more effective business practices; reducing logistics requirements; improving joint tactics, techniques, and procedures; and adopting the latest technologies.

To reach these goals, DOD has cut wholesale inventories and increased the use of prime vendor contracts with the private sector; increased pre-positioning of materiel for all of the services; and developed a customer wait time metric and time-definite (guaranteed on time) delivery standards to improve the speed and reliability of service to customers.

To continue its progress toward agile sustainment, DOD is turning to the private sector to perform more logistics functions. DOD is contracting directly with the private sector to perform a large portion of its wholesale and retail logistics activities, which reduces the need for Government personnel and facilities. It also is using competitive sourcing to achieve greater efficiency in DOD logistics by holding competitions between commercial companies and Government organizations, with the most efficient party getting the work. With a greater contractor presence on the battlefield, DOD has taken several steps to improve management of contractors in theaters of operations. Joint Publication 4–0 has a chapter on contractors in the theater; the Defense Acquisition Deskbook contains a template that acquisition personnel can use in managing the deployment of contractors; and the Joint Operation Planning and Execution System (JOPES) has added procedures that make contractors visible in the time-phased force and deployment data.

To improve logistics support, DOD is—

• Reducing the number of petroleum products it consumes and limiting use of military-unique fuels.

• Emphasizing development of bare-base assets like the Army's Force Provider to support deployed forces in austere locations.

• Enhancing mortuary affairs support by increasing unit training and procuring state-of-the-art technology, including decontamination equipment.

• Improving materiel readiness by using sensors and wireless local area networks to predict component failure and provide maintenance personnel with repair procedures. DOD has established a Maintenance Technology Senior Steering Group to reengineer maintenance concepts and operations.

Operational Engineering

As the campaign plan observes, "Engineers furnish the temporary and permanent infrastructure to project and sustain forces." Besides creating a joint engineer

Web site, forming an Engineer Interoperability Review Board to foster joint engineering capabilities, and updating joint engineering doctrine, DOD is improving the Joint Engineer Planning and Execution System to provide the joint force planner with better engineer intelligence about the joint operations area and streamlining class IV (construction and barrier materials) vendor support.

Information Fusion

Timely, accurate information is the foundation of transformation. DOD seeks to merge operational and logistics information to provide a common operating picture accessible to both operators and logisticians. Access to information is vital to achieving the speed and precision envisioned for focused logistics.

DOD is working toward a network-centric logistics environment with improved asset visibility that can shape a mass of data into information that commanders can use. To reach that state, DOD is developing ways to better capture data through the use of automatic identification technology; integrating GCSS mission applications into the Global Command and Control System (GCCS); improving joint decision-support tools like GCSS (Combatant Command/JTF); and increasing data integrity through such actions as designating the Defense Logistics Agency as the DOD Logistics Functional Data Administrator.

Multinational Logistics

In the post-Cold War environment, multinational operations increasingly are becoming the norm for U.S. forces. This has brought the issue of multinational logistics to the forefront of DOD and service concerns. This new emphasis can be seen in the fact that multinational operations (as well as interagency operations) are discussed in Joint Vision 2020 but not in Joint Vision 2010.

To establish a basic framework for multinational operations, DOD has published Joint Publication 4–08, Joint Doctrine for Logistic Support of Multinational Operations. One tool DOD is using to improve its multinational logistics relationships is the acquisition and cross-servicing agreement (ACSA). An ACSA allows U.S. forces to exchange most types of support, such as fuel, food, and supplies, with another country in a contingency, including peacekeeping and humanitarian operations. These bilateral agreements promote interoperability, reduce duplication of support, and shrink the U.S. logistics footprint in a theater. The United States has signed ACSAs with 62 countries to date, with 7 more pending approval.

DOD also is developing its multilateral logistics relationships, such as improving interoperability with North Atlantic Treaty Organization (NATO) nations and participating in United Nations logistics process improvements.

Force Health Protection

Force health protection is a life-cycle health maintenance program for military personnel. It represents "the most comprehensive overhaul of the military health system in more than 50 years." DOD's strategy for life-cycle maintenance includes promoting and sustaining a healthy and fit force, preventing casualties, improving casualty care and management, and leveraging non-DOD sources for medical infrastructure and support.

Several programs are being pursued to implement these strategies. The services are partnering with trauma centers around the country to provide medics and corpsmen with standardized core competencies. DOD is developing joint doctrine for the services' forward surgical teams. DOD also is fielding the Defense Medical Logistics Standard Support (DMLSS) Program as the medical logistics component of the Theater Medical Information Program. DMLSS, according to the plan, "will be the military health system's standard medical logistics automated information system, dramatically improving medical logistics responsiveness at reduced costs in peace and war."

Joint Logistics Experimentation

To accomplish all the goals described in the Focused Logistics Campaign Plan, DOD is engaged in a wide-ranging process of experimentation and exploration. USJFCOM's Joint Experimentation Campaign Plan organizes experimentation around explorations of commercial off-the-shelf technologies that can improve the existing military force in the near term; emerging concepts, information systems, and technologies that will support the evolution of the force during the next decade; and revolutionary concepts and technologies that have the potential to completely transform the force.

The joint experimentation process has featured biannual Focused Logistics Wargames since 1999. The Millennium Challenge 2002 joint experiment combined live field exercises and computer simulations to test the military's ability to conduct rapid decisive operations (RDO) against a determined adversary. This year's Unified Quest 2003 was the first USJFCOM and Army cosponsored wargame.

Army Logistician's series on the Focused Logistics Campaign Plan has briefly summarized the plan's contents and highlighted some of its initiatives and programs. Logisticians should be familiar with the plan as the cornerstone of DOD logistics of the future. Copies of the plan can be downloaded at www.dtic. mil/jcs/j4/projects/foclog/focusedlogisitics.pdf. **ALOG**

—Story by Robert D. Paulus

Sustaining Northern Iraq

BY CAPTAIN JAMIE L. KRUMP

When the 173d Airborne Brigade dropped 1,000 paratroopers into northern Iraq, the provisional 201st Forward Support Battalion went into the theater with them.

On 26 March, the 173d Airborne Brigade conducted an airborne assault to secure the Bashur Airfield in northern Iraq and then prevent the Iraqis from moving north and the Turks and Kurds from moving too far south. The brigade was augmented by the 201st Forward Support Battalion (FSB) (Provisional) from the 1st Infantry Division (Mechanized), which provided a logistics battalion headquarters; supported Task Force 1–63, the heavy task force assigned to the 173d; and augmented critical shortages in the 173d's support structure.

Forming an FSB

The 201st FSB's mission began when 21 junior enlisted soldiers, noncommissioned officers (NCOs), and officers from the 1st Infantry Division Support Command (DISCOM) departed Vilseck, Germany. After a bus ride to Frankfurt Airport, they boarded a commercial flight to Vicenza, Italy, with a final destination of northern Iraq. They had little knowledge of what lay ahead or where specifically they were going in northern Iraq.

The battalion commander and some of the other key players were pulled out of Kosovo for the mission, and

The mountainous terrain near the Turkish and Iranian borders in northern Iraq is vastly different from the broad plains of southern Iraq.

the battalion executive officer had been in Turkey waiting to pass the 4th Infantry Division (Mechanized) through to northern Iraq. Still other members of the team had been preparing to go to Turkey for the same mission.

The 201st FSB was provisional in that it was not an actual FSB, but rather a conglomeration of soldiers from across the 1st Infantry DISCOM pulled together to serve as a battalion headquarters that would support the 173d Airborne Brigade. In addition to the 1st Infantry DISCOM personnel, soldiers from the 250th Forward Surgical Team (FST), the 38th Personnel Services Detachment, the 54th Quartermaster Mortuary Affairs Collection Point Platoon, and the 200th Materiel Management Center were added to the 173d's organic 501st Forward Support Company (FSC) to complete the 201st FSB (Provisional).

The 501st FSC consisted of approximately 150 soldiers who traditionally supported a light infantry brigade of about 2,000 soldiers. An area support group

heavily supplements this support in garrison since the FSC does not have the capability to support the 173d on its own.

Preparations in Italy

As soon as the plane touched ground in Italy, members of the 201st FSB began to get to know each other so they could function as a staff and formulate plans, develop logistics estimates, and try to anticipate problems. The battalion was notified that it would have to provide a support staff for the 173d Airborne Brigade during their insertion into and subsequent occupation of an undisclosed location in northern Iraq. Many questions had to be answered: Would the use of Turkish airspace be possible? Would the weather be suitable for an airborne assault? Would ground lines of communication (LOC) from the north be allowed? If not, how would the FSB provide adequate support for a light infantry brigade, augmented with a heavy mechanized unit from U.S. Army Europe, using only air LOC?

This mission would be the first time that a light airborne brigade, augmented with heavy mechanized assets, would be inserted completely by air. The chosen location was Bashur Airfield, which was under the operational control of the Joint Special Operations Task Force–North (JSOTF–N). The heavy forces consisted of a heavy reaction company (HRC) and a medium reaction company (MRC) from the 1st Infantry Division. The HRC and MRC were equal to a 200-man battalion with 5 M1A1 Abrams tanks, 5 M2A2 Bradley infantry fighting vehicles, 10 M113 armored personnel carriers, 4 M1064 mortar carriers, 1 M88 recovery vehicle, a scout platoon, a military police platoon, and a combat service support force enhancement module. The 201st FSB's job was to go in with the 173d Airborne Brigade and quickly set up the materiel management support the HRC and the MRC would need to back up light infantry operations in northern Iraq.

While in Italy, the FSB had refined the support requirements for the brigade, both with and without the HRC and the MRC. To mitigate a shortfall of scheduled sustainment flights, the 21st Theater Support Command (TSC) established a warehouse in Miesau, Germany, in which to store, prepare, and rig supplies for the FSB in northern Iraq. Sustainment flights to Iraq were increased to ensure that the brigade had enough supplies for all combat operations.

Operations at Bashur Airfield

The 173d conducted an airborne assault on 26 March to capture the Bashur Airfield. This was 24 hours before most of the logistics troops landed. Over the following 5 days, the remainder of the task force troops flowed in and began to develop a logistics hub.

The first aircraft carried the personnel and equipment needed to establish the base camp. Once the initial setup was complete, the sustainment flights of supplies and equipment began, signaling the start of real-time logistics. While simply inserting the equipment and personnel was a challenge, moving the HRC and the MRC quickly and setting up the support they needed to sustain the 173d Airborne Brigade often required logistics planning and executing "on the fly." The diverse FSB staff was up to the task.

The first elements of the FSB arrived by air with only two satellite-based wireless Iridium phones and a couple of laptop computers. They begged for and borrowed equipment whenever they could to establish a makeshift tactical operations center (TOC) until more equipment arrived.

Initially, the wireless phones were used extensively to make sure the sustainment flights had the right stuff on board. The 21st TSC's 200th Materiel Management Center (MMC) from Kaiserslautern, Germany, provided outstanding support to the FSB and to the brigade during this time. However, prioritizing supplies and sustainment shipments seemed to require a code that was difficult to crack. By the time the FSB's requirements were pushed through the logistics channels to the point of embarkation in Germany, either its needs had changed or it was discovered that the requirements had been relayed inaccurately. It became a vicious cycle that was difficult to overcome.

Even though the 200th MMC and the FSB coordinated the FSB's requirements, a number of mitigating factors often caused low-priority supplies to arrive on time while critical supplies were delayed. First, the airfield at Ramstein, Germany, was packed full of pallets for missions to Iraq, Afghanistan, and other locations. This made it difficult to marry up the right pallets with the right plane. Second, the FSB initially did not have a liaison at Ramstein to make sure the right pallets were loaded on the right plane. Third, the planes loaded with the FSB's supplies sometimes developed problems and had to return to Ramstein or go to Incirlik, Turkey. At other times, bad weather caused planes to be diverted to Constanta, Romania.

Eventually, most of these problems were solved. The battalion's communications equipment improved, as did its reporting system. The improved system captured an accurate status of what was on hand and where other supplies and equipment were needed.

The HRC and the MRC needed at least 22,000 gallons of fuel on hand to conduct sustained combat operations. Initially, the FSB established a 30,000-gallon fuel system supply point (FSSP) with one 20,000-gallon bag and one 10,000-gallon bag. Eventually, the FSSP grew to contain 80,000 gallons.

The decision was made to purchase diesel fuel

locally. It would be easy to convert from JP8 to diesel since filter changes are not required. (However, converting back to JP8 does require all new fuel filters.) Obtaining fuel in northern Iraq at first would appear to be a simple task. Not so. Northern Iraq had been cut off from resupply for many years, and the only way to get fuel was by smuggling it from southern Iraq and Turkey. It became apparent that purchasing fuel locally was not a workable solution when an initial contract for 40,000 gallons of fuel produced only several hundred gallons delivered in 55-gallon drums on the bed of a pickup truck.

Delivery of fuel by C–17s and C–130s proved to be impractical. Because of the limited size of the airfield at Bashur and the threat to the aircraft, the planes would not spend more than 45 minutes on the ground, which was not long enough to offload large quantities of fuel. All flights occurred at night, and unloading fuel from an airplane requires even more time during darkness.

The only workable solution for obtaining fuel was to establish a ground LOC. Because the FSB was cut off from all forces in the south, it was necessary to establish a northern ground LOC. Finally, Army Forces (Turkey) negotiated an agreement with the Turks to let fuel tankers cross their border into northern Iraq.

To make sure the fuel arrived at the right place and to ensure the safety of the drivers, the 173d sent escorts to meet the Turkish tankers at the Harbur border gate between Turkey and Iraq and accompany them to Bashur Airfield. Extensive coordinating and forecasting were required to prevent the fuel tankers from sitting too long before being emptied. These convoys ensured that sufficient fuel assets were available to call forward the HRC and the MRC to support the 173d as it conducted offensive operations to seize Kirkuk, Iraq, and its airfield.

Expanding Supply Management

Just as the 201st FSB was getting its systems in place to provide solid support to the 173d Airborne Brigade, the battalion was directed to take over the forecasting and managing of all supplies in northern Iraq. The supply and services officer in the 201st support operations office was already providing a daily logistics status report to the Combined Forces Special Operations Component Command, so she modified her report to include forecasts for the Air Force at Bashur Airfield, the JSOTF–N in Irbil, Iraq, and the Marine Expeditionary Unit in Mosul, Iraq. She quickly established a reporting chain with these units that allowed her to forecast accurately the needs of all units in northern Iraq. This was no easy task because there was a constant influx of units from all services into the region and it was impossible to forecast their arrival times correctly.

Supporting northern Iraq became an equation of supplies divided by trucks and soldiers on hand. No matter how many trucks were contracted or how many workers were hired, there still was a shortage of equipment and manpower to receive, break down, and distribute the quantity of supplies required. At the culmination of its mission, the 201st FSB supported over 7,000 personnel at four locations spread over an area spanning hundreds of miles. This included heavy mechanized units, aviation assets, special operations groups, Air Force units, Marine Corps units, and any other units that passed through the northern half of the theater.

To lessen the strain on available manpower, the FSB created the mother of all distribution plans. The plan broke down the loads on every truck by pallets to be delivered to each location (Mosul, Irbil, and so on). The 200th MMC personnel in Turkey forwarded to the FSB the bumper number of each truck, the name of its driver, and, based on data from the FSB's distribution plan, information on the units that were to receive the items on the truck. The FSB sent up unit requirements by location, and the 200th MMC folks in Turkey made sure that the pallets were configured correctly. The FSB escorts met the Kirkuk-bound convoy at the Iraq border and called out identifying truck and unit information. The identified trucks dropped out of the convoy and were escorted to the unit designated to receive the supplies they carried. This distribution system stopped the drain on resources in the FSB's supply support activity (SSA) and allowed the FSB to operate more efficiently.

Materiel Management Team Operations

From the beginning, the materiel management team (MMT) was an extremely important part of the FSB. The team helped the battalion to gain visibility over what was inbound and to give high priority to critically needed items. The MMT received a 48-hour crash course in a number of electronic communication, tracking, and supply support systems just before its departure for Italy.

Using a system called "support requisitions," MMT personnel submitted offline requisitions to the 200th MMC rear, which filled the requisitions and pushed the supplies forward on sustainment flights. This was an essential part of establishing the base camp, because initially there was no connectivity to the Standard Army Retail Supply System (SARSS); therefore, there was no way to place requisitions for deadlined vehicle repair parts, needed equipment, and supplies. Until SARSS was established, only the MMT had input into what was flown into Bashur Airfield in support of the 173d's mission.

Army and Air Force personnel assigned to the 173d Airborne Brigade clear land at Bashur Airfield in northern Iraq.

Standard Army Management Information Systems

After the essential equipment and supplies were on the ground and SARSS was established, the DISCOM's combat service support automation management officer (CSSAMO) looked for ways to make the supply system work more efficiently. He found that several of the Standard Army Management Information Systems (STAMIS) were not prepped properly before deploying. For example, a listing of forward unit identification codes had not been loaded into the Standard Army Maintenance System-1 (SAMS–1). Tweaking the STAMIS was a huge challenge, but eventually all systems were up and running.

Several other problems resulted from simple oversights. For example, some units did not come to the area of operations prepared to plug into different voltage power sources. Therefore, they lost equipment after plugging it into the wrong voltage. Supporting units were quick to push replacement equipment forward in order to get the STAMIS operational again for all units on the battlefield.

Maintenance Management in Northern Iraq

Maintenance management in Iraq followed models developed during rotations to the Combat Maneuver Training Center in Hohenfels, Germany, and the National Training Center at Fort Irwin, California. Maintenance meetings with all units were conducted every day at 1000 throughout the operation. The battle rhythm was always the same. The night before each meeting, the daily not-mission-capable disk from SAMS–1 was run. The maintenance NCO in charge scrubbed the resulting 026 (deadline report) to make sure the right vehicles were listed. Then two MMT soldiers recorded the status of all requisitions. In the morning, the support operations officer compared the scrubbed 026 to his copy with notes from the day before. After this thorough review, very few parts needed followup at the 1000 maintenance meeting.

The Battle for Kirkuk

Soon after everything had fallen into place at Bashur Airfield and the battalion's logistics systems were running smoothly, the 173d Airborne Brigade received a midnight mission to attack and secure the city of Kirkuk by dawn. The 1st Infantry Division HRC and MRC had just arrived at Bashur Airfield when it was determined that Kirkuk was becoming destabilized. The 173d was ordered to seize Kirkuk, stabilize it, and secure the airfield that was in the center of the city.

Inevitably, logistics support would be needed in the forward area. The HRC and the MRC went forward with only 5 days of supply, which meant that a forward logistics element would have to be set up quickly. An advance party consisting of the 201st FSB commander, two drivers, and four staff members went forward the morning after the 173d and the MRC moved into Kirkuk. The battalion executive officer remained in charge in Bashur.

As the battalion moved south, the challenges that would be involved in providing logistics support to a brigade (+) that was spread out over 125 miles became apparent. In fact, logistics became the ultimate challenge because most of the logistics personnel remained in Bashur while the majority of the supported units were forward. Not only did all sustainment received through the air hub in Bashur have to be transported forward, but supplies from the ground LOC had to be pushed to multiple locations.

Contracting was critical. The brigade's contracting officer contracted for 50 trucks to transport incoming supplies and to support all movement forward to Kirkuk. The contract included various types of Iraqi trucks. Most were 20 footers, but there were some 40 footers and lowboys. The truck contract bridged the logistics gap for the brigade for 30 days.

At Kirkuk, the brigade and the FSB began setting up operations on the airfield. The SSA and the maintenance platoon for the 501st FSC moved into a military hangar. This proved to be a great location for the SSA, because the hangar had lots of room and overhead cover and, most importantly, it was right next to the airfield.

A bulk fuels retail point was established in some carports across the street from the SSA, an ammunition section in the Iraqi ammunition supply point, and a 100,000-gallon FSSP (two 50,000-gallon bags) near the flight line to make it easy to refuel helicopters. The battalion headquarters was set up in a two-story building, and the brigade's administrative logistics operations center was placed next to the brigade's tactical operations center. When half of the 501st's hangar was given to the Air Force, the maintenance platoon moved a mile down the road into an Iraqi motor park.

In Bashur, the battalion executive officer and the remaining staff assumed command and control of the brigade elements and worked to clear Bashur Airfield. This was not easy because flights were still arriving and almost all of the subsistence and ammunition, along with 80,000 gallons of fuel, was still in Bashur.

In the week that followed, the 501st Transportation Platoon, augmented with the 50 contract trucks, continued to push supplies, personnel, and equipment to Kirkuk. Trucks were driven to Kirkuk one day and back to Bashur the next. However, Bashur still was not being cleared fast enough. Although the distance between the two points was only 125 miles, the condition of the roads and the Iraqi trucks caused the trip to take up to 6 hours. To speed up the process, the convoys began to make complete round trips every day. After about a week, the executive officer and most of the remaining staff departed Bashur to link up with the forward logistics element.

Essential supplies, including fuel, were left in Bashur to complete the closeout of the airfield; the rest were sent on to Kirkuk. The support operations maintenance officer and a six-man team were left to close out operations in Bashur. The last big push was moving ammunition from the ammunition holding area. Thirty pallets of ammunition were transported in one convoy. Air Force security personnel who needed to get to Kirkuk served as guards for the Iraqi trucks hauling ammunition. After this push, only the assistant S–2/S–3 and three others were left in Bashur to clear the FSSP.

It is usually easy to get rid of fuel, but in this instance it was difficult. About 30,000 gallons were left, and no one wanted it. JSOTF–N volunteered to send their contracted Turkish tankers up from Irbil to drain the fuel from the bags. Once this was complete, the team closed the FSSP and prepared it for shipment to Mosul, which was no easy feat without engineering support. The FSSP assets and fuel eventually were delivered to the 101st Corps Support Group in Mosul, which needed all the fuel and storage assets it could get.

Moving Toward a Steady State

When the entire 173d Airborne Brigade closed on Kirkuk, operations seemed to become more systematic. Providing support became much easier because the entire FSB was collocated. The battalion established an airfield at Kirkuk, and the Air Force provided critical support in developing the base. The job was big, and available supplies and assets were limited, so the Army and the Air Force often worked together; alone, neither service had enough equipment to build a base camp.

The 173d Airborne Brigade escorted Air Force fuel from Mosul to Kirkuk until the task was taken over by the 101st Corps Support Group. Once all of the Air Force personnel arrived, they slowly picked up all missions and began to support the 173d. The Air Force gradually became the base camp manager, and the Army became the tenant.

Thanks to the Air Force and the 173d's contracting officer, Kirkuk Airfield became a comfortable place to live and work. Windows were replaced, air conditioners were installed, and plumbing was fixed to provide showers. Just after Memorial Day, the 201st received word that it would be replaced by a team from the 21st TSC.

The lessons learned in providing sustainment in Iraq were many. The most refreshing lesson was that everyone could work together in a time of need. Units separated by tremendous distances pulled together to provide each other with supplies that normal supply channels could not provide.

It quickly became obvious to the FSB that outside planners could not anticipate all issues before the operation. The environment was far too fluid for those at higher echelons to come up with a reliable sustainment plan for providing constant support. The air LOC was unreliable because planes broke down and weather conditions were unpredictable. The ground LOC from the north worked well when the trucks made it across the border and the drivers did not go on strike before reaching their destinations.

The challenges presented were difficult, changes were slow, and the supply flow was sluggish. But everyone involved gave all they had to keep other units functioning. In spite of the sustainment problems it experienced, the 201st FSB is proud to have served with the 173d Airborne Brigade and proud of its logistics triumphs while sustaining northern Iraq. **ALOG**

'Old Ironsides' DISCOM Deploys to Iraq

BY COLONEL KENNETH S. DOWD

The commander of the 1st Armored Division's Division Support Command tells the story of his unit's move to Baghdad.

As I write this, the 1st Armored Division—the "Old Ironsides" division—has been in Iraq for about 2 months. Its Division Support Command (DISCOM), which I command, is providing responsive daily support to eight brigades and several separate battalions and companies, totaling over 30,000 soldiers. Looking back, I am impressed by the complex series of actions that brought us from our bases in the Central Region of Germany through base camps in Kuwait to our current forward locations in Iraq. It has been a long road highlighted by many challenges, initiatives, and, most importantly, a tremendous amount of dedication and hard work by our young soldiers and noncommissioned officers. What follows is an attempt to capture our great soldiers' accomplishments, both during the deployment and during our initial support of the 1st Armored Division's warfighters in Iraq.

Predeployment Activities

Groundwork for deployment. The groundwork for our deployment was laid over a year ago. The 1st Armored Division began executing predeployment tasks just as all U.S. Army Europe units began transforming from a theater focus on Europe's Central Region and the Balkans to a worldwide focus as part of a rapidly deployable force.

The division began deployment preparations for Iraq with a series of deployment exercises that concentrated on intermediate staging base (ISB) operations. All units were required to conduct ISB operations before each movement to a major training area. All unit movements to gunnery and Combat Maneuver Training Center rotations were used to verify and codify the division's reception, staging, onward movement, and integration (RSO&I) processes and systems. The division had to establish comprehensive readiness tracking systems so it could see the status of all of its combat systems and enablers. It also had to use the Defense Transportation Recording and Control System, radio frequency identification tags, and the Joint Deployment Logistics Model to achieve in-transit visibility of division materiel during tactical road marches. These tasks improved the division's ability to track the buildup of combat power from its home station to the deployment theater. Tracking readiness and movements simultaneously was a tremendous challenge for the movement control section and the maintenance and supply section of the division's materiel management center (MMC).

STAMIS connectivity. A key to success during deployment preparations was the efforts of the combat service support automation management office (CSSAMO) to improve the reliability and durability of the division's Standard Army Management Information Systems (STAMIS). The CSSAMO focused on developing ways to improve connectivity by essentially creating a "methods menu" for users to follow when transferring STAMIS data. All possible courses of action for transferring data were considered as part of the menu, including diskette exchange, wireless CAISI (Combat Service Support Automated Information System Interface), high-frequency radio BLASTing, and satellite connectivity.

The CSSAMO's innovative approaches to improving systems reliability and connectivity were critical to the division's ability to monitor its daily maintenance and supply status successfully. The benefits were twofold: accurate and timely maintenance data for the division commander, and increased soldier confidence in the supply system.

Deployment training. The 1st Armored Division developed and implemented an intense deployment training program that set the stage for mission success. During the predeployment period, the DISCOM—

• Developed tactics, techniques, and procedures

(TTPs) to prepare for success in Iraq.

- Conducted a number of seminars focused on logistics over extended distances and combat service support considerations during desert operations.
- Executed several requirements reviews for authorized stockage lists (ASLs) and prescribed load lists based on desert operations.
- Developed several courses of action for ensuring ASL mobility.
- Conducted studies to identify and analyze potential key logistics nodes for the early stages of deployment.

"2-minute drill." The capstone event in the predeployment training process was the division's "2-minute drill." Essentially, this was a division-wide gunnery exercise involving all major weapon systems, including crew-served and individual small arms. This intensive training period challenged the DISCOM's ability to maintain the readiness of the division's rolling stock and individual weapons while preparing to deploy. The training was completed in 3 weeks and required the most intense use of weapons ranges in the recent history of the division. The DISCOM not only supported the supply and maintenance of all weapon systems but also qualified over 1,800 soldiers on their individual weapons.

The true heroes of the 2-minute drill were the personnel of the division ammunition office (DAO). They were given the monumental task of ensuring that all range ammunition requirements were resourced satisfactorily. For nearly 30 straight days, the DAO processed requests, issued ammunition, and processed the turn-in of live and residue ammunition. Through their responsive and flexible efforts, every ammunition requirement was met.

Combat health support. Our predeployment preparations began with in-depth planning, not only within the division's battle staff but also with our supporting corps medical brigade and surgeon's cell staff. Through many planning conferences, coordination meetings, and rehearsals, we tailored a combat health support plan to best sustain the division's anticipated combat operations.

The conferences focused on medical evacuation, command and control of evacuation assets, preventive medicine, and field sanitation. We also ensured that echelons-above-division (EAD) combat health support assets were integrated and synchronized in the plan. Other home-station preparations included ordering 100 percent of our class VIII (medical materiel) ASL to create an immediate replenishment ability once we were on the ground; conducting combat lifesaver training, with the goal of having one trained combat lifesaver for every combat system in the division; and ensuring deployment readiness for all medical areas,

including immunizations, dental care, and female health.

Maintenance focus period. Immediately following the 2-minute drill, the division moved into a comprehensive focused maintenance period at the organizational and direct support (DS) levels to repair vehicles and weapon systems. This period was intended to last just over 2 weeks, but it was compressed to meet our deployment schedule.

The DISCOM assumed a risk during this period by concentrating its resources on maintaining the equipment of customer units and deferring maintenance on its organic equipment. As a direct result of this effort, the division successfully loaded 8,500 pieces of rolling stock on ships with less than 60 pieces deadlined. The division MMC's materiel readiness section tracked the readiness status of equipment being outloaded daily, identified required maintenance, and determined the class IX (repair parts) that would be needed on arrival in Kuwait.

Final predeployment actions. While the DISCOM's lead elements deployed to Kuwait with the division's advanced echelon (ADVON), the DISCOM's support battalions sustained deployment preparations and continued to process all incoming class IX requirements. These repair parts were consolidated at the 123d Main Support Battalion (MSB) and containerized in 20-foot MILVANs, then placed in the last division force package. This final push of repair parts was critical to sustaining the division's readiness while the class IX pipeline transitioned from the Central Region in Germany to Southwest Asia.

The DISCOM also focused on honing convoy procedures by conducting several days of convoy live-fire exercises. This was no small task since all of the DISCOM's vehicles and crew-served weapons were already in transit to Kuwait. But by using equipment loaned by the 1st Infantry Division (Mechanized), we were able to run 13 platoon iterations of day, night, and nuclear-biological-chemical convoy live-fire exercises.

Actions in Kuwait

ADVON initiatives. On 18 April, the lead elements of the DISCOM deployed as a part of the 1st Armored Division ADVON. The 14-soldier DISCOM team was led by the chief of the division MMC and included personnel from the ground safety office, CSSAMO, DAO, and the property book office and the division senior maintenance technician.

The DISCOM ADVON team focused on establishing connectivity to the Standard Army Retail Supply System (SARSS–2A), replenishing the Central Region's ASL zero balance, ensuring that sufficient class I (subsistence) was available to support the flow of 1st Armored Division personnel into the theater, and

constructing and distributing ammunition basic loads.

The team also was responsible for the key task of integrating the division with the theater and corps logistics infrastructures. This was a critical prerequisite for setting the conditions for the division's successful RSO&I in Iraq. A cell was established at Camp Arifjan, Kuwait, to connect with the theater logistics RSO&I cell. This gave the DISCOM instant access to staff sections that could provide logistics enablers for the division, thereby laying the foundation for the division to conduct a rapid and smooth transition from the camps in Kuwait to forward deployed locations in Iraq.

Arrival of main body. Once the DISCOM headquarters and the support battalion main bodies began to flow into Kuwait, the DISCOM shifted its focus to becoming familiar with the climate, terrain, and convoy procedures. While the division resided in Kuwaiti base camps, the DISCOM's logistics focus was the establishment of SARSS and the Standard Army Maintenance System (SAMS). The CSSAMO quickly established connectivity through the use of satellite communications. The rapid establishment of these key systems allowed us to begin operating the class IX pipeline and maintain visibility of the readiness of key systems.

Combat health focus. Once in theater, the DISCOM moved quickly to link the EAD combat health support assets to its forward support medical companies. The division received both DS air and ground ambulance platforms and embedded forward surgical, combat stress control, and preventive medicine teams with each ground maneuver brigade combat team. The DISCOM also had to identify additional resources needed to support the expanding number of units attached to the division.

The division medical supply office (DMSO) quickly established its links to the corps and theater medical logistics infrastructure to begin the class VIII resupply process. Our division surgeon and division medical operations center personnel, in coordination with the DMSO, worked hard to anticipate customer unit requisitions. They identified and built level III class VIII stocks to reduce turnaround times for forward surgical teams and medication resupply and established a means of tracking malaria prophylaxis, chronic medications for soldiers, and anthrax and smallpox vaccinations. [Level III care is lifesaving surgery and resuscitative care.] Our combat health support team staged capabilities in forward locations and sought to acquire items to augment the capabilities of our forward care providers.

The challenge for the DISCOM was to reduce the number of soldiers who had to be evacuated to level III treatment facilities and to anticipate a growing range of illnesses and injuries while supporting stability operations. We continue to refine our concept of support to adapt to the changing nature of stability operations. Our combat health support team continues to conduct monthly conferences with all of the division's care providers and medical leaders to better synchronize support for all division soldiers.

Actions on the Objective

Onward movement. The division's deployment was very successful through the reception and staging portion of RSO&I. We then faced the next hurdle, onward movement and integration, which proved to be the most challenging phases of the RSO&I process.

The sheer harshness of the desert environment and the extended distance from the base camps in Kuwait to the forward locations in Iraq made onward movement an arduous task. The division conducted a 450-kilometer movement, lasting roughly 18 hours, to relocate from the base camps to the relief-in-place (RIP) sites in the Baghdad area of operations, where it would relieve the 3d Infantry Division (Mechanized). The tactical road march was conducted over rugged terrain and in extremely hot weather. We also had to protect our force against attacks by sporadic rocket-propelled-grenade and small-arms fire directed against us along the route.

To facilitate the division's rapid transition from RSO&I to its current operations in the Baghdad area, the DISCOM again surged to meet emerging maintenance and supply requirements. The heaviest burden was placed on the MSB's maintenance and transportation companies, which furnished recovery maintenance teams along the route to Baghdad. These teams conducted multiple round trips along the route to ensure that all equipment was rapidly recovered and moved forward to prevent theft and damage from unfriendly elements along the route.

While we were in the Kuwaiti base camps, we conducted numerous battle drills to prepare for contingencies along the route of march to Baghdad. These drills proved essential to our successful movement. Also critical to our success was the dissemination of daily intelligence and route summaries derived from previous convoys. This critical information was pushed down to the individual soldier through the use of a situational strip map that provided a visualization of critical points and named areas of interest (NAIs) along the route. It also offered a short synopsis of recent enemy and civilian activity in the vicinity of each NAI. This information allowed our soldiers to prepare mentally and anticipate the actions they would be required to take.

The DISCOM made a significant effort to harden vehicles against unexploded ordnance, improvised

explosive devices, and mines. We also took actions to protect secondary loads from looters and large crowds congregated at specific areas along the route.

RIP operations. A DISCOM advance-party RIP team was sent forward several days before the movement of the main body to coordinate battle handoff tasks with the 3d Infantry Division. The RIP team immediately began a deliberate mission analysis with the 3d Infantry Division's DISCOM, which resulted in a list of 18 critical combat service support tasks for a successful RIP. The analysis also included basic force-protection tasks, such as internal base-cluster defense, intelligence collection and dissemination, situational awareness, TTPs for convoy operations, and base life support.

Initially, the 3d Infantry Division provided the majority of combat service support to the 1st Armored Division, allowing the 1st Armored Division's support battalions to establish base DS capabilities and build DS stocks. The entire DISCOM RIP process was conducted over 3 weeks because of the extended timeline for each support battalion to move forward with their habitual brigades. The key to success was decentralized execution and a fundamental understanding of the DISCOM concept of support. After completing the RIP, the 1st Armored DISCOM surged to provide backup support to the 3d Infantry Division so that the division could prepare its units for redeployment.

Support "Baghdad style." After our support battalions closed on their forward operating locations and the new task organization took effect, the DISCOM assumed the mission of supporting four additional brigades. That made us responsible for supporting a total of eight brigades, three separate battalions, and four separate companies. The supported units were dispersed across the greater Baghdad metropolitan area. A DISCOM traditionally finds itself supporting over greater distances, which is more in line with the doctrinal templates. Our current support battalion positions are located within a 25-mile radius, with the exception of the MSB.

The fundamental challenge the DISCOM faced while supporting units inside Baghdad was providing force protection to logistics convoys through the maze of road networks and daily traffic. The long-term concept of support was to push all commodities directly to brigade support areas from the MSB and the logistics release point (LRP), but our initial procedure was supply point distribution at the LRP. This was done to allow the MSB to complete its second round trip of equipment and trailers from Kuwait and to complete a maintenance standdown of Bravo Company's transportation assets. The LRP became our center of gravity for all commodities; sustainment stocks were pushed there from multiple locations, including corps logistics support areas, Kuwait, and directly from the

containerization consolidation points at Dover and Charleston Air Force Bases in the United States.

Sustaining Current Operations

Now that we are set up and sustaining operations in Baghdad, we continue to refine the concept of support and convoy operations procedures while striving to improve soldier quality of life. By using contracting support and field ordering officers, we have successfully procured goods and services that have improved our transportation and materials-handling equipment (MHE) capabilities.

Our major lessons learned concern the increased burden on the division's transportation company from supporting four additional brigades, the unreliability of rough-terrain container handlers (which are needed for distributing 20-foot MILVANs), and our extremely heavy reliance on MHE. We recommend that the theater and corps MMCs review class IX requirements for this type of operation in a desert environment; we need to look again at requirement objectives because of the heavy use of equipment. Each of these issues created serious maintenance challenges as well an increased emphasis on effective management of vehicle drivers.

The last year has passed very quickly. The accomplishments of the soldiers of the 1st Armored Division's DISCOM have been impressive. As an example, just over a year ago we deployed the entire MSB and the 127th Aviation Support Battalion about 30 kilometers from home-station bases to local training areas for their first exercise evaluations in nearly 6 years. Twelve months later, we successfully deployed to Kuwait, moved 450 kilometers into Iraq, and now are conducting daily LOGPAC (logistics package) operations under combat conditions. The DISCOM is proving its mettle every day. We currently are providing the division with first-rate daily logistics support, and we remain postured to respond to all emerging contingencies. **ALOG**

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What Army Logisticians Should Know About the Navy

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

The fast combat ship USNS Supply *(top) provides the amphibious assault ship* USS Wasp *with fuel during an underway replenishment.*

A key aspect of our military's transformation process is the increased emphasis on joint, interagency, and multinational (JIM) operations. The other military services use many of the same supplies that the Army uses—food, potable water, fuel, construction and barrier materials, sundry items, and medical supplies—and depend on the same strategic (and in some cases, intratheater) transportation assets. Therefore, resourceful Army logisticians who understand the supply and transportation methods of the other services will be in a better position to tap into their resources if needed in future operations.

In previous issues of *Army Logistician,* I described the Marine Corps (July–August) and the Air Force (September–October) from an Army logistician's perspective. This article describes the Navy in a similar light and discusses its organizational structure, primary weapon systems, logistics methods, and transformational direction.

Navy Organization

As of May, the Navy had over 380,000 active-duty personnel and more than 152,000 reservists (approximately 87,500 Selected Reservists and 65,000 Individual Ready Reservists.) The Secretary of the Navy oversees both the Commandant of the Marine Corps and the Chief of Naval Operations, positions comparable to the Chief of Staff of the Army.

The Naval Operating Forces and the Shore Establishment are directly subordinate to the Chief of Naval Operations. For training and administrative purposes, all operating forces fall under the Commander of the Pacific Fleet or the Commander of the Atlantic Fleet. The latter is designated as the Commander of the Fleet Forces Command and represents both fleets.

The primary mission of the two fleets is to provide operational forces to the regional combatant commanders of the U.S. Central Command (CENTCOM), U.S. Pacific Command (PACOM), U.S.

European Command (EUCOM), U.S. Northern Command (NORTHCOM), and U.S. Southern Command (SOUTHCOM). In addition to the Atlantic and Pacific Fleets, there are five numbered fleets: the 2d, 3d, 5th, 6th, and 7th. The 2d Fleet is headquartered in Norfolk, Virginia, and operates in the Atlantic Ocean, while the 3d Fleet is headquartered in San Diego, California, and operates in the eastern and central Pacific Ocean. Both fleets are actively involved in training U.S. forces. The 5th Fleet is headquartered in Manama, Bahrain, and operates in the Middle East waters of the Red Sea, the Arabian Sea, the Persian Gulf, and the western Indian Ocean. The 6th Fleet is headquartered in Naples, Italy, and operates in the Mediterranean Sea. The 7th Fleet is headquartered in Yokosuka, Japan, and operates in the Western Pacific and the Indian Ocean. The 5th, 6th, and 7th Fleets provide naval forces for CENTCOM, EUCOM, and PACOM, respectively.

Naval Operating Forces

In order to understand the structure of the Naval Operating Forces, it is useful to know the naming conventions that are used to identify ships. For instance, the prefix "USS" (U.S. ship) in a vessel's name indicates that it is a Navy ship, it is manned by Navy personnel, and it is armed.

Ships that are similar in construction are grouped within a class that is named after the first ship constructed within that class. Besides their names, all USS ships have specific hull identifiers. Using the *USS Nimitz* (CVN 68) as an example, the "USS" designation means that U.S. naval forces man the *Nimitz*. The "CVN" indicates that the ship is a multipurpose aircraft carrier vessel, nuclear-powered. The number "68" is assigned only to the *USS Nimitz*. The lower the number, the earlier the ship was built compared to other CVN vessels. For instance, the *USS Nimitz* (CVN 68) was built before the *USS Dwight D. Eisenhower* (CVN 69), which was built before the *USS Carl Vinson* (CVN 70).

The prefix "USNS" (U.S. naval ship), "SS" (steam ship), or "MV" (motor vessel) indicates that the ship is part of, or chartered by, the Navy's Military Sealift Command (MSC) and is primarily manned by a civilian crew. All ships that have the letter "T" as the first letter of the hull identifier belong to the MSC. A "T–AO" designation indicates that the ship is an underway replenishment oiler. The number following the designation is a hull identifier for that specific ship. For example, the *USNS Henry J. Kaiser* (T–AO 187), is an MSC underway replenishment oiler that is manned by a primarily civilian crew. The "187" portion of the hull identifier is assigned only to the *USNS Henry J. Kaiser.*

Commissioned Ships

As of May, the Navy had 269 active commissioned (USS) ships. This number excludes MSC and Ready Reserve Force vessels. The number of active commissioned ships can be broken down into these categories: 12 aircraft carriers, 104 surface combatants (cruisers, destroyers, or frigates), 40 amphibious assault ships, 35 support/mine warfare ships, 18 fleet bal-listic missile submarines, 54 nuclear attack submarines, 6 combat logistics ships, and the legendary training ship, the *USS Constitution*.

• *Aircraft carriers*. The largest Navy ships are the aircraft carriers. The oldest of these are the two Kitty Hawk-class carrier vessels (CV), the *USS Kitty Hawk* (CV 63)—to be decommissioned in 2007—and the *USS Constellation* (CV 64). There is only one *USS John F. Kennedy* (CV 67)-class carrier and only one *USS Enterprise* (CVN 65)-class carrier. There are nine Nimitz-class carriers: the *USS Nimitz* (CVN 68), *USS Dwight D. Eisenhower* (CVN 69), *USS Carl Vinson* (CVN 70), *USS Theodore Roosevelt* (CVN 71), *USS Abraham Lincoln* (CVN 72), *USS George Washington* (CVN 73), *USS John Stennis* (CVN 74), and *USS Harry S. Truman* (CVN 75). [Editor's note: The *USS Ronald Reagan* (CVN 76) was commissioned on 12 July, bringing the total number of aircraft carriers to 13]. Aircraft carriers are over 1,000 feet long; each carries about 85 aircraft and is manned by a crew of about 5,700 (3,000 are part of the ship's crew and 2,700 support aviation operations).

• *Surface combatants*. Cruisers, destroyers, and frigates are collectively referred to as surface combatants. Cruisers (Ticonderoga class) perform air, undersea, and surface warfare roles. Each is about 567 feet long and has a crew of about 360 sailors.

Destroyers (Spruance class) primarily perform an antisubmarine role, while guided-missile destroyers (Arleigh Burke class) perform air warfare, undersea warfare, and surface warfare roles. They are similar in size to cruisers and each carries a crew of about 350 sailors.

Frigates (Oliver Hazard Perry class) are used primarily in an undersea warfare role to protect shipping, although they do have limited air warfare capabilities. Each is about 450 feet long and has a crew of 300 sailors.

• *Amphibious assault ships*. The Navy's amphibious assault ships are about 830 feet long and are manned by crews of about 1,100 sailors. Amphibious assault ships are the primary ships for the assault operations of Marine Expeditionary Units. Each vessel supports approximately 1,900 embarked marines. These ships carry landing craft, helicopters, and vertical-lift Harrier jets to support the Marine forces.

Amphibious transport dock ships also are used to transport and employ Marine forces. These ships can carry both aircraft and amphibious vehicles. Each is about 600 feet long, is manned by a crew of approximately 400 sailors, and supports about 800 embarked marines.

Dock landing ships also support amphibious operations. They are about 600 feet long and have crews of approximately 400 sailors.

Amphibious assault ships, amphibious transport dock ships, and dock landing ships can transport three different types of smaller vessels: landing craft, utility (LCU); landing craft, mechanized (LCM); and landing craft, air cushioned (LCAC). These vessels are placed in the water to "land" (transport) forces and equipment ashore. Unlike larger ships, these craft can operate in shallow water.

LCUs are about 135 feet long; each has a crew of 14 sailors and can haul 125 tons of cargo. There are two types of LCMs: the LCM 8 is 74 feet long and can transport 1 M60 tank or 200 troops. The LCM 6 is 56 feet long and can transport 34 tons or 80 troops. The LCAC is 88 feet long and can transport 1 M1 tank, 4 light armored vehicles, or 24 troops. The LCAC hovers slightly above the land or the sea on an air cushion that allows it to access about 70 percent of the world's coastline, while conventional landing craft like the LCU and the LCM can land at only 15 percent of the world's coasts.

Two converted amphibious assault ships, the *USS Mount Whitney* and the *USS Blue Ridge*, now serve as command ships for the 2d and 7th fleets, respectively. The *USS Coronado* and the *USS La Salle*, two converted amphibious transport dock ships, are the command ships for the 3rd and 6th Fleets, respec-tively.

• *Mine warfare ships.* Mine countermeasure ships (Avenger class) are designed to clear mines from vital waterways. They are 224 feet long, and each carries a crew of 84 sailors.

Coastal mine-hunter ships (Osprey class) also clear mines from vital waterways. They are 188 feet long and have a crew of 50 sailors each. Patrol coastal ships provide coastal patrol and interdiction surveillance. They are 170 feet long and have a crew of 30 sailors each.

Rescue and salvage ships render assistance to disabled ships and provide towing, salvage, diving, firefighting, and heavy-lift capabilities. They are 255 feet long and have a crew of about 100 sailors each.

• *Fleet ballistic missile submarines*. These Ohio-class submarines are nuclear powered and are armed with long-range strategic missiles. Combined, these submarines carry 50 percent of all U.S. strategic warheads.

Guided-missile submarines (Ohio class) are currently being developed by converting four former fleet ballistic missile submarines. They will be nuclear powered, armed with tactical missiles, and have the capability to transport and support Special Operations Forces. They are 560 feet long, and each carries a crew of 155 sailors. They will be able to transport as many as 66 Special Operations Forces personnel each.

• *Nuclear attack submarines.* These Los Angeles-, Seawolf-, and Virginia-class submarines are designed to locate and destroy enemy submarines and surface vessels. Each submarine is about 360 feet long and has a crew of about 135 sailors.

• *Combat logistics ships.* Fast combat support ships (Sacramento class) are the Navy's largest combat logistics ships. Each can carry 7,434,000 gallons of fuel, 2,150 tons of ammunition, 500 tons of dry stores, and 250 tons of refrigerated stores. These ships are about 775 feet long, and each has a crew of about 600 sailors. They have the speed and armament to keep pace with the carrier battle groups. The current trend in the Navy is to transfer these ships to the MSC.

• *Training ship.* The *USS Constitution,* which is maintained at the former Charlestown Navy Yard in Massachusetts, was commissioned and put to sea in 1798. It was condemned in 1830, but public sentiment saved the ship, and it was rebuilt in 1833 and again in 1877, 1897, and 1997.

Naval vessels normally operate as part of groups. A typical carrier battle group consists of an aircraft carrier, a cruiser, two destroyers, an attack submarine, and a fast combat support ship. A surface action group consists of three destroyers and has antiaircraft, antisurface, and antisubmarine capabilities.

An amphibious ready group typically consists of an amphibious assault ship, an amphibious transport dock ship, and a dock landing ship, along with a Marine Expeditionary Unit.

The expeditionary strike group that the Navy is currently designing will consist of an amphibious ready group and a destroyer, a cruiser, a nuclear attack submarine, and one of the destroyers currently under development.

Military Sealift Command

Providing logistics support to the Navy's fast combat support ships is one of MSC's missions. It provides ocean transportation of equipment, fuel, supplies, and ammunition to support U.S. forces worldwide. MSC currently operates 123 noncombatant, civilian-crewed ships located throughout the world and has access to 68 other ships that are kept in a reduced operating status so that they can be activated rapidly if needed. The Navy's MSC, along with the Army's Military Traffic Management Command, and the Air Force's Air Mobility Command, are components of the U.S. Transportation Command (TRANSCOM). The MSC manages five separate ship programs: the Naval Fleet Auxiliary Force, the Afloat Pre-positioning Force, Sealift Ships, Special-Mission Ships, and the Ready Reserve Force.

• *Naval Fleet Auxiliary Force.* The ships in this force directly support the Navy's combatant ships with the logistics they need to remain at sea for long periods. Two Naval Fleet Auxiliary Force ships, the *USNS Comfort* and the *USNS Mercy*, serve as floating hospitals. Other ships serve as fleet ocean tugboats, fast combat support ships, oilers, ammunition ships, and combat stores ships.

MSC's fast combat support ships are the same as the operational Navy's fast combat support ships, except that the MSC vessels are operated by primarily civilian crews and are not commissioned vessels. The underway replenishment oilers (Henry J. Kaiser class) can carry about 7,140,000 gallons of fuel oil or aviation fuel. They are about 678 feet long, and each has a crew of 100. The seven ammunition ships provide underway replenishment of all types of ammunition. These ships can transport about 6,000 tons of ammunition, are 564 feet long, and have a crew of about 150 each. The six combat stores ships provide subsistence, including frozen, chilled, and dry provisions; individual clothing and equipment; construction and barrier materials; personal items; medical material; and repair parts to Navy ships at sea. They are 550 feet long and have a crew of about 165 personnel each.

The Navy is currently developing an Advanced Auxiliary Dry Cargo Ship Program, which eventually will have 12 ships each capable of carrying 5,910 tons of dry cargo and 756,000 gallons of fuel. They will be 689 feet in length.

• *Afloat Pre-positioning Force (APF).* The APF provides intertheater mobility and storage of U.S. military equipment and supplies. Forty-two ships currently serve in this role: 16 maritime pre-positioning ships

carry equipment and supplies for the Marine Corps; 13 combat pre-positioning ships (also called Afloat Pre-Positioning Ships [APS]–3) carry equipment and supplies for an Army heavy brigade; and 13 logistics pre-positioning ships are loaded with Defense Logistics Agency fuel, Air Force ammunition, Marine Corps aviation support equipment, and Navy munitions.

• *Sealift Ships.* These ships provide ocean transportation for the Department of Defense (DOD) in peace, contingencies, and war. The program is organized into three offices: the Tanker Project Office, the Dry Cargo Project Office, and the Surge Project Office.

In coordination with the Defense Energy Support Center, the Tanker Project Office transports petroleum products to DOD storage and distribution facilities worldwide. The Dry Cargo Project Office oversees the operations of 20 MSC-chartered cargo ships and arranges for the delivery of military supplies and equipment aboard U.S.-flagged commercial ships. The Surge Project Office provides strategic lift capabilities needed to support the U.S. military in peace or war, either through U.S.-flagged commercial vessels or Government-owned surge sealift.

Government-owned surge sealift is divided into three categories: fast sealift ships, which can sail at maximum speeds of over 30 knots for short periods; surge LMSRs (large, medium-speed, roll-on-roll-off vessels); and the Ready Reserve Force.

Together, MSC's eight fast sealift ships can carry almost all of the equipment to outfit an Army mechanized infantry division. LMSRs can sail at 24 knots and can carry up to 380,000 square feet of cargo (equivalent to eight football fields) each. MSC currently has 11 surge LMSRs.

• *Special-Mission Ships.* MSC's 26 Special-Mission Ships provide a wide variety of highly specialized ocean-going platforms for missions that include oceanographic and coastal surveying, ocean surveillance, missile-tracking, cable laying and repair, deep submergence recovery, and counter-drug operations. Military and civilian scientists and technicians carry out the unique missions of these ships, which are operated by MSC employees and contract mariners.

• *Ready Reserve Force.* The ships in the Ready Reserve Force are controlled by the Maritime Administration (part of the U.S. Department of Transportation) but are turned over to MSC during war or other emergency. They each have a crew of about eight mariners who live on board. The ships go out to sea with a full crew to practice underway replenishment and participate in exercises. They include roll-on-roll-

A Tomahawk land attack missile is launched from the guided missile cruiser USS Anzio.

off ships, crane ships, breakbulk ships, and tankers that can be activated in 4 to 20 days.

The Shore Establishment

The Shore Establishment supports the Naval Operating Forces by providing repair facilities, communication centers, training areas and simulators, intelligence and meteorological support, storage areas, medical and dental facilities, and air bases. The Naval Supply Systems (NAVSUP) Command, which is headquartered in Mechanicsburg, Pennsylvania, is of primary importance to Navy logisticians. NAVSUP's most important responsibility is overseeing the worldwide integrated Navy supply system that provides sustainment to the fleet. Its subordinate activities include the Naval Inventory Control Point, the Navy Exchange Service Command, the Navy Supply Information Systems Activity, the Fitting Out and Supply Support Assistance Center, the Fleet and Industrial Supply Centers, and the Naval Operational Logistics Support Center.

The Naval Inventory Control Point exercises centralized control over 350,000 different line items of repair parts, components, and assemblies that keep ships, aircraft, and weapon systems operating. It also provides logistics and supply assistance to selected nations through the Foreign Military Sales Program.

The Navy Exchange Service Command includes 110 Navy exchanges, 41 Navy lodges, and 186 ships' stores. Sales exceed $2 billion annually and generate over $67 million in profits that support morale, welfare, and recreation programs ashore and afloat. It also manages the Navy's clothing program, providing both uniforms and specialized protective clothing to the Navy.

The Navy Supply Information Systems Activity is

the Navy's central agency for designing, developing, and maintaining information systems supporting numerous shore activities in the functional areas of logistics, transportation, finance and accounting, and inventory modeling.

The Fitting Out and Supply Support Assistance Center provides naval forces and other Federal agencies with quality logistics, engineering, training, and other support services on a worldwide basis. The Navy plans to dissolve this activity and transfer its missions to other activities within NAVSUP.

The six Fleet and Industrial Supply Centers provide a variety of logistics support services and products to Navy and other military customers in their respective regions. These products and services include material management, contracting, transportation, fuel services, customer service, hazardous materials management, household goods movement, consolidated mail services, and supply consultation on a regional basis. Each center is collocated with a Defense Logistics Agency depot, which coordinates the physical distribution of stocks.

The Naval Operational Logistics Support Center and its functional subcomponents (petroleum management, transportation management, and ammunition management) manage fleet fuel requirements; oversee five major fuel depots; manage the transportation of Navy material; determine and fund the Navy's transportation requirements; and provide centralized inventory management and business systems development functions for the Navy's non-nuclear ordnance stockpile, valued at almost $33 billion.

Underway Replenishment

The Shore Establishment works closely with the Naval Operating Forces to provide logistics so Navy ships can be resupplied at a number of deepwater ports worldwide. However, berthing at ports leaves Navy ships vulnerable to land-based and shallow-water attacks and temporarily interferes with the Navy's deepwater mission. As an alternative, combat logistics ships and MSC vessels can sustain the Navy's warfighting vessels with fuel, ammunition, provisions, ships' stores' items, and repair parts at sea using either vertical replenishment or connected replenishment.

Vertical replenishment primarily involves using helicopters to lift cargo from a supply ship to a combatant ship. Over 60 percent of underway replenishment ships have two helicopters, typically a CH–46 Sea Knight, which is similar to, but smaller than, the Army's CH–47 Chinook; and an SH–60, which is similar to the Army's UH–60 Black Hawk. During vertical replenishment, CH–46 helicopters can carry loads that weigh about 4,000 pounds.

Connected replenishment is usually conducted while both supply and combatant ships are "in stream," or moving, at speeds ranging from 10 to 16 knots. It is not unusual for an MSC replenishment ship to position itself between two Navy warships so it can resupply both at the same time using multiple replenishment stations. Replenishment at sea of dry cargo is conducted using tensioned span wire cables that connect the two vessels. Cargo to be transferred is connected to a trolley that rides on the cables. Under ideal conditions, a container load of 8,750 pounds can be transferred in less than 2 minutes.

Underway replenishment procedures require skilled crews and intense training. Experienced sailors and marines can conduct replenishment operations routinely in sea state condition 4 (moderate waves that are between 4 and 8 feet high) and, when necessary, in sea state condition 5 (rough-looking waves from 8 to 13 feet high. (A sea state is a means of describing the prevailing ocean wave activity based on the Beaufort wind force scale. Sea state conditions range from 0 to 9. In sea state condition 0, the seas are calm or glassy and there is no wave activity. At the other end of the scale, sea state 9 has phenomenal waves that are over 45 feet high.)

Fueling at sea is accomplished using hoses that are supported by cables that connect the vessels. The Navy uses a fuel called JP5 for its aircraft. JP5 is similar to JP8, except that JP5 has a higher flashpoint than JP8, making it less likely to cause shipboard fires. Therefore, JP5 is an acceptable substitute for use in Army aircraft and ground vehicles when JP8 is unavailable. Non-nuclear Navy ships use bunker fuels, which are various kinds of commercial fuels. Although ship propellant fuels should not be used for Army aircraft, they may be suitable for use in military ground vehicles for short periods of time. Army Regulation 70–12, Fuels and Lubricants Standardization Policy for Equipment Design, Operation, and Logistic Support, has details on the use of fuels and additives.

Though most naval resupply is by sea, fixed-wing aircraft also sustain naval forces. The C–2A Greyhound is a cargo aircraft designed to land on aircraft carriers. Resupply by this method is called carrier on-board delivery. The C–2A can transport a payload of 10,000 pounds. The S3–B Viking is also capable of carrier on-board delivery and can provide in-flight refueling to other aircraft.

Like the Air Force, the Navy, through its Reserve forces, operates the C–130 cargo plane, which can deliver cargo to fixed airfields, including unimproved runways. The newest version of the C–130 has a maximum cargo capacity of 46,812 pounds.

The Navy also operates a number of other types of aircraft. The C–9 Skytrain can haul both passengers and cargo or 40 litter patients and 40 ambulatory

patients. The C–40A Clipper is certified to operate in an all-passenger configuration (121 passengers), an all-cargo configuration, or a combination configuration that accommodates 3 cargo pallets and 70 passengers on the main deck. The C–20 Gulfstream can serve as a cargo aircraft, although its primary role is transporting dignitaries. The C–12 Huron, which provides logistics support between Navy air stations, can deliver a payload of 4,215 pounds.

Navy Transformation

The Navy's overarching transformation guidance and vision is published in Sea Power 21, Projecting Decisive Joint Capabilities, which outlines how the Navy will organize, integrate, and transform to meet the challenges of the century ahead. The Naval Operating Concept (NOC) for Joint Operations describes how the Navy and Marine Corps team will train, organize, deploy, and sustain a more capable and ready force through 2020 as part of the Joint Force. These documents explain the concepts of Sea Strike, Sea Shield, and Sea Basing.

According to the NOC, Sea Strike is a broad concept for projecting precise and persistent naval offensive power. Sea Shield describes the manner in which naval forces will protect our national interests with layered global defensive power. Sea Basing is the foundation from which offensive and defensive power is projected, making Sea Strike and Sea Shield realities. It will provide joint force commanders with global command and control capability and extend integrated support to the other services. The emerging joint concepts associated with Sea Basing will have a profound impact on future joint warfighting logistics concepts.

Blue and Brown Water Navies

Naval forces designed to control the deep waters of the seas are known colloquially as the "Blue Water Navy." Since the demise of the Soviet Union, the Navy has had unprecedented dominance of the oceans of the world. While maintaining dominance is a priority, the Navy also seeks to assert more influence over the world's coastal areas, both seaward and landward. The land and sea adjacent to a coast is known as a littoral.

Naval forces operating near littoral areas are known colloquially as the "Brown Water Navy." Some Navy documents state that the littoral can be as far inland as 650 miles, which is the maximum distance accessed by Navy aircraft based at sea. Therefore, littoral areas are tied to the ability of Navy forces to exert influence.

In order to implement emerging doctrine, the Navy will field advanced equipment. The Littoral Combat Ship (LCS), currently under development, will operate in and ensure access to littoral areas. The LCS will be smaller than other combatant ships (cruisers, destroyers,

and frigates) and will be capable of self-deployment over strategic distances (up to 4,300 nautical miles) without refueling. Its primary missions will be to intercept small, fast surface craft; implement mine countermeasures; and conduct antidiesel submarine warfare. It will be capable of operating in shallow waters since its draft will be about 10 feet. It will attain speeds of 50 knots, accommodate 75 passengers, and require a core crew of as few as 15 sailors. An LCS squadron will consist of five LCSs.

Like the Army, the Navy is interested in the development of high-speed vessels (HSVs) and larger theater support vessels (TSVs). These are being designed to transport battalion-sized forces within a theater at speeds nearing 50 knots.

The V–22 Osprey, currently under development, will have an intratheater airlift mission. The V–22 is a tilt-rotor aircraft that has the speed, range, and fuel efficiency of a turboprop aircraft and the vertical takeoff, landing, and hover capabilities of a helicopter. Using a dual cargo hook, it can lift 15,000 pounds.

Organizations involved with Navy logistics transformation include the Deputy Chief of Naval Operations, Fleet Readiness and Logistics (N–4), who is similar to the Army's Deputy Chief of Staff, G–4, and the Chief of Naval Education and Training (CNET), who is equivalent to the Commander of the Army Training and Doctrine Command. CNET is responsible for the education and training of all Navy and Marine Corps personnel. The Navy Warfare Development Command (www.nwdc.navy.mil) is the Navy's proponent for concept development and experimentation.

As military doctrine, planning, execution, and logistics become increasingly joint, Army logisticians who understand the organizational structure, means of force employment, sustainment methods, and transformation goals of the Navy will not only be better informed, but also may be able to use this knowledge to obtain logistics-related support from naval forces operating in adjacent, littoral areas. **ALOG**

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Army Packaging Policy Work Group

BY F. BARRY BRYANT

The need for an effective, proactive Army packaging management group and its importance to the success of logistics operations have been recognized since before World War II. Many noteworthy technological, policy, training, and operational events and milestones have marked the evolution of the packaging discipline. The most recent event in this evolution was the establishment of the Army Packaging Policy Work Group (APPWG) by the Department of the Army (DA) as a viable intra-Army committee. Equally notable is the fact that, for the first time, the committee's chairmanship is vested in the DA G–4.

Army Packaging Board

A look at the APPWG's development helps explain the significance of its sanctioning. The APPWG replaces the Army Packaging Board (APB), which was established in 1944 to assist in the development of packaging policy. The primary APB functions included providing guidance on the organization of Army packaging activities; standardizing packaging materials, methods, testing, and procedures; procuring packaging; reducing packaging costs; and training packaging personnel.

Between 1945 and 1960, the APB initiated testing procedures for standardized packaging. In the mid-1960's, the board concentrated on stock readiness and the readiness of packaging operations. From 1970 to 1991, specific areas of interest included packaging modernization, packaging procurement costs, vehicle processing, and pre-positioning of materiel in Europe. APB meetings stopped in November 1991, resumed in July 1993, and continued through 1995, when they were suspended because personnel cutbacks in many Army organizations reduced participation. The Army regulation that implemented the committee was rescinded, effectively dissolving the APB.

APPWB Establishment

Efforts to reestablish a packaging authority began after the May 1997 Quadrennial Defense Review stated that the Department of Defense (DOD) "will trim current forces primarily in the 'tail' (support structure)." To that end, the Army Materiel Command (AMC) created a program management plan for a Virtual Integrated Materiel Management Center.

As a part of that plan, AMC created a packaging business process improvement focus group (BPI FG) to conduct a comprehensive review of all aspects of prevailing packaging policy throughout AMC. The BPI FG determined that there was a critical need to update and standardize packaging policy and to integrate its components into overall logistics, acquisition, and engineering planning policy, particularly at the major Army command (MACOM) level. Consequently, the BPI FG recommended the institution of an Army packaging management group to consolidate and manage packaging policy and to serve as a formal decisionmaking group overseeing Army packaging. The group would provide guidance and recommendations for packaging research, development, testing, and evaluation; support acquisition reform initiatives; pursue packaging cost reductions; promote packaging safety; foster sound packaging ecological and environmental practices; assist unit personnel with materiel readiness issues; and review and promote extensive personnel training programs.

Another consideration that led to the recommendation for a packaging management group was the need to support three other important ongoing logistics initiatives: Total Asset Visibility, Integrated Sustainment Maintenance, and the Single Stock Fund Program. A formal packaging focal point would facilitate the implementation of the packaging requirements of these initiatives.

The BPI FG also recognized that, if a packaging policy group were to provide a total Army perspective, achieve its stated goals, and be able to implement the aforementioned initiatives, it must be established and chaired at the DA level. The BPI FG's final recommendation included the specific provision that the DA G–4 provide the chairman for a group of Army representatives who would address packaging and packaging-related issues.

The BPI FG further recommended that a packaging representative from the AMC Logistics Support Activity (LOGSA) Packaging Storage and Containerization Center (PSCC) serve as the deputy chairman of the group. The deputy chairman's responsibilities would include coordinating meetings; preparing the agenda, minutes, and correspondence for DA approval; and tracking and reporting on directed actions. Most importantly, the deputy chairman would provide technical expertise to the chairman and the group itself.

The deputy chairman's first act was to implement the BPI FG's recommendations. In May 2000, DA directed the PSCC to formally establish an Army packaging group, which became known as the Army Packaging Policy Work Group.

Group Accomplishments

The first meeting of the APPWG took place in January 2002 in Scranton, Pennsylvania. In addition to the DA G–4 chairman and PSCC deputy chairman, the work group consisted of MACOM representatives, representatives from the packaging training community, AMC senior packaging experts, and commodity managers. It also included technical experts from storage and maintenance activities and data and document activities.

The group's first order of business was to develop a charter. A committee was formed to draft a charter, staff it, resolve comments, and present it to DA for approval. Within a month after the first APPWG meeting, DA approved an interim charter, which was incorporated into an Army-specific pamphlet staffed by the Army Logistics Integration Agency.

Army Transformation became the APPWG's first priority. The Army Chief of Staff's vision for the Transformation Campaign Plan (TCP) states, "In terms of sustainability, the logistics footprint will be reduced. For this to occur, the number of vehicles deployed must be controlled, reach capabilities must be leveraged, weapons and equipment [must be] designed in a systems approach, and projection and sustainment processes [must be] revolutionized."

The APPWG realized that the Army would need packaging innovations to achieve the strategic requirements of this vision. Therefore, in its first two meetings, the APPWG reviewed the way items were currently packaged and what changes were needed to support the Army Transformation mission. The result was a list of 20 proposals based, in part, on new technology and breakthroughs in packaging science. They encompass changes in materials and equipment, modifications in packaging procedures and practices, and establishment of training programs. The proposals have great potential; however, Army-wide validation and acceptance are still needed. PSCC was designated to prioritize, research, develop, evaluate, and implement the most worthy proposals and is currently seeking funding to accomplish these initiatives.

While training programs are being established to support the implementation of the TCP, the APPWG's chartered training objective is ongoing. Both the Army Quartermaster Center and School at Fort Lee, Virginia, and the School of Military Packaging Technology at Aberdeen Proving Ground, Maryland, are active members of the APPWG and have the group's endorsement. The APPWG charter states that the group "will provide a forum for advising the U.S. Army Training and Doctrine Command (TRADOC) on the development and improvement of training pertaining to packaging and recommend how their programs can respond to Army needs."

The Quartermaster School, after coordinating with the School of Military Packaging Technology, is exploring the expansion of packaging training in its program of instruction (POI). The Quartermaster School representative explained to the APPWG that current packaging training serves as a good introduction to packaging basics for the soldier. However, Milestone 3 of the Single Stock Fund Program requires soldiers at the troop installation level to pack assets properly for worldwide shipment, so a more comprehensive POI may be needed. To further support the POI expansion and to augment its present staff, the Quartermaster School expressed the desire to add a School of Military Packaging Technology instructor to its staff to teach packaging to beginning students. DA directed the school to pursue this action through the proper TRADOC channels.

Other accomplishments during the APPWG's first year included—

• Publishing the G–4's policy for implementing the measures of the European Community and the United Nations International Plant Protection Commission for controlling the spread of insects by using solid wood packaging material.

• Developing a Web site for posting DOD and Army packaging information. The group is continually updating the Army packaging Web page as well as adding interfaces with all packaging data on Army Knowledge Online.

• Directing the expansion of the Stock Readiness Program.

• Reestablishing communications among the various integrated materiel management centers and research, development, and engineering packaging communities.

• Maximizing customer support throughout the distribution pipeline by addressing the need for training on the use of appropriate packaging equipment, supplies, and automation.

On 15 January 2003, the APPWG officially became an intra-Army committee. This was truly the culmination of years of endeavoring to achieve and maintain DA recognition. The APPWG will continue to build on the foundation fashioned by all the packaging groups that preceded it. **ALOG**

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Data Validator Aids Property Book Conversion

BY MARSETTA BEARDEN

Property book officers (PBOs) tasked with converting their units' property books from the Standard Property Book System-Redesign (SPBS–R) to the Property Book Unit Supply Enhanced (PBUSE) now have a tool that will make their jobs a lot easier. The PBUSE Data Validator, developed by the Army Materiel Command Logistics Support Activity (LOGSA), identifies errors that can be corrected easily by PBOs and provides visibility of all major items and selected secondary items in the Army.

Development of the Data Validator started in 2000, when LOGSA began working with the Program Manager for the Global Combat Support System–Army (PM GCSS-Army), the Army Combined Arms Support Command (CASCOM), and TRW, Inc. (now Northrop Grumman Electronic Systems), to develop a Web-based property book for the Army. After initial testing and fielding, the system was modified to include Unit Level Logistics System–S4 users. LOGSA currently is working with the PM for Logistics Information Systems, CASCOM, and Northrup Grumman to test software that will convert Defense Property Accounting System users to PBUSE.

Fielding of PBUSE across the Army is a critical support mission performed by LOGSA for the PM GCSS-Army. LOGSA has participated in many system acceptance tests to ensure that functional requirements for data quality, edits, and interfaces to LOGSA systems are accurate and functioning as intended. LOGSA also has partnered with CASCOM on several system deployments to Active Army, Army National Guard, and Army Reserve units in and outside of the continental United States.

The Web-based PBUSE enhances the way today's Army does business. PBUSE not only improves property accountability and data integrity but also eliminates the need for Continuing Balance System-Expanded (CBS–X) reporting and Unique Item Tracking (UIT) system reconciliations. PBUSE fully supports serial number tracking, mobility planning, and national-level redistribution. Here's how it works.

Before converting to PBUSE, a PBO first must validate critical data in his unit's property book, such as line item numbers, serial numbers, and registration numbers. To speed up identification and correction of data errors before beginning the conversion process, he accesses the PBUSE Data Validator, on the Web at http://weblog.army.mil.

The PBO then uploads the SPBS–R Property Book Master File, and, as part of the preconversion process, the PBUSE Data Validator systematically identifies discrepancies in UIT, the Army Maintenance Management System Equipment Database, the Readiness Integrated Database, and asset balances.

The PBO must correct discrepancies identified by the PBUSE Data Validator before the unit's data can migrate into the Logistics Integrated Data Base (LIDB) and PBUSE production tables. Until all data integrity issues are resolved, migrating unit identification codes are placed in a "hold" table within LIDB and changes to the unit's authorization and asset posture are not processed. The Data Validator prevents the incorrect identification of assets, which can adversely affect UIT reporting, national-level asset visibility, and the accuracy of chief financial officers' reports. The Data Validator also helps prevent redistribution problems that can occur if assets are identified incorrectly as excess to national-level decisionmakers. Most importantly, it helps ensure that incorrect asset locations registered within the LIDB will not generate reports of shortages that could be passed on to the National Inventory Control Point Class VII Major Item Requisition Validation file. If such shortages are reported, valid requisitions for class VII (major end items) may be rejected, thus lowering unit readiness.

More than 3,000 unit identification codes have been converted from SPBS–R to PBUSE. Feedback from PBOs using LOGSA's Data Validator tool when converting from SPBS–R to PBUSE has been extremely positive. Web-based PBUSE will be fielded in all Active Army, Army National Guard, and Army Reserve units by 30 September 2006.

For more information about the PBUSE Data Validator, contact LOGSA at helpdesk@logsa.army.mil or call (256) 955–7716 or DSN 645–7716.　　**ALOG**

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Logistics Assistance Representatives in the 'Second to None' Division

BY LIEUTENANT COLONEL KENT S. MARQUARDT AND JAMES W. ROSE, JR.

Have you ever had a logistics assistance representative (LAR) in your organization? If you have, I'm sure you will be able to relate to these sentiments expressed by a 2d Infantry Division infantry battalion maintenance soldier as he was heading to a new assignment—

> Sir:
>   I would like to send my appreciation to you for an awesome LAO [logistics assistance office] team. Throughout my last year here, there were numerous occasions when I needed assistance from the LARs. They bent over backward for my unit and me. It didn't matter if I needed the assistance during the day, at night, or even on a weekend, they were always there. They always provided me with an answer when no one else could. I only hope I have the same quality assistance at my new unit as I did here.

LARs are civilians who are hired under the provisions of the Army Logistics Assistance Program (LAP) by the Army Materiel Command's (AMC's) Tank-automotive and Armaments Command (TACOM); Aviation and Missile Command (AMCOM); Communications-Electronics Command (CECOM); and Soldier and Biological Chemical Command (SBCOM). The LARs, who usually are retired warrant officers or senior NCOs, know everything about their unit's equipment. They provide answers to maintenance, training, and parts questions. They are the "go-to" guys for answers to operational readiness questions. They have been there and know what's what. This is especially true of the LARs in the Logistics Assistance Office in U.S. Forces Korea's 2d "Second to None" Infantry Division (LAO–2ID).

What the 2ID LARs Do

The goals of the LARs in the LAO–2ID are to—
- Resolve customers' technical, logistics, and training problems.
- Be aggressive, proactive, visible, responsive, and approachable.
- Represent the AMC Commander on all issues pertaining to logistics.
- Coordinate and maintain visibility on all AMC activities in the 2ID area of operations.
- Act as the single point of contact for the exchange of information between customers and AMC.
- Manage the LAP in the 2ID area.
- On order, deploy with their units.

The primary mission of the LAO is to improve and sustain readiness. This is accomplished through maintenance and supply assistance and training and readiness analysis and research (analyzing problems and finding solutions). Maintenance LARs spend most of their time troubleshooting equipment and providing refresher training. Supply LARs and logistics management specialists chase parts, identify long lead times and their causes, find alternative sources of supply, and expedite release and shipment of materiel. Wholesale supply availability and the sheer geographic distance from the wholesale supply sources contribute greatly to the constant supply challenges that occur on the Korean peninsula.

The 2ID is forward deployed in the demilitarized zone in the northern section of South Korea. LAO–2ID is dispersed among six different installations in Korea's western corridor. Because of the LAO–2ID's high operating tempo and real-world mission, most assigned LARs have never had time to be deployed off the peninsula.

Despite the geographic dispersion of the customer units, the expertise and dedication of the assigned LARs were directly responsible last year for a $7.8 million cost avoidance on repair parts and materiel for the 2ID. The LARs also provided 1,047 hours of informal supply and maintenance training to 2,369 soldiers. All of this was accomplished while working under increased force protection conditions imposed after 11 September 2001.

Support of Field Training Exercises

The LAO–2ID LARs also provide consistent, high-quality, onsite support to more than a dozen individual unit gunnery exercises per year, as well as to theater-,

division-, and brigade-level exercises such as Ulchi Focus Lens; Reception, Staging, Onward Movement, and Integration (RSO&I); and Foal Eagle.

During RSO&I 2003, Task Force 2–34 armor personnel from the 1st Brigade, 1st Infantry Division (Mechanized), from Fort Riley, Kansas, drew 28 M1A1 tanks from Army pre-positioned stocks (Pacific) (APS–4) at Camp Carroll, Korea, to exercise and validate the APS–4 equipment. TACOM LARs from LAO–2ID were onsite at Camp Carroll to assist with the draw. The tanks were transported to Camp Casey and then driven 35 miles to the Rodriguez Live-Fire Complex for screening. Following the firing, they were carried on heavy equipment transporters back to the Camp Casey railhead. TACOM LARs provided outstanding onsite support throughout the entire screening phase and the exercise.

Hands-On Training

In response to a 2ID request that the LARs verify the condition of suspected unserviceable major assemblies before they were replaced, TACOM automotive and armament LARs and AMCOM aviation and missile LARs established a hands-on program for troubleshooting engines, transmissions, and major line-replaceable units. Under the program, items are either verfied as unserviceable or are repaired and returned to service. This program has significantly reduced the division's annual cost for major assemblies and has increased the skill level of the unit inspectors.

A key component of the LAO mission is providing technical training to help soldiers overcome readiness challenges. The typical tour for 2ID personnel is only 1 year, and many soldiers assigned to Korea are recent advanced individual training graduates who have very little experience. LARs provide continuity in the unit, filling the gaps and providing critical training the soldiers need to improve their skills and abilities.

LARs teach many classes throughout the year on a variety of subjects, but three training programs stand out above the rest. They are the School of the HEMTT [heavy, expanded-mobility tactical truck], Mobile STAMIS [Standard Army Management Information

A 2ID LAR instructs Army personnel on the operation and maintenance of the heavy, expanded-mobility tactical truck.

Systems] University, and the School of the HMMWV [high-mobility, multipurpose wheeled vehicle]. Each of these training events presents maintenance personnel and operators with a systemic and technical overview of the subject under study. The objective is to prepare new soldiers for smooth assimilation into their units and make them productive as quickly as possible.

The forward deployed LAOs in 2ID are aggressive, committed, assertive, motivated, and responsive to the division's logistics requirements. LARs bring a wealth of experience and knowledge to the division that enables the LAO–2ID to stay relevant and make a difference every day it supports the "Second to None" Infantry Division. **ALOG**

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The Change of Command Inventory: Planning for Success

BY MAJOR RICHARD J. HORNSTEIN

The author offers guidelines to help make the often painful process of conducting a change of command inventory less stressful for an outgoing company commander.

Commanding a company was, without a doubt, the most challenging and rewarding job I have had in the Army thus far, but it also was very stressful. One of the primary stresses was property management. Managing the property of a large maintenance company was extremely time consuming and difficult. The previous two commanders of my company had large reports of survey initiated against them following their change of command (COC) inventories, and they lost pay because of the property losses. This happens too often, and COC inventories that result in a report of survey with findings against the commander affect not only his wallet but also his officer evaluation report. Few senior raters consider lack of property accountability an attribute of an above-average commander. The COC inventory is the outgoing commander's responsibility, and how well he plans for this event can help ensure its success.

Preparation

The following tips can help a future company commander prepare adequately for the tough job of conducting a COC inventory.

Seek an in-brief with the battalion commander before beginning the inventory. The battalion commander should provide comprehensive guidance to the incoming and outgoing company commanders. The information can be provided in a memorandum that is distributed to both commanders. It should be followed up with a meeting to discuss and review the guidance, the schedule, and any other issues or questions the company commanders may raise. My battalion commander did this, and it provided a professional atmosphere and demonstrated that the inventory was also a priority of the battalion's senior officer. He also required both the incoming and outgoing commanders to brief him daily on the progress of the inventory and on any problems that may have surfaced that he could help with.

Publish the inventory schedule. The sub-hand receipt holders should know well in advance that the COC inventory is looming, so it should come as no surprise to them. A schedule identifying the time, the place, and the responsible parties needs to be published before the inventory so that all the people involved are adequately prepared. While in command, you should hold monthly hand receipt meetings to disseminate information and resolve property issues. Use these meetings to deconflict sub-hand receipt holders' schedules for the COC inventory and resolve any additional issues.

Conduct a pre-COC inventory. The outgoing commander must conduct a pre-COC inventory if he wants a successful COC inventory. Conducting a full pre-COC inventory may not always be feasible, depending on the amount of property, the training schedule, and the time needed to conduct a thorough inventory. However, at the very minimum, every nonexpendable item needs to be accounted for. A nonexpendable shortage mandates a report of survey unless the item is recovered, so ensure that these articles are on hand. All sub-hand receipt holders should update their shortage annexes and re-sign their hand receipts before the actual COC inventory. If nonexpendable shortages are identified during the pre-CEC inventory, initiate any reports of survey required.

The purpose of the pre-COC inventory is to make administrative corrections to the property book and identify and resolve possible problems before the actual COC inventory. Conducting the pre-COC inventory also protects the sub-hand receipt holders. The outgoing commander has the opportunity to resolve shortfalls and realign any excess property available within the company to protect the sub-hand receipt holders from possible monetary losses. While you are the company commander, ensure that every item on the company's property book is sub-hand receipted. Your signature should be on only the master hand receipt.

The supply sergeant should sign for all additional property that comes in during the incoming and outgoing COC inventories and subsequently issue it to the appropriate shop or section hand receipt holder.

Make the supply sergeant available. The supply sergeant's focus in life should be the upcoming inventory. Its success is a direct reflection of how well he has done his job. He should ensure that all shortages are on order, and he should have a valid document or order number for them on record and annotated on the associated shortage annexes.

The Internet provides a great resource for supply catalogs, so there should be no excuse for any missing supply catalogs during the inventory. Charge your supply sergeant and supply officer with maintaining visibility of updated supply catalogs. To preclude discrepancies in future inventories, ensure that the date of the catalog is indicated on the sub-hand receipts.

Involve unit lieutenants at every level. Appoint your executive officer or another responsible individual to be your supply officer and oversee supply operations. Have this individual report directly to you daily to keep you updated on all property issues. Also, use your platoon leaders to prepare for the inventory. Have them participate in the monthly inventories and the pre-COC inventory. Involve them in the platoon's property management, and use their support forms to tie their success to their platoon's property. This both increases their awareness of a critical leadership task and increases supervisory accountability of the company's property.

Have warrant officers sign for property when possible. Noncommissioned officers (NCOs) are quite capable of signing for property; however, in a supply or maintenance company, the NCOs turn over more often than the warrant officers do. Warrant officers also become much more concerned with property when they have signed for it. They also have more experience with the property. For example, the warrants are often more familiar with the unique tools that are included in the shop sets, kits, and outfits than the NCOs. They, in turn, can sub-hand receipt their property down to the user level and tie their NCOs' performance in managing property accountability to the NCO evaluation reports.

Conducting the COC Inventory

Adhering to a plan is the key to the inventory's success. This often requires the supply room personnel, supply officer, and all sub-hand receipt holders to work some extra hours in order to stay on track during the inventory. The additional hours usually stem from ensuring that the sub-hand receipts for property inventoried during the day are adequately updated and re-signed before concluding for the day. However, the actual physical count should be completed during duty hours.

Draft and sign statements of charges for durable and expendable unresolved shortages. Always keep a running tally of the total cost of losses identified. Keep the battalion commander aware of the inventory's progress and of any losses—especially high-cost and nonexpendable losses. Remember that a nonexpendable loss will always require a report of survey and cannot be accounted for unless the property book officer (PBO) has signed a shortage annex for the commander identifying the loss.

A close relationship with the PBO is important for any commander. This relationship should be established as soon as possible. The incoming company commander should visit the PBO before conducting the COC inventory. He should ask the PBO about the status of property in the company and any previously identified long-standing issues of accountability or excess property.

The outgoing and incoming commanders who follow these procedures to prepare for and execute a COC inventory will enjoy greater success. Following this guidance will reduce their stress and streamline the overall inventory process. COC inventories in most supply and maintenance companies are grueling, tedious, and time consuming. They also are the first impression that the incoming commander will get of the company and its leadership. While you are a company commander, involve the chain of command within the company in property accountability and always stress its importance at every level.

Safeguarding the property of the Army is serious business. The commander cannot shoulder the burden of property accountability alone. Commanders who feel that they can accomplish this mission singlehandedly frequently fail and suffer large reports of survey at the conclusion of their commands. This capstone event in a company command is important, and it is frequently a deciding factor in how the officer's performance will reflect on his evaluation. **ALOG**

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Logistics in the Japan Ground Self-Defense Force

BY LIEUTENANT COLONEL MASAHIRO FUKUDA, JGSDF,
AND LIEUTENANT COLONEL ROBERT O. BOSWORTH, USA

Because the stability of the Asia-Pacific region is of vital interest to both nations, Japan and the United States have maintained a strong alliance for over 50 years. As the Japan Ground Self-Defense Force (JGSDF) transforms to face the challenges of the 21st century, it must confront logistics support issues similar to those the U.S. Army is facing as it transitions to the Objective Force. Reducing the logistics footprint, increasing efficiency, enhancing responsiveness, and minimizing the cost of logistics without sacrificing readiness are among the challenges the JGSDF faces. This article provides an overview of JGSDF logistics and examines some recent JGSDF logistics initiatives and logistics transformation concepts under consideration.

Force Structure

Japan's National Defense Program Outline (NDPO) defines the basic structure of the JGSDF, the Japan Maritime Self-Defense Force (JMSDF), and the Japan Air Self-Defense Force (JASDF). The 1995 revision of the NDPO directed the JGSDF to complete a restructuring effort by the end of Japan Fiscal Year (JFY) 2008 (1 April 2008 through 31 March 2009). That restructuring reduces its force to 8 divisions, 1 armored division, 6 brigades, 1 airborne brigade, 1 helicopter brigade, 900 tanks, 900 artillery systems, 145,000 active-duty personnel, and 15,000 reserve personnel. Now in a period of transition, the JGSDF currently has 10 divisions, 1 armored division, 2 brigades, 2 combined brigades, and approximately 156,000 active-duty personnel and 10,000 reserve personnel.

The JGSDF is composed of five regional armies, each with a varying number of infantry and armor divisions, brigades, and regiments. A regional army also has organic brigade-sized field artillery, engineer, signal, and air defense artillery elements. Typically, JGSDF units are smaller than their U.S. Army counterparts. A JGSDF division has 6,000 to 9,000 personnel compared to 10,000 to 15,000 for a U.S. Army division. Although the JGSDF does have battalions in its divisions and brigades, there are none in its infantry and armor regiments. The companies within these regiments report directly to the regimental headquarters.

The Japanese use the term "tai," or "unit," for elements that do not fit the parameters for companies, battalions, regiments, groups, brigades, or divisions. A unit can vary in size from several squads or platoons of approximately 55 personnel, as is the case in a division logistics support regiment's transportation unit, to approximately 460 personnel, which is typical of the transportation unit of a regional army's logistics support element.

Key JGSDF Logistics Components

The Japan Defense Agency (JDA), Japan's equivalent to the U.S. Department of Defense, is located in Ichigaya, a section of central Tokyo. The Ground Staff Office (GSO), equivalent to the U.S. Department of the Army, is the JGSDF's headquarters staff element in the JDA. Key components of the JGSDF's logistics structure include the GSO's Logistics Department, the Central Transportation Management Command, the Ground Materiel Control Command, and the JGSDF depot system.

The Logistics Department of the GSO is similar to the U.S. Army's Deputy Chief of Staff, G–4. The Director of the Logistics Department, a major general, reports to the Chief of Staff of the JGSDF, a general. The Logistics Department has eight divisions. The Logistics Management Division is responsible for overall coordination of logistics planning; the Ordnance and Chemical Division for maintenance, ammunition, and chemical equipment; the Communications and Electronics Division for signal and communications equipment and electronic systems, including radar and fire control systems; the Aircraft Division for JGSDF rotary-wing aircraft maintenance management; the Quartermaster Division for supply and field service support; the Engineer Division for engineering support; the Transportation Division for transportation support; and the Materiel Research and Development Division for ground force equipment research and development. The Materiel Research and Development Division works with the

A CH–47J helicopter transports a type-73 truck to the Higashi Fuji Training Area near Mount Fuji in Honshu.

JDA's Technical Research and Development Institute, which manages the design, development, testing, and production of all JGSDF equipment and materiel.

A regional army coordinates and manages the transportation of equipment and supplies within its area of responsibility. If items are to be transported beyond the regional army's area by a means other than road movement, the Central Transportation Management Command in Yokohama coordinates and manages transportation requirements. The Central Transportation Management Command manages interregional army transportation and nationwide JGSDF rail, air, and maritime transportation.

The Ground Materiel Control Command is headquartered at Jujo Station in Kita-ku, about an hour north of Tokyo. It oversees the JGSDF depot system, controls JGSDF nationwide depot support, maintains visibility of all depot stocks, and directs cross-leveling operations. The Ground Materiel Control Command ensures that controlled components, such as engines and transmissions, and intensively managed items are stocked at regional army depots. This ensures proactive support of aviation units, Hawk air defense artillery units, and other JGSDF elements that require time-sensitive, specialized repair parts support.

One JGSDF initiative to minimize logistics costs without sacrificing readiness was the realignment and restructuring of its depot system. The former system included 10 depots: 5 central depots for quartermaster, ordnance, engineer, signal, and medical support and 5 regional army depots. The restructured JGSDF depot system has five depots, one aligned with each regional army. The five former central depots were reorganized under the Kanto Depot at Kasumigaura Station, Honshu, which is aligned with the Eastern Army. Kanto Depot also serves as a central depot and provides backup support to the other depots.

Each depot provides maintenance support and supply support to its associated regional army. Depot maintenance support includes special technical inspections of electro-optical equipment (components and systems with associated electronics for optical modulation and optical scanning systems), communications equipment, radar systems, and missile systems and overhaul of engineer equipment, main battle tanks, helicopters, field artillery systems, and wheeled vehicles. Servicing of parachutes, oversight of ammunition storage sites and bulk petroleum storage facilities, and receipt, storage, and distribution of supplies are included in supply support.

Regional Army Logistics Support Unit

Realignment of logistics support at the regional army and division levels is designed to reduce the JGSDF logistics footprint. Support at the regional army level previously included a separate ordnance battalion with maintenance personnel, a transportation unit with supply and maintenance personnel, and other units with supply and maintenance personnel for supporting the regional army's elements.

Today, each regional army relies on its logistics support unit for supply, field service, maintenance, and transportation support. Support battalions are aligned in a direct support role with each field artillery, engineer, signal, and air defense artillery brigade of the regional army. A general support battalion with up to three maintenance and supply companies supports other army elements, including general service units and prefectural liaison offices. (Japan is divided into 47 administrative divisions called "prefectures.")

The logistics support unit's transportation unit, formerly a table of organization and equipment unit, is now a table of distribution and allowances unit. The number of trucks in a regional army transportation unit is based on the number of units supported. The transportation

Northern Army soldiers prepare rice for a meal during a field training exercise at the Kami Furano Training Area in Hokkaido.

units of the Northern and Eastern Armies have three truck companies. The Northeast, Middle, and Western Armies have transportation units with one truck company each. In general, the transportation units are authorized 36 type-74 cargo/troop transport trucks, each with 10.5-ton capacity, per truck company.

Logistics Support Regiment

Each division within a regional army receives logistics support from its organic logistics support regiment. The regiment's structure is based on the type of division it supports. The typical structure of a logistics support regiment includes a headquarters and headquarters company (HHC), a supply unit, a transportation unit, a medical unit, a type A maintenance battalion, and a type B maintenance battalion.

The HHC provides administrative and logistics support to the regimental headquarters. The supply unit provides repair parts support, while the transportation unit provides transportation support. The medical unit provides ambulance support, medical care, and medical supply and maintenance support. The type-A maintenance battalion provides support for divisional combat support units such as the engineer and signal units. The type-B maintenance battalion provides support for combat arms units of the division.

The transportation unit of a logistics support regiment is authorized various numbers of type-73 6-ton cargo/troop transport trucks. The number of trucks it is authorized is based on the type of division it supports. In general, a logistics support regiment's transportation unit is authorized approximately 50 type-73 trucks to support a division.

The previous division-level support concept included separate units for maintenance and supply in direct support of each combat arms element. Under that concept, a mechanized infantry division had a direct support maintenance company and a direct support supply company for each of its combat arms units (infantry, armor, field artillery, air defense artillery, and reconnaissance). In effect, there could have been as many as 10 direct support logistics companies in a division for the combat arms elements, in addition to the separate general support maintenance and supply units for the combat support and combat service support elements. A reorganization consolidated maintenance and supply personnel into one company for each combat arms element, significantly reducing the division's logistics footprint.

The headquarters and service company (HSC) of a combat arms regiment in a division provides organic logistics support to the regiment. The HSC consists of a company headquarters, a regimental headquarters section, an intelligence section, a signal platoon, an engineer platoon, a maintenance platoon, a supply platoon, a medical platoon, and a transportation platoon with 12 type-73 trucks.

Brigade Logistics Support Unit

The JGSDF currently has four separate brigade-sized elements aligned with the regional armies. There are two combined brigades: the 1st Combined Brigade, which is assigned to the Western Army in Okinawa, and the 2d Combined Brigade, which is assigned to the Middle Army in Shikoku. The other two brigades are the 12th Brigade, which belongs to the Eastern Army in Honshu, and the 13th Brigade, which belongs to the Middle Army, also in Honshu.

The logistics support units for these brigades vary in size and structure based on the type of brigade being supported. The 12th Brigade, an airmobile brigade, has a helicopter unit with OH–6J observation helicopters, UH–60JA utility helicopters, and CH–47J cargo helicopters. The 12th Brigade's logistics support unit includes a headquarters and headquarters unit, a medical unit, a transportation unit, a direct support maintenance unit, a general support maintenance unit, a supply company, an engineer company, and a signal company.

JGSDF Logistics Support Concept

JGSDF logistics doctrine encompasses four areas: base maintenance, maintenance, forward support, and forward maintenance. The base maintenance area includes national-level logistics assets such as seaports, airports, railroads, the industrial base, the Ground Materiel Control Command, and the Central Transportation Management Command. The base maintenance area constitutes the central level of JGSDF logistics.

The maintenance area is located at the Army level of JGSDF logistics. It is a logistics support area established in the rear area of a regional army from which maintenance, medical, transportation, supply, and field service support are provided to units throughout the regional army. Assets such as the regional army depot, the regional army logistics support unit, and general service units that are integral parts of the logistics support structure at the army level are used in conjunction with the maintenance area to support the regional army.

The forward support area is established in the regional army's forward area of operations. It serves as a support base for maintenance, medical, transportation, supply, and field service support to units in the regional army area. It also serves as a point from which logistics support is pushed forward to the division area.

The forward maintenance area can be established when an intermediate logistics support area is needed between the maintenance area and the forward support

area. The forward maintenance area is located at the army level of JGSDF logistics. The level of logistics and medical support provided is not as robust as that provided by the maintenance area, but it can be more comprehensive than the level of support provided by the forward support area.

The central, army, and division levels of support are fundamental aspects of JGSDF logistics. The JGSDF provides support to its units using national assets such as seaports, airports, railroads, and the industrial base, together with its regional army logistics support units, division logistics support regiments, and regimental headquarters and service companies.

The JGSDF logistics infrastructure is limited by design. The Constitution of Japan permits the maintenance of a self-defense force capability that functions at the minimum level needed to preserve the security of Japan. Unlike logistics elements of the U.S. Army that are designed to support a power-projection force anywhere in the world, JGSDF logistics support elements are designed to operate solely on Japanese territory. To augment its logistics support capabilities in times of national emergency, the JGSDF uses fixed elements of Japan's infrastructure, including JGSDF hospitals, to provide support to its forces.

Tactical medical support within the JGSDF is limited. The logistics support regiment of each division has a medical unit that is authorized approximately 80 personnel. This includes one field surgery system with accompanying surgeon and medical support staff. External to the division, JGSDF medical units are assigned to the regional army to support JGSDF elements in the regional army's area of responsibility.

The Japan Self-Defense Force maintains 15 hospitals throughout Japan to support its personnel and their dependents. The hospitals provide comprehensive medical support, including specialized surgery and medical care. In case of a national emergency, the JGSDF medical infrastructure and the Japan Self-Defense Force hospital network augment the medical units within the JGSDF.

Emerging JGSDF Logistics Initiatives

Three concepts are being considered to help the JGSDF reduce costs, improve efficiency, and leverage technology: a logistics headquarters, logistics support brigades, and an enhanced transportation system.

The JGSDF logistics headquarters concept involves a nationwide resource control system with centralized stocks. This system would reduce the quantity of stocks regional armies must maintain to support their forces. The headquarters also could include a logistics control center focused on distribution-oriented support. The JGSDF logistics headquarters would manage the Ground Materiel Control Command, the

Central Transportation Management Command, and all five regional depots to make use of the management links already in place in these organizations. In addition to lowering manpower requirements at each regional army depot, this consolidation would reduce costs while improving efficiency.

Another concept under consideration is the establishment of logistics support brigades, which would replace each regional army's logistics support unit. Currently, the regional army commanders are responsible for their respective regional army depots, logistics support units, and medical units. If the JGSDF logistics headquarters managed the depots and the logistics support brigade took on the remaining support requirements, the regional army commanders could focus on tactical issues.

The third concept under consideration is an enhanced transportation system that uses advanced information technology to integrate transportation planning and facilitate coordination between transportation suppliers and users. A transportation management element would be established in the transportation unit of the logistics support brigade of each regional army. The transportation management element would include a headquarters section, a plans and operations section, and several terminal operations sections. The element would accept transportation requests, coordinate requirements, and monitor the receipt, sorting, and shipping of supplies. This concept would represent a major move forward for the JGSDF because it would integrate transportation links between the regional armies; improve coordination among the JGSDF, JMSDF, and JASDF; and expand opportunities for military and civil transportation agencies to work together.

A significant change under development is the shift of operational control of the JGSDF, JMSDF, and JASDF maneuver elements from the services to a Joint Staff Office. This change would allow the Ground, Maritime, and Air Staff Offices to focus on service issues. A JGSDF logistics headquarters would coordinate logistics support operations for JGSDF elements in the expanded joint environment of the Japan Self-Defense Force. The new Joint Staff Office is scheduled to be operational in JFY 2006.

Humanitarian and Peacekeeping Operations

Since the JGSDF is prohibited from participating in combat operations that are a part of allied or coalition military efforts, opportunities for JGSDF logistics elements to conduct actual sustainment operations are limited. However, there is a unique way to conduct logistics support operations outside of Japan without challenging restrictions imposed by the Constitution. With the enactment of the International Peace

In a field environment, repair parts are made in this type-73 truck-mounted mobile parts fabrication shelter.

Cooperation Law in 1992, Japan began providing support to international disaster relief, humanitarian aid, and United Nations (UN) peacekeeping operations. The JGSDF has dispatched engineer, logistics, and medical contingents in support of international relief and UN efforts around the world, including those in Cambodia, Mozambique, Zaire, and Honduras.

Japan currently is supporting two UN peacekeeping efforts. The JGSDF has had a transportation contingent dispatched to the Golan Heights, on the Israel-Syria border, in support of the UN Disengagement Observer Force (UNDOF) since 1996. This JGSDF contingent of approximately 43 personnel provides support, including the transport of items from seaports and airports in Israel, Syria, and Lebanon, to UNDOF camps throughout the Golan Heights. In 2002, the JGSDF dispatched an engineer contingent with four engineer companies and approximately 680 personnel and 300 vehicles as part of the UN Mission of Support in East Timor (UNMISET). This JGSDF contingent conducts general construction and road improvement projects and provides water purification and medical support.

On 26 July, the Japanese Parliament passed a Special Measures Bill for Iraq that permits the dispatch of Japan Self-Defense Force elements to assist with reconstruction efforts in Iraq. A contingent of up to 1,000 JGSDF personnel may be deployed to Iraq as early as November to provide logistics support.

Through its humanitarian assistance, disaster relief, and peacekeeping efforts, the JGSDF is developing a solid base of practical logistics experience. Although the logistics support structure of the JGSDF is not designed to provide support to deployed forces, JGSDF doctrine continues to evolve as the JGSDF refines logistics support for its dispatched elements.

Logistics Experience With Allies

The JGSDF benefits from the wealth of logistics experience its allies have amassed. Annual Ground

Staff Office-sponsored forums, such as the Bilateral Logistics Conference and the Multilateral Logistics Staff Talks, give participating nations an opportunity to discuss topics of mutual interest and allow visiting nations to learn more about Japan and the JGSDF.

The most recent Bilateral Logistics Conference focused on transformation efforts and included a visit to the 12th Brigade, JGSDF's only airmobile brigade. The 12th Brigade, formerly the 12th Division, has four infantry regiments, an artillery unit, a helicopter unit, a logistics support unit, and approximately 3,500 active-duty and 500 ready-reserve personnel. The brigade's comprehensive restructuring effort focused on retaining key combat elements while reducing its footprint and maintaining mobility.

Logistics officers from allied nations are invited to participate in the weeklong Multilateral Logistics Staff Talks. This year's talks included representatives from France, Germany, Japan, the United Kingdom, and the United States. Participants discussed methods for improving efficiency and collaboration for logistics systems, combat support and combat service support transformation, and logistics support for operations other than war.

As the JGSDF transforms, its logistics support doctrine also is transforming to ensure proactive support to the soldier. While logisticians strive to provide comprehensive support while reducing both costs and the logistics footprint, the JGSDF will continue to seek initiatives that will improve efficiency and minimize costs. Japan and the United States remain committed to maintaining stability throughout the Asia-Pacific region. As the ground forces of both nations transform, their logistics capabilities must adapt to ensure proactive support. The dynamic changes taking place clearly indicate that the Japan Ground Self-Defense Force is looking ahead to the future.   **ALOG**

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Casualty Estimation in Modern Warfare

by Major David R. Gibson

Operational planners must be able to identify workable courses of action, allocate an appropriate amount of combat resources, and tailor adequate logistics support packages for any scenario. Their challenge is to produce reasonably accurate forecasts in order to provide an appropriate amount of resources at the right place and time. Casualty estimation is critical to planning the logistics component because inaccurate casualty estimates can cause clogged lines of communication, making transportation, personnel replacements, and medical treatment unavailable when needed.

Casualty estimates were a primary consideration for Operation Desert Storm. As noted by the Army Surgeon General at the time, Lieutenant General Frank F. Ledford, Jr., in the January–February 1992 issue of *The Journal of the U.S. Army Medical Department*, "By the beginning of the ground war, the AMEDD [Army Medical Department] had more than 13,000 beds in 44 hospitals in theater." These estimates proved to be high because only 357 wounded in action and 145 killed in action were reported at the end of the war.

Logistics estimates are products of many assumptions. Although estimates will be continually refined, they must be within reasonable ranges in order to initiate the flow of soldiers and materiel needed to establish the appropriate support structure. Estimates are nothing more than forecasts. However, forecasts that are grossly off target, as were the casualty estimates for Operation Desert Storm, can do more than merely hamper efficiency; they can significantly degrade the probability of success by causing the misallocation of precious resources.

Over the last century, the nature of warfare has evolved substantially. Yet, casualty estimation continues to offer logistics challenges. This is caused, in part, by the inadequacy of the current casualty estimation techniques that are based on World War I casualty rates.

World War I Tactics

World War I was characterized by the extensive use of trench warfare, massive artillery bombardments, and battles of attrition. Parity of forces, firepower, tactics, and strategy often resulted in gridlock. Stalemates between forces led to experiments with new technologies, including machineguns, poison gas, and tanks, in attempts to break through defensive lines and create opportunities for offensive maneuver. Strategy and tactics were based on easily coordinated and controlled movements—advances, encirclements, or envelopments.

Tactics were tied to entrenchment and generally resulted in high casualties and minimal gains of terrain. In 1916, the French suffered 950,000 casualties, with 362,000 in the Battle of Verdun alone. In the Battle of the Somme, the British sustained 60,000 casualties before noon on the opening day and over 400,000 after 140 days of fighting. Neither battle resulted in one side achieving significant operational gains.

Breaking through the lines of defense was the challenge, but the solution was uncertain. This problem led the British to introduce the tank in 1916 as a means of rupturing the enemy's defense for exploitation by reserve forces. Despite the use of rolling artillery barrages and mechanized vehicles, warfare was reduced to a collision of forces, where victory was determined by the resolve of the force with the most personnel.

A Change in Tactics

During World War II, the German Army discovered the lethality of marrying deception with combined arms and deep battle engagement. By combining the *Luftwaffe* (Air Force) and armor with deceptive diplomacy, the Germans were able to take both Poland and France by complete surprise. Their approach was so effective that it was referred to as *Blitzkrieg*—German for "lightning war." Combined arms and deep battle engagement ushered in a new era of warfare and generated changes in technology, strategy, and tactics. Despite these significant changes, only minor adjustments were made to casualty estimation methods.

Operation Cobra—25 July 1944

In June 1944, the Allies had assembled the largest armada ever as part of a combined assault of the beaches of France. The intent was to establish a foothold on the continent that would support an Allied force follow-on attack meant to open a second front and defeat the Germans. The famous assault, known as D-Day, was successful, but by the end of June, U.S. forces were bogged down fighting Germans in the hedgerows. The Germans were holding the First U.S.

Army along a defensive line running generally west to east, just northeast of Marigny, France.

On 12 July, General Omar Bradley presented to his staff the plan for Operation Cobra—a bold attempt by First Army to attack with the VIII, VII, XIX, and V Corps abreast in order from west to east. Field Order Six, issued 20 July, stated, "VII Corps will penetrate the enemy's defenses between Marigny and St. Gilles; seize and hold the line; [from] Countances [to] Marigny so as to cut off the enemy forces facing the VIII Corps; assist the VIII Corps in the destruction of these forces; and block . . . many enemy reinforcements from the south or east from interfering with this operation."

VII Corps would use the 9th Infantry Division to attack in zone with the 4th and 30th Infantry Divisions on its left. The 9th, 4th, and 30th Infantry Divisions were to seize their objectives, protect the Marigny-Gilles gap from a southern attack, and protect the left flank of the corps' penetration. The 1st Infantry Division would move through the gap cleared by the 9th Infantry Division; the 3d Armor Division would move through the gap cleared by the 4th Infantry Division; and the 2d Armor Division would move through the gap cleared by the 30th Infantry Division. All divisions would seize and secure follow-on objectives to prevent the enemy's reinforcements from moving north.

Beginning 20 July, troops were being positioned in assembly areas in preparation for Operation Cobra. The operation, planned for 24 July, was delayed until the 25th because of poor weather conditions. Between 20 and 25 July, VII Corps encountered limited contact as the enemy began to withdraw. Referring to the German enemy, the VII Corps G–2 stated in his intelligence estimate on 17 July, "His only act of an offensive nature consisted of a number of small scale tank-infantry thrusts at the first Army lines, most of which were directed at the area northwest of St. Lo and fell in the VII Corps sector." VII Corps repelled all of these attacks.

VII Corps expected success within 5 to 7 days. The attack would be supported by heavy aerial bombardment and ground artillery. The G–2 estimate dated 17 July stated, "The enemy continues through necessity his policy of piecemeal commitment of reserves; consequently, a full-scale or coordinated counterattack in connection with Operation 'Cobra' appears highly improbable." The G–2 further noted that the German LXXXIV Corps did not appear to have reserves; an unidentified division at about 70-percent strength could reach the area within 2 days; the 11th Panzer Division and an unidentified division could not arrive before 20 July; and at that time, he did not expect more than a battalion-sized counterattack rein-

forced by more than 35 to 40 tanks. The G–2 concluded that the enemy most likely would withdraw and continue hedgerow defensive tactics while awaiting reinforcements.

Conducting the Estimates

To determine the effectiveness of three common methods of estimating casualties, I used each to estimate the casualties of VII Corps during Operation Cobra with only the intelligence and guidance available from the original field order. A comparison of the results of these estimates to the actual casualties reveals the shortcomings of current methods.

I used the Benchmark Rate Structure (BRS) method, the method prescribed in Field Manual (FM) 101–10–1/2, Staff Officer's Field Manual—Organizational, Technical, and Logistical Data Planning Factors (Volume 2), and an Excel-based model called the Medical Course of Action Tool (M–COAT). This comparison demonstrated that the BRS casualty estimation method produced the most accurate results. [Editor's note: FM 101–10–1/2 was rescinded in 1997. However, many planners still use the casualty estimation method prescribed in the FM.]

The procedure for using the BRS estimate process for VII Corps is as follows—

• ***Define the planning timeline.*** Based on the oral order issued 16 July and Field Order Six issued 20 July, the timeline starts with VII Corps units moving to assembly areas on 20 July, while enemy forces began withdrawal. Planners anticipated that the operation would take from 5 to 7 days. Therefore, the timeline consists of two periods. The first covers the positioning and preparation of forces from 20 to 24 July. The second covers 5 to 7 days for the actual attack planned for 24 July.

• ***Array the forces into appropriate "population at risk" groupings.*** VII Corps strength was 88,952 in the maneuver force and 22,000 in the echelons-above-division (EAD) force.

• ***Identify and portray the basic intended scheme of maneuver.*** VII Corps would act as the main effort attack for the First Army, attacking with the 9th, 4th, and 30th Infantry Divisions abreast. These divisions would be followed by the 1st Infantry Division and the 3d and 2d Armor Divisions.

• ***Characterize the maneuver forces' major operational episodes along the timeline in terms of the three operational forms (continuous, disrupted, or disintegrated front) or operational pause.*** For the first 5 days (20 through 24 July), planners foresaw an operational pause—a period when casualties would be taken at low levels because of sporadic engagements as the enemy withdrew. They expected the second period to last about a week, but they did anticipate success.

Therefore, they anticipated a disrupted front for the second period.

• ***Determine a rate profile appropriate for the maneuver forces.*** Using Chairman of the Joint Chiefs of Staff Guide 3161, Battle Casualty Rate Patterns for Conventional Ground Forces, the casualty rate for the first period was 2 casualties per 1,000 soldiers per day. A rate of 8 per 1,000 per day was appropriate for the second period, which was the corps' main attack sector.

• ***Determine a casualty rate profile for corps support (EAD) forces:*** For the first period, I used a rate of .5 per 1,000 per day for EAD forces. For the second period, I used a rate of 1 casualty per 1,000 per day.

• ***Determine a casualty rate profile for the theater support (echelons-above-corps [EAC]) force.*** Since I conducted this analysis on VII Corps forces only, EAC forces were not computed.

Using the above information, the BRS casualty estimate came out as 4,612.

Using FM 101–10–1/2 to calculate the casualty estimate, the estimator multiplies the strength each day by a factor defined in the FM. The estimated number of casualties using this method was 19,610.

With the M–COAT spreadsheet, Excel calculates daily casualties. Multiplying the daily totals for troops in the division and corps area and by the total number of days produces the casualty estimate. In this case, the estimate was: $(897 \times 10) + (177 \times 10) = 10,740$.

Comparing the Results

The VII Corps after-action report dated 9 August 1944 revealed that the actual number of VII Corps casualties recorded from 20 through 29 July 1944 was 5,031. Thus, the BRS estimate of 4,612 is the most accurate, with a forecast that is within 8 percent of the casualties actually incurred. The M–COAT estimate is second, at 113 percent of the actual number. The FM 101–10–1/2 estimate is the least accurate at 289 percent of the actual number of casualties sustained.

The relative accuracy of the BRS over the other two methods probably can be attributed to its approach. The BRS requires planners to define the form of the operation, array the units' populations at risk, and identify appropriate rates across the operations timeline consistent with the envisioned operational form. Acknowledging operational pulses and pauses allows planners to select different rates for these different periods of activity.

In his book, *Ground Forces Battle Casualty Rate Patterns*, George W.S. Kuhn argues that "the Army's FM 101–10–1/2, table 4–18 rests in the operational practices of World War I . . . the rates found in today's version of the table again reflect precisely the rate proportions originally defined in World War I experi-

ence." Kuhn reveals that the rates in the manual were arbitrarily reduced by 25 percent in 1944 and again by 50 percent in 1949. Although FM 101–10–1/2 is widely used for casualty estimation, the last version, which was published in 1987, offers the same rate structure found in the 1944 manual, with rates and factors that are 63 percent lower than the World War I casualty rates. In fact, FM 101–10–1/2 states that casualty estimation is "based on historical data generated through experience (primarily from World War I and the Korean Conflict)."

The M–COAT model is based primarily on an attrition algorithm developed by Colonel Trevor N. Dupuy, USA (Ret.), with a variety of additional modifications to the calculation. The M–COAT model is not approved for use by the Army; however, its simplicity has made it the preferred tool of many planners. Neither the FM nor M–COAT addresses changes in operational forms as the BRS system does with its pulses and pauses.

Because of the continually changing nature of warfare, casualty estimation remains one of the most difficult forecasts to develop. The increased lethality of weapons and the advantages gained through superior intelligence collection may result in even more clearly defined pulses and pauses. An analysis of historical events shows that past conflicts have produced similar patterns of events that are reasonably represented by the rates used in the BRS. FM 101–10–1/2 and the Excel-based M–COAT model offer numerous input assumptions; however, they do little to address changes in the method of operations. When similar assumptions are applied to a given historical example, the three different methods produce three significantly different results. The primary deficiency of FM 101–10–1/2 is its dependence on World War I data. However, neither the FM nor M–COAT addresses pulses or pauses of activity in operations. Although the BRS method is probably the least used, its accuracy on a retrospective analysis demonstrates that it is probably the best tool to apply for future conflict analysis. **ALOG**

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Blending Used Oil and Vehicle Fuel

BY CHIEF WARRANT OFFICER (W–4) ARTHUR KEGERREIS, PAARNG

Cost-conscious maintenance managers are constantly seeking ways to do business with less money, fewer people, and minimal changes to the workload or workspace. Oil and fuel blending is one process that meets all of these criteria and is mechanic friendly.

Fuel blending may be performed when directed by the Army Oil Analysis Program laboratory or during any unscheduled maintenance when an oil change is required. Waste motor oil from a vehicle's crankcase is blended with diesel fuel or JP8 fuel from the vehicle's fuel tank. After passing through a filter, the oil and fuel mixture is put into the vehicle's fuel tank to be burned as fuel. Fuel blending should not be performed if the oil has any sign of antifreeze contamination.

The oil and fuel blending system consists of a drain pan for collecting the waste oil and a pump and blender with hoses. The blending device (see photo below) draws oil from the drain pan and fuel from the vehicle fuel tank, blends and filters the mixture, and returns the blend to the vehicle fuel tank. The filter removes virtually all contaminants that could potentially damage engine components except antifreeze.

The advantages of using the system are many—

• Any traditional diesel engine, such as a vehicle or generator, can use the system.

• The blending process takes only an average of 15 minutes.

• The cost of one gallon of diesel fuel is saved for each gallon of waste oil blended.

• The cost and labor involved in collecting, storing, and transporting waste oil is nearly eliminated.

• The blend is consumed with no adverse effects on the engine or any unusual emissions into the atmosphere.

• Reusing the oil prevents most oil spills and the resulting cleanup costs.

• The process is an environmentally friendly method of disposing of used oil.

For 33 vehicles using the oil blending process over a 3-month period during Operation Joint Forge in 2002—

• The blending operation required 12.25 hours as opposed to 49.5 hours for a traditional oil and filter change, saving 37.25 hours, or $745.

• Mechanics blended 70.5 gallons of oil, so 70.5 gallons of fuel did not have to be purchased.

• No storage, record keeping, or $50 disposal fee were required for 70.5 gallons of waste oil.
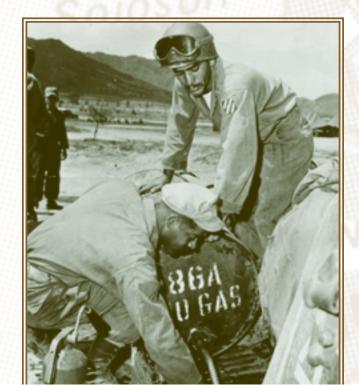
Oil blending has many advantages and few disadvantages. Probably the most significant reasons for using this process are that it eliminates fuel waste and helps keep the environment clean. The system is approved by the Tank-automotive and Armaments Command and should be required in all maintenance activities. **ALOG**

This oil-blending device is used to collect the used oil from the vehicle, draw fuel from the vehicle's fuel tank and blend the two. Once the vehicle's fuel and used oil are blended, the mixture is returned to the fuel tank to run the vehicle, saving the need to dispose of the oil.
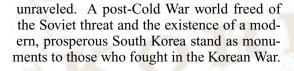
CHIEF WARRANT OFFICER (W–4) ARTHUR KEGERREIS IS A MEMBER OF COMPANY B, 728TH MAIN SUPPORT BATTALION, 28TH INFANTRY DIVISION, PENNSYLVANIA ARMY NATIONAL GUARD. DURING A 12-MONTH DEPLOYMENT TO BOSNIA-HERZEGOVINA, HE SERVED AS THE TASK FORCE EAGLE MAINTENANCE OFFICER. AS A CIVILIAN, HE IS THE AUTOMOTIVE WORKER SUPERVISOR AT ORGANIZATIONAL MAINTENANCE SHOP #15 AT FORT INDIANTOWN GAP, PENNSYLVANIA. HE IS A GRADUATE OF THE WARRANT OFFICER SENIOR COURSE.

Logistics and the 'Forgotten War'

Between World War II and the Vietnam War, there was the Korean War. It was a particularly savage war that succeeded in repelling the North Korean invasion that was its cause and in preserving the infant Republic of Korea—South Korea. However, it did not conclude with a lasting peace but with only an agreement to stop the fighting. Fifty years later, we are still dealing with the geopolitics of the Korean Peninsula that started the war.

Perhaps because it had an ending short of the enemy's surrender and because it is overshadowed in American memory by the longer wars that preceded and followed it, Americans sometimes characterize the Korean War as the "Forgotten War." But to overlook the Korean War is not only unfair to those who fought in it, it also obscures the war's real significance. Perhaps what was achieved in the Korean War can best be appreciated by adopting a long-term perspective: We can see Korea as a hotspot in the half-century-long Cold War between the United States and the Soviet Union—one of the conflicts, along with Vietnam and Afghanistan, in which one of the protagonists engaged in actual warfare, though with surrogates of the other. By taking this view, we can see the war as a significant achievement in the long process of countering and containing Soviet power until the Soviet state finally unraveled. A post-Cold War world freed of the Soviet threat and the existence of a modern, prosperous South Korea stand as monuments to those who fought in the Korean War.

Three Years of Ebb and Flow

At the end of World War II, the Korean Peninsula was partitioned into two zones of occupation that soon became rival states: a Communist North Korea under Kim Il Sung, sponsored by the Soviet Union, and a Western-aligned South Korea under Syngman Rhee. The war began when North Korea, with Soviet approval, invaded South Korea on 25 June 1950. The ensuing conflict lasted 3 years and 1 month and can be divided into four phases.

June to September 1950: The North Korean offensive. The surprising North Korean attack quickly captured Seoul, the South Korean capital, and most of the rest of South Korea before U.S. and South Korean forces could halt the onslaught along a 140-mile-long line in southeast South Korea radiating around the port city of Pusan—the so-called Pusan perimeter. The North Korean invasion prompted an immediate United Nations (UN) call for member states to contribute military forces to repel the aggression. Twenty other nations eventually sent forces to fight alongside the United States and South Korea.

September to November 1950: The UN counteroffensive. Rather than attempting to regain the offensive from Pusan, the UN commander, U.S. General Douglas MacArthur, decided to land forces at Inchon, on the west coast of the peninsula just west of Seoul. (MacArthur was the commander in chief of the U.S. Far East Command [FEC] and had become commander in chief of the United Nations Command on 10 July 1950.) Through this daring attack on 15 September, MacArthur was able to surprise and outflank the bulk of the North Korean forces. The Inchon landing, combined with a breakout of U.S. forces from the Pusan perimeter, resulted in the destruction of the North Korean Army and allowed UN forces to

Soldiers of the 3d Infantry Division refuel a tank with a 55-gallon drum in 1952.

reoccupy South Korea, drive over the border into North Korea, and barrel through North Korea to the Yalu River, which separates North Korea from China.

November 1950 to January 1951: The Chinese intervention. Faced with the defeat of North Korea and the prospect of a united Korea allied with the United States on its doorstep, the Communist government of China—in power for just a year—sent a massive force south into Korea to turn back the UN advance. The result was the longest retreat in U.S. history. The Communist allies recaptured Seoul and advanced well into South Korea.

January 1951 to July 1953: The UN counteroffensive, stalemate, and negotiations. The UN forces halted the Communist advance and launched a counterattack on 25 January 1951. Seoul was retaken on 14 March; by June, the lines between the adversaries had stabilized near the 38th parallel—roughly the prewar border between the two Koreas. Negotiations to end the war began in July, although fighting would continue for 2 more years. The armistice ending the fighting was signed at Panmunjom on 27 July 1953.

Unprepared for War

The U.S. Army that responded to the North Korean invasion was not prepared for a major conflict. The drawdown of military forces after World War II, subsequent reductions in military spending, and the postwar shift of industrial production toward civilian needs combined to produce an Army that did not have sufficient materiel or logistics personnel for the crisis.

If the Army as a whole was unprepared for war, the FEC was particularly understrength and undersupplied. This was largely the result of the U.S. strategic focus on Europe and the need to counter Soviet expansion there. Korea, in particular, was not a strategic priority for U.S. planners. According to James F. Schnabel in *Policy Direction: The First Year* (in the *United States Army in the Korean War* series)—

> The Far East Command had received no new vehicles, tanks, or other equipment since World War II. . . . Levels of supply on hand in the FEC by mid-1950 amounted to a 60-day depot level plus 30-day levels in station [installation] stocks. But supply resources were out of balance both in quantity and quality. . . . Total ammunition resources [of the FEC] amounted to only 45 days' supply in the depots and a basic load of training ammunition in [the] hands of units.

The shortage of logistics personnel had been great enough that Eighth Army, the largest Army component of the FEC, which was based in occupied Japan, had hired 150,000 Japanese nationals to perform support functions at stations, depots, and ports.

The lack of U.S. military readiness received con-

Steak is served to the 43d Transportation Truck Company in Uijongbu in 1951.

crete expression in the trials of the first infantry troops deployed in Korea—the battalion (+) of the 24th Infantry Division known as Task Force Smith—which fought bravely but was forced back because it had neither the men nor the weapons to match the North Korean attackers. The rest of the division fared no better as it deployed and went immediately into battle.

A Difficult Theater of Operations

Besides the shortage of trained logistics personnel, several factors combined to make Korea a difficult place for supporting a war. These factors included—

• The rugged terrain of the Korean Peninsula. Mountain ranges running north to south channeled transportation into valleys and the west coast lowlands.

• The lack of transportation infrastructure. Korea had a limited rail network and very poor roads. Delivering materiel to ports was the easy part of Korean supply; moving materiel on to the front lines, and in particular beyond railheads, was a challenge.

• The fluid nature of combat operations. This was especially true during the war's first year, when the North Koreans, the UN, the Chinese, and then the UN again took turns surging up and down the peninsula—capturing, losing, and recapturing the same terrain.

These factors combined to determine the shape of logistics support and, in many cases, required Army logisticians to improvise.

Supporting a Distant War

The immediate U.S. challenge following the invasion was to deploy men and materiel quickly enough to stop the North Korean tide and gain time for a buildup of combat power on the peninsula. In this, the Army was successful: Within 3 months, it deployed over 100,000 personnel and 2 million tons of materiel to Korea. Materiel stored in the theater after World War II proved to be a major source of supply in the Korean War's early months; the ordnance rebuild program in Japan was vital to using this materiel.

During the war, approximately 31.5 million tons of materiel were shipped to Korea from the United States—more than two times the tonnage shipped to

Europe during World War II. The war pioneered the use of container express (CONEX) service, which began with the shipment of containers from Japan to Korea in June 1951. By November 1952, CONEX service was being tested from the United States; the average delivery time of containers from the depot at Columbus, Ohio, through the port of San Francisco to the depot at Yokohama, Japan, was 27 days.

On 24 August 1950, MacArthur established a new command to relieve Eighth Army of its responsibilities in Japan. The Japan Logistical Command, headquartered at Yokohama, assumed the function of moving materiel from Japan to Korea. The command received requisitions from Eighth Army in Korea, sent them to agencies in the United States, received all shipments arriving in Japan, and forwarded supplies and equipment to Korea.

Eighth Army's logistics mission included support of all UN forces in Korea and assistance to Korean civilians. The Army created the 2d Logistical Command to support the Eighth Army. (The 3d Logistical Command supported the X Corps, which executed the Inchon landing.) The 2d Logistical Command hired more than 100,000 Korean nationals to make up for its personnel shortages.

Responding to Challenges

The greatest logistics concern of the Korean War was the shortage of ammunition. This was partly the result of the high rates of fire in Korea. But the greater problem was the lack of any significant munitions production in the United States when the war began. It was not until the end of 1952 that U.S. production had been expanded sufficiently to support the demands of the Far East theater; munitions output was 30 times greater in the last 6 months of 1952 than it had been in the last 6 months of 1950.

About 65 percent of the total tonnage of materiel shipped to Korea was petroleum, oils, and lubricants (POL). The Army was assigned the mission of supplying POL to all UN forces—ground, air, and sea. The biggest problem in POL supply was the absence of petroleum pipelines in Korea. Shortages of tanker trucks meant that most fuel was distributed by railroad or airlift in 55-gallon drums and 5-gallon cans, which became ubiquitous in the theater. Airlift played a prominent role in fuel distribution when UN forces were dispersed across North Korea.

Because of mountainous terrain, inadequate transportation, and changing tactical conditions, a doctrinal supply distribution system could not always be established. Shifts in combat sometimes required Quartermaster units to ship supplies directly from base depots to forward supply points rather than to intermediate depots. Supply points were located so they could be ready for quick repositioning. The mountainous terrain and the poor transportation infrastructure often meant long turnaround times for supply distribution missions.

One surprising development in view of these factors was the widespread distribution of fresh foods as part of the rations. This was made possible by the use of refrigerator railcars, refrigerator vans, refrigerator barges for offshore storage and coastal transport, and "walk-in" refrigerator boxes located at supply points and major forward elements. Refrigeration technology made it possible to serve such items as fried eggs and bacon, fried chicken, baked potatoes, fresh fruit and vegetables, and ice cream in the field.

Improved medical care helped to reduce mortality among the wounded compared to World War II. Two important innovations contributing to this success were the use of the 60-patient mobile army surgical hospital (MASH), which provided field surgical teams for those who needed surgery before they were moved to the rear, and aeromedical evacuation by helicopter.

At the start of the war, the United States followed past practices by interring the deceased in temporary field cemeteries. But the withdrawal of U.S. forces south of the 38th parallel after the Chinese intervention led to an innovation: the evacuation of remains to the United States while combat was underway. The new policy required the establishment of a central facility at Kokura, Japan, at the end of December 1950 to receive, identify, prepare, and ship home remains.

The Chinese intervention of November 1950 changed the nature of the Korean War. What looked at that time to be a short war ending in triumph turned into a much longer struggle ending in stalemate. This change in fortunes, coupled with the lack of U.S. preparedness that became obvious in the war's early days, led to some major changes in strategic thinking.

The Korean War, and the larger Cold War surrounding it, convinced policymakers that the United States was entering an extended period of international tension that would not allow for sliding back into unpreparedness after a war. The Nation would need to maintain a permanent domestic industrial base that could support the military, but this base would have to be managed to avoid disrupting the civilian economy.

Preparedness probably is the greatest logistics lesson of the Korean War. As General Gordon R. Sullivan observed during his tenure as Army Chief of Staff, the Nation and the Army need to be prepared: there can be "No more Task Force Smiths." **ALOG**

—Story by Robert D. Paulus

Civilian Teams and Army Hierarchy

BY DR. CRAIG C. KURIGER

The private sector is turning to empowered teams of workers to accomplish organizational goals. Can that approach work in the top-down, command Army?

When most Americans think of military leadership, they probably envision scenes like these: an officer shouts "Ten-hut!" as 200 soldiers snap to attention; a lieutenant replies, "Yes, sir," salutes, and leaves to carry out a colonel's order. Yet, while these images may be accurate on the parade ground, are they always true? What happens, for example, when military personnel are called on to lead civilians? Are the results as crisp and orderly as when the colonel commands the lieutenant?

President Harry S. Truman commented on the relationship between civilian workers and military commanders when discussing his successor, General Dwight D. Eisenhower, who had been the commander of the European theater during World War II. As a career Army officer, Eisenhower was accustomed to giving orders and having them obeyed. But now, following his election as President, Eisenhower would command a largely civilian bureaucracy. That prospect led Truman to predict, "He'll sit behind that big desk and say, 'Do this', and 'do that.' And do you know what will happen? Nothing."

This anecdote illustrates that, for the military leader, managing a civilian workforce is different from leading military subordinates. Within the United States, many military organizations are called on to do just what Eisenhower was about to do—manage civilians. For example, the Army Materiel Command and its subordinate commands are staffed predominantly by civilians, with civilians and soldiers sharing the management role. A major part of what these organizations do involves noncombat activities, such as procurement, production, storage, and maintenance of materiel; quality assurance; research and development; engineering; and installation management. These functions are similar to those performed by the private sector in producing and distributing consumer goods and services.

To accomplish its goals and serve its customers, the private sector increasingly organizes its personnel into teams that are empowered to act freely, within certain boundaries, to perform a task. However, the use of empowered teams inherently conflicts with the culture of a rigid hierarchy like the Army. The military practice of issuing orders to subordinates and expecting them to be executed without question is very different from the practice of giving a group of subordinates authority and responsibility for accomplishing a goal and then letting them do so without interference.

For many years, the Army has used teams such as fire support teams and aircraft maintenance teams. Official Army policy seems, in the main, to allow or even encourage teamwork and empowerment. However, the Army appears to face a potential conflict between its tradition of hierarchical management and its policies that encourage delegation of authority to work teams. I recently conducted a study to determine if such a conflict does in fact exist. I wanted to see if Army policy was having the desired effect of fostering teaming in Army management, or if the traditional hierarchal management culture still prevailed.

Army Policy on Teams

Research has shown that a bureaucratic-type hierarchy that organizes skills and expertise in functionally specific units compartmentalizes people and restricts the use of their abilities and talents. Teams, on the other hand, allow people to expand their talents and abilities. The interaction of team members creates a synergy that lets the team accomplish more work than the same number of workers could have accomplished in a different organizational structure.

Army Regulation (AR) 5–1, Total Army Quality Management, defines employee empowerment as one of the four principles of Total Army Quality. It states—

Empowered employees have the ability to make decisions and take actions that improve processes that provide value to the customer. Leaders empower employees and teams by giving them authority and resources while holding them accountable to produce results. Empowerment shares control, responsibility, and ownership of organizational processes.

Meanwhile, AR 600–100, Army Leadership, defines leadership as "the process of influencing others to accomplish the mission by providing purpose, direction, and motivation." The same regulation also defines command "as special powers of responsibility and authority" associated with the chain of command (in other words, the hierarchical structure).

Here lies the dichotomy: leadership concerns itself with "influencing" others (meaning subordinates) to do their jobs, but "command" is based on getting people to do the job by virtue of the leader's power and authority.

Army guidance is not totally clear on how employee empowerment and command fit together. For example, Field Manual 22–100, Army Leadership, says that leaders of organizations should communicate through the chain of command. Then, in the next paragraph, it states that the same organizational leaders should empower their subordinates. Although these two examples of Army guidance may not be in conflict when read *literally*, they may be diametrically opposed *philosophically*.

While a review of Army policy and guidance indicates that Army policy is somewhat ambiguous, it definitely leans toward the use of empowered teams in situations that are not affected by the demands of combat. Other research in the use of teams in the military indicates that teams have not reached the expected levels of empowerment and decisionmaking and that, as also occurs in the private sector, military management tends to resist fully empowering teams.

Studying Teams at an Army Command

My study was conducted at a major subordinate command of the Army Materiel Command located in the Midwest. This command has over 1,000 civilian and military personnel who manage the acquisition, fielding, storage, and maintenance of various types of weapons, defensive chemical systems, and related support systems.

My research used the case study format. I interviewed 18 employees, divided as follows: a team member and a team leader from a team in each of 5 departments (10 in all); 2 union representatives; and 6 managers at the group, director, and higher levels. (A group manager oversaw two or more teams, and a director oversaw two or more groups.)

Besides the interviews, I observed four team meetings and one daylong training session, which allowed me to evaluate the dynamics of various teams and the factors affecting empowerment. I also observed meetings between management and the subordinate team leaders, which helped reveal the degree of empowerment enjoyed by the teams. I was given generally free access to work areas throughout the organization to observe teams at work.

Finally, I examined documentation on the establishment and operation of the teams, including team charters or goals and objectives, organizational histories, training records, and reports. Individual employees willingly provided copies of performance plans and appraisals.

Study Results

The study found that, with some limitations, teams were empowered to make decisions related to their assigned goals and objectives. Those decisions were normally made through consensus seeking. At the same time, the study found that team members were empowered to perform their individual jobs as they considered proper. Team members did recognize that each person brought specific expertise to the team that may have given that person more weight on particular issues. Team members shared the goal of doing everything they could to satisfy the customer—the soldier in the field.

The organization's managers believed that the performance of teams (including their decisionmaking) could be improved by giving them more power. Team leaders and members did not specifically ask for more empowerment, but in general they believed that more resources (people and funding) and tools (training and computer tools) would improve the performance of their teams.

Although there was some evidence that team leaders made some decisions unilaterally, this apparently did not happen often enough for it to be raised as a concern by team members. On the other hand, there was no evidence of either superficial cohesiveness or too much cohesiveness (or "group think") in the decisionmaking process. The interviews and observations showed open discussion as the teams considered everyone's opinions. In the same way, there was no evidence of coercion in the teams' decisionmaking.

There was no conclusive finding that management at the site routinely overturned teams' decisions. In those few cases where local management changed a decision, the teams usually were satisfied with the rationale (such as lack of funding). Decisions more often were changed by higher headquarters elements at another location.

All employees in the organization had recently completed team-related training. While management was

positive about the training, team members were more skeptical about its benefits. They took a "wait-and-see" attitude about whether or not management would change. Team personnel (both members and leaders) wanted management to work more on personnel issues (such as allocation of skills, motivation of poor performers, and providing training) and allow the teams to manage their assigned systems. Team members also believed that the teams would benefit from improvements in interpersonal relations.

Although the teams reported some obstacles, there was no particular systemic roadblock related solely to being part of a military organization. Being in a military organization affected the operation of teams in one area: the biennial change of the commanding general. This change in leadership was noted more keenly by management than at the lower organizational levels. Managers also noted the tendency of some general officers to micromanage programs or systems of personal interest to them. When this reported micromanagement occurred, resources were diverted from doing the actual work of the teams to preparing special reports or briefings. Micromanagement was seen as reflecting a lack of trust in the teams' abilities and resulted in a reduction in empowerment.

One problem that significantly affected the performance of the teams was the direction of a particular commanding general to remove the acquisition function from the teams and establish it in a separate organization. As a result, acquisition-related decisions that affected team performance fell outside of the teams' purview, even though the teams were responsible for developing acquisition strategies needed to fulfill soldier requirements. Study participants, both on teams and in the acquisition organization, believed that the teams would have been more effective if the acquisition function was returned to the teams. The existence of this problem was corroborated through observation of a meeting in which the failure of acquisition personnel to adequately support the goals of a team resulted in program delays.

Significance

Employees should hold management responsible for ensuring the type of environment that is conducive to empowering teams. Once they have provided that environment, managers should hold teams responsible for high performance.

While I was formulating the research questions for this study, I expected to find numerous or significant restrictions placed on the empowerment of teams by the military nature of the organization. I did not find this to be the case. I did find restrictions on empowerment in this study, but (except for those resulting from the change of commanding generals) they could

not be attributed to the military organizational environment. Rather, they could be attributed to the personalities and practices of specific managers. Those problems can be addressed through training and a firm commitment from the commanding general on down to make teaming work.

Only the biennial change in commanding generals and the reported propensity of some general officers to micromanage areas of interest to them were related to the military environment. Those are military problems only in that the general officers involved are military personnel. These two problems probably have parallels in the nonmilitary sector as well; after all, corporations are subject to changes in top levels of management, and there are undoubtedly civilian managers who micromanage.

On the whole, the level of success of the team-based organization at this command was the result of two positive conditions. First, the personnel knew their jobs and took their responsibilities to the soldier very seriously. Second, most managers were committed to empowering the teams and allowing the teams to do their jobs with little or no interference.

The restrictions that existed on the teams were caused primarily by the management actions of higher headquarters outside the command. Although local management attempted to "buffer" the teams from those restrictions, this could not always be done. Examples of changed decisions and removal from the teams of functions critical to team performance illustrate the actions of higher headquarters that adversely impacted team performance.

For teams in this type of military organizational environment to have the opportunity to excel, the higher headquarters elements to which the team-based organization reports also must be supportive, if not actually committed to the empowerment of teams. This case study demonstrates, however, that a workforce and management that are committed to empowered teams will pursue the concept up to the limitations that their environment (in this case, higher headquarters) places on them.

My major conclusion from this study is that, with supportive management, empowered teams can flourish in a military organizational environment. The Army can have the same success with teams that the private sector is experiencing.   **ALOG**

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The Logistics of Invasion

BY MAJOR FREDERICK V. GODFREY

Although not as popular or as widely studied as tactics, logistics has been the key to every major conflict since the dawn of modern warfare. World War II provided the backdrop for the biggest logistics operation ever attempted. The D-Day landing and force buildup alone involved millions of tons of supplies, thousands of ships, and hundreds of thousands of personnel. To carry out this massive logistics operation, planners used supply point and throughput resupply operations, which involve stockpiling supplies at depots in the rear, transporting them to forward depots, and moving them to the units.

The logistics buildup in Kuwait before the invasion of Iraq this spring was reminiscent of the logistics techniques used by First U.S. Army in World War II and repeated in the Korean War and the Gulf War of 1991. This article will look at the First Army's logistics buildup and sustainment operation from D-Day through its race across France into Germany and at current and future battlefield logistics. It also will examine the validity of moving from a supply-based logistics operation to the real-time logistics operation proposed in the Army Transformation.

Gearing Up for War

Preparations for the World War II invasion of France began 2 years before the actual operation. From January 1942 to June 1944, the United States shipped over 17 million tons of cargo to the United Kingdom. Included in the shipments was everything from general supplies and equipment to 800,000 pints of blood plasma, 125 million maps, prefabricated harbors (known as Mulberries), a replacement rail network, cigarettes, and toothbrushes.

The invasion operation divided the Allied forces into five task forces—three British and two American. The invasion forces landed on 6 June 1944 at five beaches in Normandy: Omaha, Utah, Gold, Juno, and Sword. At Omaha and Utah, the two American beaches, only 6,614 of the planned 24,850 tons of cargo were discharged in the first 3 days, which is indicative of the difficulties the Americans experienced in beach resupply operations.

The 12 quartermaster units that arrived with the assault forces provided everything from general supplies to transportation to graves registration. Although the Americans took several days to link up with the British forces, it was quite apparent by 7 June that the invasion was a success. Once the landing forces secured the beaches of Normandy, they had to organize to receive the supplies, equipment, and troops needed to sustain the invasion forces.

Port Discharge Problems

Shipments of supplies to the United Kingdom for the Normandy invasion not only had to compete with other combat operations in the European theater but also were restricted by the amount of supplies British ports could handle. By December 1943, steady shipments of supplies were flowing into the United Kingdom. By July 1944, more than two million tons had been shipped to the United Kingdom, which taxed the capability of the port facilities to hold and process the supplies. Supplies and equipment bound for France could not be discharged quickly enough to accommodate the new supplies, so a logjam developed.

Docking facilities were critical to the quick discharge of supplies and equipment in France. Mulberries were used to receive the tons of supplies and equipment needed to keep the invasion force moving forward. When the quantity of supplies coming in exceeded the number of Mulberries available, the remaining supplies were offloaded using logistics over-the-shore operations.

> *Good logistics alone can't win a war. Bad logistics alone can lose it.*
> —General Brehon B. Somervell
> Commanding General
> Army Service Forces, 1942

As the supply operation matured, 56,200 tons of supplies, 20,000 vehicles, and 180,000 troops were discharged each day at Omaha and Utah beaches. That was slightly less than half of the supplies, nearly two-thirds of the vehicles, and all of the troops that had been projected for offload each day. Performance on the American beaches improved rapidly as a more favorable tactical situation developed and, by 11 June 1944, all of the area up to the Aure River was under V Corps control. Until the securing of fixed port facilities at Cherbourg, Le Havre, Rouen, and Antwerp, Belgium, resupply and staging operations consisted entirely of Mulberries and logistics over-the-shore operations.

Soldiers load Redball Express trucks with rations bound for front-line troops.

Transformation of the Army to a capabilities-based force that can respond immediately to any global threat cannot occur without first transforming the logistics systems that have been used since World War II.

By the end of June, over 289,827 tons of supplies had been offloaded onto the Normandy beaches. However, shortages still occurred because supplies could not be discharged from British ports quickly enough and ships could not be turned around fast enough to keep up with the requirements of the landing forces. Therefore, by 15 June, supplies were being shipped directly to Normandy from the United States. At Normandy, supplies were stockpiled on the docks and beaches and then moved to forward units by truck.

The longer it took U.S. forces to secure the port of Cherbourg, the more supplies, equipment, and troops piled up on the beaches waiting to be trucked forward. In early August, the port at Cherbourg was cleared and opened so large quantities of supplies and equipment (more than 20,000 tons a day) could be loaded and moved forward by truck and rail. General William Whipple, Jr., USA (Ret.), former Chief of the Logistics Branch, G–4, Supreme Headquarters Allied Expeditionary Force, wrote in a 16 May 1967 letter to Brigadier General Eugene A. Salet, Commandant of the Army War College—

> Up to September, U.S. forces were supported largely across the beaches, but the U.S. beaches were known to be substantially unusable after 1 October on account of the weather. U.S. had the port of Cherbourg, which could handle about 20,000 tons a day; but this was inadequate, and was a long way from the front. Ports of Le Havre, Rouen, etc. . . . were so damaged as to be largely unusable, and such channel ports as were available had to be reserved with first priority for British use.

Port discharge problems led the way for the second major logistics problem in the logistics of invasion—moving supplies from the port to the front-line troops.

Logistics on the Move

Once U.S. and British forces broke out of the hedgerow country and began to race across open terrain, supply lines lengthened and resupply became more difficult. Allied commanders were frustrated because logistics transportation constraints prevented them from taking advantage of a favorable tactical situation. In August and September of 1944, supply forces set up a ground and air logistics express system to move food, fuel, ammunition, barrier materials, medical supplies, and equipment to forward units quickly by air, rail, and roads. Petroleum and ammunition accounted for half of the daily supply requirements.

Aerial resupply was useful for supporting airborne operations and emergency resupply operations, but most supplies were moved by truck and rail. As the war progressed, aerial resupply improved remarkably, as did road and rail transportation. However, resupply by air dropped off dramatically following the emergency missions to supply the 500,000 Americans participating in the Ardennes counteroffensive. After February and March 1945, air transport was used mainly for medical and petroleum resupply.

In both First and Third Armies, the resupply requirements far exceeded the ability of the transportation network to move supplies forward. In fact, by the end of August 1944, 90 to 95 percent of all supplies were still in Normandy beach depots nearly 300 miles from the forward units. To deal with these operational supply shortfalls, logisticians set up a priority system based on the amount of supplies that could be hauled by truck and rail instead of which army had priority.

Fuel Shortages

Petroleum is the lifeblood of a mechanized army. By mid-September 1944, First and Third Armies were experiencing critical fuel problems, not because of a lack of fuel at the ports and beachheads but because of a shortage of transportation to move the fuel. To help solve the problem, the Allies built a pipeline to move the petroleum 140 miles forward from the beachhead and port of Cherbourg. Once fuel reached the end of the pipeline, trucks moved it to forward supply bases. However, by 9 September, daily consumption outstripped daily receipts as Allied forces moved forward. Planned consumption was significantly underestimated, and units consumed the fuel as soon as it got to the front line. The increase in consumption rates and the lack of truck transportation were the largest contributors to the petroleum shortages. Nevertheless, fuel shortages accounted for only half of the critical shortages in the European theater. Ammunition was the other half.

Ammunition Shortfalls

Ammunition is the hardest supply to push on the battlefield because of its various types and different configurations. Ammunition arrives in theater in bulk and is broken down and loaded on trucks in configurations that maximize the space available. Problems such as a shortage of trucks, disputes over consumption rates, artillery round shortages, and production rates in the United States that couldn't keep up with demand, compounded the usual challenges of ammunition resupply.

By mid-September, Allied forces faced serious shortages and began rationing 155-millimeter howitzer and 81-millimeter mortar ammunition to the combat forces. As the war progressed, artillery expenditure rates changed from one army to the next and from one battle to the next. This made it difficult to predict the required supply rate. The Army eventually solved this problem by establishing a required supply rate and a combat supply rate. The required supply rate was the amount of ammunition a commander expected to need for a particular combat operation, while the combat supply rate was the amount of ammunition the supply system could support.

Other Supply Deficits

Although providing food, water, construction materials, and clothing to forward troops was less difficult in World War II than providing petroleum and ammunition, logisticians still faced some challenges with sustainment. Providing hot "chow" to forward units was time consuming, and it was difficult to serve units on the move. However, hot food was as big a morale boost for combat forces then as it is now.

Limited transportation made it difficult to move barrier materials to the front. It was hard to justify moving construction materials when there was not enough transportation available to move ammunition or fuel.

Clothing challenges involved everything from design and development to production problems to transportation shortages. Distribution of winter uniforms to the troops was delayed because line units did not provide the right requisitioning numbers. Winter uniforms were a very low requisitioning priority until October. By then, it was too late for every soldier to receive enough winter gear for the cold weather in December and January. Blanket requisitions did not include the needs of the civilian population, prisoners of war, and French free forces. There was a deficit of almost a million blankets by the winter of 1944.

World War II logistics was a continuous process of initiatives and experimentation to try to fit the right logistics system with the right circumstances. When logisticians found roadblocks at the strategic level, they overcame them as quickly as their communication

systems could respond. At the operational level, logistics initiatives included Mulberries to serve as expedient piers, pipelines to move fuel, and the "Red Ball Express" to push logistics to the front lines. A beachhead was established to accumulate supplies, a series of supply bases was set up along a 300-mile main supply route, and, simultaneously, air, truck, rail, and pipeline transportation was used to move supplies across the battlefield.

> "Red Ball Express" was the Army code name for a truck convoy system that stretched from St. Lo in Normandy to Paris and eventually to the front along France's northeastern borderland. The route was marked with red balls. The Army Transportation Corps created the huge trucking operation on 21 August 1944. Supply trucks started rolling on 26 August and continued for 82 days. On an average day, 900 fully loaded vehicles were on the Red Ball route around the clock, with drivers ordered to observe 60-yard intervals and a top speed of 25 miles per hour. When the program ended in mid-November 1944, Red Ball Express truckers had delivered 412,193 tons of food, gasoline, oil, lubricants, ammunition, and other essential supplies.

Timeless Logistics Lessons

Military logistics operations in World War II, the Korean War, the Vietnam War, and the Gulf War employed much of the same methodology: secure a port of debarkation, build up a supply base, and then push supplies forward by whatever means available. Even today, the commander's first strategy is typically to build up supplies and combat power over months in a theater of operations, conduct tactical operations, and then hope that supply lines remain open and capable of keeping up with the combat forces. However, as any good planner knows, "hope is not a method."

Transformation of the logistics structure must begin with the renovation of its systems, including changes in transportation and maintenance, as well as in the supply of food, water, fuel, ammunition, and barrier materials. The bottom line is: The military needs to lighten its equipment and supply loads in order to reduce its logistics tail, cut lift requirements, and, at the same time, increase force sustainability.

More Multipurpose Vehicles

The Army has already begun to reduce the weight of its combat systems by using the light armored vehicle (LAV) to increase the survivability of the light forces

and increase the maneuverability of the heavy forces with a decrease in fuel consumption. Industry can take the LAV chassis one step further by using it for logistics vehicles that will replace the wide variety of cargo- and liquid-carrying vehicles now used. A LAV chassis, enhanced with a 5-ton cargo bed and a crane for loading and unloading 463L pallets and redesigned to be C–130 transportable, is essential.

Today's family of cargo transportation vehicles consists of four distinct types: dry cargo, wet cargo, perishable cargo, and ammunition. None of these vehicles are very fuel-efficient. The newest versions are complicated to maintain, and several different types of mechanics are required to maintain them. They do not all have the same load capabilities, and they are not survivable on the modern battlefield.

If the same medium-weight chassis were used for both cargo vehicles and combat vehicles, the number of mechanics needed to repair them would be reduced. Such vehicles could keep up with the combat forces while maintaining a small degree of self-protection. A LAV equipped with a cargo bed or a pallet-mounted 3,000-gallon fuel or water tank could move cargo, fuel, or water anywhere on the battlefield. This system also could be equipped with a crew-served weapon that would provide high-volume direct fire from within the vehicle's cab.

Subsistence Transformation

Transformation of rations and the way rations and water are provided would reduce the number of personnel required to support combat forces, decrease the number of cargo vehicles needed, and reduce the overall logistics footprint on the battlefield.

The way to redesign field rations is to combine meals, ready to eat (MREs), tray rations, and unitized group rations into a "super MRE." The super MRE would be packaged, heated, and prepared much like the current MREs but would have the nutritional value, variety, and taste of fresh A rations.

The super MREs would eliminate the need for cooks, provide forward combat units with hot meals, and reduce the need for transporting large quantities of rations across the battlefield. At the same time, super MREs would ensure that even the soldiers on the most remote part of the battlefield receive a hot meal.

Water is another challenge for logisticians. Water purification and bulk water transportation across the battlefield are difficult and time consuming. Also, it is difficult to get water to soldiers in the most remote areas of the theater.

Three concepts for future water production and transportation could reduce the problems inherent in water resupply. The first is a water-production system already in concept development that extracts water from a vehicle's fuel system, purifies it, and stores it in a separate tank. This not only will increase the fuel efficiency of combat vehicles by removing wastewater but also will provide forward combat soldiers with water systems in their individual vehicles.

The second method of providing water to forward combat units is to equip each squad with a small, vehicle-mounted reverse-osmosis water purification unit with a 100- to 200-gallon storage tank.

The third method is to purchase more hard-wall bulk water tanks that mount on 463L pallets. Currently, bulk water distribution is limited to 3,000-gallon water bags hauled on trailers. These bags have to be either full or empty when hauled and cannot be easily dismounted and recovered. The hard-wall tanks could be filled with any quantity of water, dropped off anywhere on the battlefield, and picked up when empty. These tanks, which would be similar to the new "Hippo" water tank rack system, would provide more flexible water distribution. Modern technology could replace the metal tanks with composite plastic tanks, which would reduce the weight of the tank, minimize mildew buildup, and eliminate rust in the tank.

Other potential water innovations range from a personal hydration system to a solar-powered water chiller-heater that would fit inside a flak jacket. The device's solar-powered motor would chill water in hot climates and warm water in cold climates to add to the wearer's comfort and safety.

Liquid Logistics

Petroleum is the other "liquid logistics" commodity that puts a huge strain on both combat forces and logistics forces trying to move it. Until technology can provide a viable hydrogen-powered engine, petroleum will continue to be the primary fuel for powering military vehicles. Therefore, military vehicles must be lighter weight and more fuel efficient. Industry can assist with meeting these goals by equipping the new generation of combat and combat support vehicles with a simple-to-maintain battery-fuel combination engine or one that operates on fuel cells.

Another innovation for moving fuel on the battlefield is the Load-Handling System (LHS) Modular Fuel Farm (LMFF). It consists of ten 2,500-gallon tank racks and one pump rack. Like the Hippos, the LMFF tanks can be transported when full, partially filled, or empty. By using two tank racks—one on the truck and one on the trailer—a palletized load system and LHS can transport up to 5,000 gallons of bulk petroleum per trip.

Bulky Cargo

Barrier materials such as lumber, sandbags, and barbed wire are a strain on transportation systems

The LMFF is mobile when full, partically full, or empty, which decreases its deployment and recovery time.

because they are bulky, oversized, and difficult to load. The biggest problem with this type of cargo is that it comes in many different shapes and sizes, which makes it difficult to establish a standard load for a cargo vehicle.

The first step to more efficient resupply of barrier materials is the development of standard packages that would be used Army-wide. Barrier materials could be broken down and configured into lettered and numbered sets much like they are in most active-duty combat units. All packages would be assembled and configured for specific purposes, such as platoon defense, roadblock, or mine emplacement.

These configured and labeled packages would be shipped from the United States to a theater of operations, where forward combat forces could order them by citing the appropriate letter and number of the configuration they need. Preassembled, preconfigured barrier materials could be brought into the theater quickly.

Building Better Bullets

The last class of supply needing transformation is ammunition. The first of two big problems is the many different kinds of ammunition that are required on the battlefield. Having so many different kinds of ammunition makes it difficult to provide the correct ammunition during combat. The second problem is determining how much ammunition to move onto the battlefield without moving too much or too little. Too much would tie up transportation assets, and downloading unneeded ammunition would be an added burden. A shortage of ammunition would pose a serious threat to combat units during a fight.

There are many different sizes and types of ammunition in the U.S. military's inventory. To reduce the overall signature of large-caliber ammunition (above .50 caliber), for example, technology must combine similar caliber ammunition into a few interchangeable types. For example, artillery ammunition could be interchangeable with tank and large mortar ammunition, reducing at least six types of ammunition to one. Missile, rocket, and smaller mortar ammunition could be combined into another type. A standard conversion kit could accompany the two types of ammunition so they could be used quickly for whatever purpose necessary.

The biggest advantage to a revolution in ammunition development is the reduced need to carry multiple types of ammunition across the battlefield. Only high-use ammunition would flow on resupply trucks, and it would stay uploaded until it was needed by combat forces. This would help keep the combat forces supplied and allow them to stay mobile on the battlefield.

The only necessary reconfiguration of the ammunition would take place at the firing point.

Effective logistics capabilities provide the foundation that combat operators need to be persistent and decisive. Therefore, a transformation of combat operations cannot be carried out without first transforming logistics operations.

As the current U.S. military moves from a platform-based force to a capabilities-based force, logistics will play a key role in determining the success or failure of that transformation. A real logistics transformation will require new equipment, new planning techniques, and a logistics information architecture that supports the combat force.

Real-time information that enables supply requisitioning and tracking from the factory to the battlefield is critical to the success of any equipment innovations. Without such a system to complement the capabilities-based equipment, the logistics system will remain a cumbersome supply-based operation. Real-time information would eliminate many of the problems experienced during World War II, when it took months to respond to requisition changes from the front.

As recent transformations initiatives have stressed, successful capabilities-based logistics systems must be "sense-and-respond" systems that comprise two key ingredients: information and capability. Unfortunately, both the information architecture and the capabilities-based logistics equipment and systems needed for logistics transformation are still in the developmental stages. Without both ingredients, combat commanders soon will lose confidence in the ability of logisticians to provide "just-in-time" logistics and resort again to building an "Iron Mountain" of materiel as in previous conflicts. Until a global information network and a capabilities-based logistics system are implemented and validated, logistics sustainment will remain a "just-in-case" operation.   **ALOG**

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Rebalancing the Role of the Army Reserve in the Multicomponent Force Structure

by Colonel Brian D. Perry, Sr., USAR

Reports from the field indicate that the current multicomponent force (MCF) structure simply is not working.

With the transformation to an MCF, Army Reserve leaders have increasingly shifted their focus, time, and energy away from developing the difficult skills required to manage a traditional Army Reserve unit and have opted instead to fill key operational positions with Active Guard/Reserve (AGR) soldiers. The result is damage to the very fabric of the Army Reserve program—the citizen-soldiers.

Is the Army Reserve a full partner in the MCF? Or is the MCF more accurately described as an Active Army unit with Army Reserve augmentation? Is the goal of the MCF concept to assimilate Reserve component and Active-duty forces, as in "one team, one fight"? Or is the arms-length relationship among the different components being maintained purposefully? Evidence suggests the latter.

I propose a more robust Army Reserve that comprises traditional Army Reserve soldiers, led by Army Reservists, who work within a system that exploits the capabilities of citizen-soldiers more than 1 weekend a month and 2 weeks per year.

Multicomponent Structure

The term "multicomponent" usually refers to a mix of Active and Reserve component forces. However, in the Army, it could be defined as a mix of Active-duty, AGR, Army Reserve, and full-time civilian (General Schedule) personnel. Assimilating four inherently different components into a single modification table of organization and equipment (MTOE) unit is challenging.

The MCF derived its initial baseline from a standard formula used in designing Army organizations. It is not a new idea. In fact, the multicomponent structure is tried and true. The Active Army has been successful in using the MCF concept. Joint service commands have different components and services (Army, Navy, Marine Corps, and Air Force) spread out over a large geographical area under one commander. The key to their success is total and full integration—something that has not worked well for the Army Reserve.

The traditional Army Reserve structure is multicomponent. During wartime, and in training, Active Army, Army Reserve, and Army National Guard units often report to Army Reserve commands. Within the Army Reserve, the current multicomponent force structure is characterized by increased reliance on Active Army soldiers and a move toward leadership positions filled with full-time Active Army or AGR soldiers.

Force Structure Dilemmas

Field reports say that Active Army and Army Reserve soldiers are segregated within their own component structures for the purpose of evaluations. Proponents argue that the desire to achieve a participative, integrated evaluation process is admirable but unrealistic and that separate rating chains are necessary to provide soldiers with fair evaluations. Following this logic, the next stage in the development of the MCF concept will be units separated by doctrine—Active Army soldiers working as a separate unit, AGR soldiers reporting to AGR soldiers, civilians answering only to other civilians, and an Army Reserve commander having control of only a group of part-time soldiers.

To correct mission-related shortfalls, MCF unit commanders are seeking to reduce the number of Army Reserve billets further while increasing the strength of the Active Army. This comes at a time when Department of Defense officials are looking at the bottom line: Cost-wise, there is no real value to having an Army Reserve force that costs, unit by unit, the same as an Active Army force.

At a time when costs associated with deployment are being monitored closely, even proponents of the current MCF concept argue that maintaining such a force is difficult without recoding even more positions

from Army Reserve to Active Army—a move that would create more of the very problems they seek to correct.

In the past, unit cohesion and team building came from Army Reserve and Active-duty soldiers working together under strong leadership and sharing the burdens of the Active Army units. In today's MCF, many Active Army and AGR officers and soldiers have never even visited the Army Reserve unit to which they are assigned.

In the MCF structure, Active Army soldiers are assigned and rotated at regular intervals with little chance of developing team spirit. Proponents of the MCF argue that the "fix" for team spirit is to extend their assignments. That is not easy to do; Active Army assignments are set by policy. As a result, we may see a move to extend the assignments of AGR soldiers. However, there is no evidence to suggest that extending a soldier in a position, possibly against his wishes, would have a positive effect on team cohesion.

Army Reserve command staffing often migrates up from subordinate units, bringing experience and skills. Under the MCF force structure, this progression is diminished by a reduction in the number of Army Reservists holding key positions. In this context, key positions in an Army Reserve unit are not necessarily key positions for Army Reserve personnel. Subordinate AGR positions, when directed by AGR leaders, quickly become a dominant force in an Army Reserve unit.

Civilian-acquired skills have always been a recognized force multiplier in the Army Reserve. DOD reaps the benefits of education and experience without the associated costs. An increase in Active Army and AGR positions and a corresponding decrease in Army Reserve positions would reduce the value and capabilities that the citizen-soldiers bring to their positions.

One Team, One Fight

One of the main shortfalls of the MCF is the perceived need to be fully integrated as one organization while still maintaining component identity. Why would any organization strive to maintain separate identities? This, in itself, could be a setup for failure.

We all agree that, to make any interaction work, there must be a change in the military culture that separates Active Army and AGR soldiers from Army Reservists. Although MCF proponents seek to change the perception some have of slow-reacting Army Reservists sitting in offices with conspicuously empty desks and turned-off computers, they actually are fostering this perception by placing an increasing burden on the Active Army personnel and reducing the reliance on Army Reserve personnel.

A more robust Army Reserve would be organized to fight the disease and not the symptoms. This would be accomplished by equal burden sharing among all components and a strong leadership that demands a "one team, one fight" force structure. Granted, it is much easier to conduct high-tempo, real-world missions with full-time Active Army or AGR personnel than with Reservists. But are we searching for the easiest force to command or the most effective force structure for the Army?

Stereotypes and Mindsets

Active Army personnel are centrally managed and reasonably well paid and have definite terms of service. They are highly qualified in military skills. They are resilient and generally will go wherever necessary and do whatever they are asked to do, although, when given Reserve duty assignments, they sometimes go grudgingly. It does not take long for them to conclude that they are where they are because Army Reservists were unable to handle the mission. So much for breaking down the Reserve stereotype!

Army Reservists, on the other hand, volunteer for assignments with specific units and are managed more directly by the unit or command to which they are assigned. For them, deployment usually signals a reduction in salary and, of course, can cause family hardships. However, many Reservists, especially those with professional or seasonal employment, are available for additional duty. Drill pay, while adequate, is over and above what they are paid on their civilian jobs.

Army Reserve commanders must pay very close attention to operating tempo and unit morale. They must balance the unit mission carefully with workforce issues. However, the upside is that Reservists, properly managed, bring with them a great deal of experience and civilian skills. Since they are volunteers, they have a positive attitude and want to be involved. They must be assigned to positions that fit their time constraints, experience, and skills.

The practice of giving a majority of the most desirable service and civilian school positions to AGR soldiers and not to Army Reservists has become a serious morale and training issue. If the Army Reserve is expected to meet future wartime challenges, shouldn't every Reserve soldier be properly trained and employed to do that?

The MCF attempts to maintain a full-time, real-world mission for the Army Reserve. However, instead of matching a Reserve force structure with a realistic mission, the MCF seeks to acquire more full-time personnel to take on new missions. If the MCF's requirements for more full-time personnel are

not supported, adjustments in the internal component staffing will be necessary and low-priority missions will languish. The MCF continues to demand more and more personnel funding to keep up the missions it so aggressively sought.

The MCF structure is much more costly to maintain than a traditional Army Reserve unit. The MCF was developed as a "must use" force. In other words, "They cannot go to war without us." Is that mindset good for the future of the Army Reserve? Apparently not, considering public comments by the Secretary of Defense.

Last year, Secretary of Defense Donald Rumsfeld asked, "Does it make good sense for the United States of America to be totally dependent on the Guard and Reserve for a set of activities and capabilities that we now know, post 9/11, are clearly going to be things we're going to have to be doing on a fairly regular basis? . . . The short answer to that is no, it doesn't make a lot of sense."

Secretary Rumsfeld also stated, "We have to ask ourselves how ought our military be arranged in the 21st century? . . . I think you'd still have what one would call a total force concept; that is to say, a certain amount Active and a certain amount Guard and Reserve. But you'd have it better allocated between the two so there would be less stress on Guard and Reserve on a continuing basis, since we now ought to be smart enough to be better able to see what those things are."

The transition of the traditional Army Reserve—Reserve units with Active Army, AGR, and civilian personnel to support them—to the current Army Reserve that is part of a multicomponent force began during the Gulf War and continues today. But is it now time to change direction? Yes, I believe it is!

It is important for us to act now to provide the Secretary of Defense with a good vision for the Army Reserve. We need to provide him with a plan for a more robust Army Reserve—a cost-effective force that maximizes the positive elements of the Reserve.

We in the Army Reserve should present the Secretary with a plan that uses the Reserve to the best advantage. We should examine basic Reserve duty commitments. Can our citizen-soldiers be activated for extended periods of time for training and operations and still maintain civilian employment? Yes, many can.

There should be open dialogue among civilian leaders, Army Reservists, their employers, the Active Army, and the AGR. In developing a plan for a more robust Army Reserve, we should avoid secrecy. Although we will want to conceal information about capabilities and strategic plans from enemies, we must not use secrecy to prevent critics from obtaining information needed to evaluate the programs or suggest alternatives. We must be open-minded; America has an investment in the result.

All of those who help shape strategy have a huge stake in the plan. They are not likely to favor proposals that undermine positions that are financially lucrative. The military community tends to protect its own programs. Therefore, the citizen-soldiers must have a leading role in developing the Army Reserve vision.

There will be opposition to innovation and hostility toward accurate evaluation of the current MCF structure. Many will see any change as a threat to traditional roles, missions, status, and authority. That is to be expected. Nevertheless, Secretary Rumsfeld is right. America must organize its defenses in the best configuration possible to sustain any future war. That configuration must be designed carefully in order to obtain the maximum return with the minimum effort.

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> *America's citizen soldiers display values that are central to our nation: character, courage, and sacrifice. You demonstrate the highest form of citizenship. And while you may not be full-time soldiers, you are full-time patriots.*
>
> —President George W. Bush

LOG NOTES

Reservists as Contractors

In the 11 April 2002 issue of *Supply Management*, Barry Sharp, Assistant Director Commercial, United Kingdom Defence Procurement Agency, Bristol, discusses his country's procurement of tank transporter service for use in peacetime and in war. One of the conditions of the procurement was that a certain number of workers had to be trained volunteer reservists. The reservists could be called up to support operations anywhere in the world at any time. In fact, those folks were deployed during Operation Iraqi Freedom.

During Operations Enduring Freedom and Iraqi Freedom, the United States experienced problems with deploying contractors to combat zones. For the Logistics Civil Augmentation Program to be effective, contractors must be willing to work in a combat zone and must be cleared to enter U.S. facilities in other countries. The Department of Defense (DOD) continues to look for ways to increase "boots on the ground" by using contractors to replace soldiers. Perhaps the British idea of requiring their contractors to employ reservists can be adapted for use by the U.S. military. DOD could incorporate such language in the contractor's statement of work.

COL Robert F. Carpenter
Washington, DC

Repairmen Leaving the Army

The Army needs to take a serious look at the retention and readiness of its soldiers, particularly those with military occupational specialty (MOS) 91A, Medical Equipment Repairer. The 91A repairs and maintains the Army's biomedical equipment. DOD invests a large sum of training dollars in one of the best biomedical technician programs in the world. Shouldn't we be doing something to keep these trained people in the military? The DOD-trained medical equipment repairers and biomedical equipment technicians are highly sought after by the private sector and are leaving the services in large numbers.

I am a chief warrant officer in MOS 670A, Health Services Maintenance Technician. Soldiers tell me the main reason they leave is the lack of promotion opportunities. Before the Medical Reengineering Initiative took effect, a Combat Support Hospital had an E6 NCO in charge (NCOIC) position and four personnel. Now, the number of personnel is down to three. The rules say the number of personnel determines the senior rank, so the NCOIC is an E5.

Another reason technicians are leaving the service is the increased workload. We were undermanned before we began our deployments around the world. Now, the 91A assets are being stretched even more.

The rate of pay is another reason not to reenlist. Many Army Reserve soldiers are well-paid senior technicians in the private sector. When these soldiers are called to active duty as E4s or E5s, they suffer financial hardships.

The Army should survey soldiers in critical specialties and ask what will keep them in uniform. Then appropriate action should be taken before there are serious consequences.

CWO2 Robert Greenhoe, USAR
Indianapolis, IN

Bring Back the Gun Trucks

Just read your story on the Vietnam gun trucks. I am familiar with the two trucks that are pictured in the article. "Outlaw" was in the 2d Transportation Company (Medium Truck), and "Satisfaction" was assigned to the 88th Transportation Company (Light Truck). "Outlaw" was wrecked in 1971. After the 88th stand-down, "Satisfaction" was given to the 2d. The crew renamed the truck "Outlaw II."

I served on gun trucks in the 2d Transportation Company in 1970 and –71, and I believe there is a need for this type of vehicle again. Friends who are in truck companies in Iraq agree. A truck like "Satisfaction" mounting two M60s, two M240s, and an M19 would be an outstanding convoy protection vehicle—better than anything we have now. Sorry, but the M2/3s and Hummers just won't work as well. Turrets and single mounts can cover only one side of the road; gun trucks can put heavy fire to both sides. Gun trucks should be given another look.

SFC John T. Brown, USA (Ret.)
Gainesville, FL

Log Notes provides a forum for sharing your comments, thoughts, and ideas with other readers of *Army Logistician*. If you would like to comment on an *Army Logistician* article, take issue with something we've published, or share an idea on how to do things better, consider writing a letter for publication in *Log Notes*. Your letter will be edited only to meet style and space constraints. All letters must be signed and include a return address. However, you may request that your name not be published. Mail a letter to EDITOR ARMY LOGISTICIAN, ALMC, 2401 QUARTERS ROAD, FT LEE VA 23801-1705; send a FAX to (804) 765-4463 or DSN 539-4463; or send an e-mail to alog@lee.army.mil.

and its installation can be 4 to 8 months. This initiative would pursue a number of reforms to reduce delays in service.

• Eliminating hard-copy leave and earnings statements. An effort would be made to encourage employees to register with myPay and cancel mailing of their pay statements.

• Allowing DOD contractors traveling on official Government business to obtain the Government rate for travel and lodging.

• Streamlining the process for approving test and evaluation master plans. These plans currently must be approved at each milestone in an acquisition program.

• Improving the clearance process for sensitive compartmented information (SCI) for DOD contractors. This initiative would make the Army's system for speeding SCI clearances for contractors available for DOD-wide use.

BRAC FOSTERS STATIONING STRATEGY

With another round of base closures looming in 2005, the Army's Deputy Chief of Staff, G–3, Lieutenant General Richard A. Cody, has approved a strategy to govern the Army's approach to the base closure process. The Army Stationing Strategy will guide the major Army commands as they review their stationing plans in preparation for Base Realignment and Closure (BRAC) 2005.

The purpose of the stationing strategy is to ensure that, at the end of the BRAC process, the Army retains a set of multifunctional installations that allow it to meet both its Title 10 responsibilities and its transformation goals in the most cost-effective and efficient manner achievable. According to the strategy, this means, "installations that enable Army forces to support training, sustaining, mobilizing and deploying multifaceted land forces in support of Joint operations while providing quality of life of life to soldiers and their families."

The strategy notes that Army stationing is based on two interdependent factors, force structure and installations. Ideally, the Army's decisions on stationing are based on its force structure, which, in turn, is based on national strategy as defined in the Defense Planning Guidance (DPG). In a time of transformation, Army installations must be able to support the capabilities of the Current Force, the emerging Stryker Force, and the future Objective Force. To achieve this flexibility, the stationing strategy presents a set of principles to govern Army stationing decisions. Army stationing will—

• Provide sustainable facilities to support a trained and ready Army and, in some cases, other members of the joint team.

• Operate effectively at high levels of efficiency.

• Maintain flexibility to respond to new missions and functions.

• Provide minimum footprint consistent with military effectiveness and flexibility.

• Maintain forward presence at levels consistent with the DPG.

• Consider environmental impacts of stationing and training.

• Provide power projection and mobilization capability.

• Provide suitable facilities and a safe, secure working environment to promote superior quality of life for all assigned forces.

To achieve a set of installations with these capabilities, the Army will need to emphasize the use of multifunctional installations (either Army-only installations or installations shared with the other services or Defense agencies) over single-purpose installations (no matter how vital that purpose is). For industrial operations such as depots and arsenals, the Army will need to make greater use of partnerships with private companies to achieve the right mix of Government and commercial resources and capabilities. Similarly, Army medical and dental facilities will need to explore the use of partnerships with civilian medical centers, and the Reserve components will need to maximize their use of multifunctional installations, including joint-use facilities.

The stationing strategy will guide the Army in realizing the goal of Installation Vision 2010: Installations that are "every bit as lean, focused, efficient and responsive as our best warfighting units, and the very best American communities."

**FELLOWS PROGRAM ESTABLISHED
FOR FUTURE LOGISTICS LEADERS**

In July, the Office of the Secretary of Defense (OSD) announced the establishment of an OSD Supply and Transportation Fellows Program for highly

motivated military and civilian personnel with the potential to lead and manage the Department of Defense's Future Logistics Enterprise.

The new, centrally managed program is the result of the merger of the Transportation Policy and Supply Chain Integration Professional Enhancement Programs. The yearlong fellows program builds on the successes of these separate functional programs and retains many of their features.

The new program exposes participants to the full spectrum of logistics at both the department and service or agency level. For the first 6 months, participants are assigned to the OSD Transportation Policy and Supply Chain Integration Offices, where they assist with policy formulation and evaluation. During this period, OSD, the fellows' parent organizations, and the fellows themselves work together to create logistics development plans that will help the fellows reach their career goals and objectives. For the second 6-month period, the fellows rotate through other senior headquarters elements, such as the services' logistics staffs and materiel commands, the Defense Logistics Agency, the Military Traffic Management Command, and the Military Sealift Command.

More information on the program is available on the Web at www.acq.osd.mil/log/logistics_materiel_readiness/organizations/tp/html/tranmgt.html.

CREDIT CARD ORDERING OF NSN ITEMS AVAILABLE

Defense Logistics Agency (DLA) customers worldwide can order almost all DLA items that have national stock number (NSNs) and charge them to their Government credit cards using the Credit Card Ordering System (C–COS). Exceptions are those items managed by the Defense Energy Support Center.

Customers can call (877) 352–2255 and press the number 3 on the keypad when prompted. Trained order takers search the DLA supply system for the NSNs specified by the caller using the Department of Defense (DOD) EMALL. If the item is available, the order taker will ask the caller to provide the date the item is needed, the quantity needed, the shipping address, the DOD Activity Address Code, and credit card payment information.

If the item the customer wants is not available through the DOD EMALL, the caller is directed to the appropriate DLA inventory control point for assistance.

AUTO-ID TECHNOLOGY UNDER DEVELOPMENT

The next generation of radio frequency identification (RFID) technology is under development at the Auto-ID Center at the Massachusetts Institute of Technology.

Auto-ID will provide real-time global asset visibility and eliminate the need for manual counts, which ultimately will reduce the supply chain footprint and associated costs. The new Auto-ID technology is based on a 96-bit electronic product code (EPC) that can identify more than 80 thousand trillion trillion unique items. An electronic tag containing an EPC on a microchip stores and transmits data to a reader. The EPC directs users to an Internet site where information on the item is stored. The Object Naming Service, which associates the EPC with an item, directs computers to the server containing information on a specific product. Savant software technology manages the data flow from RFID readers and provides an interface to legacy systems.

The Department of Defense's (DOD's) first technology demonstration of Auto-ID at the Defense

A C–5A Galaxy is viewed through a hole in a window at Baghdad International Airport. The transport aircraft deployed to Iraq from Dover Air Force Base, Delaware, to support Operation Iraqi Freedom.

Distribution Depot San Joaquin, California, this fall will simulate rations being tracked from an assembler or depot to direct or general support supply points in a field setting with distribution to individual units. Results and lessons learned from the demonstration will help set the framework for a proposed Defense Logistics Agency advanced concept technology demonstration in 2005. Although combat rations are the demonstration product, any military item, including ammunition and spare parts, can be tracked under the program to help warfighters get what they need when they need it.

The DOD Combat Feeding Directorate at the Army Soldier Systems Center, the Defense Logistics Agency, and more than 100 companies and international research universities are sponsoring the center.

CHEMICAL AGENT DISPOSAL SPEEDS UP

Security concerns generated by the Global War on Terrorism have led the Army to accelerate its plans for destroying its stocks of lethal mustard agent at Aberdeen Proving Ground, Maryland, by as much as 3 years. The mustard agent stockpile had been scheduled for destruction by 2006.

Under the accelerated disposal process, the mustard agent will be destroyed first, with decontamination and recycling of the agent's steel containers being performed later. This will eliminate the greater risk—the mustard agent itself—earlier than if the stocks were reduced gradually, as originally planned. The secondary biotreatment phase of the disposal process will be relocated to an existing off-site commercial facility, which will further shorten the disposal time.

Mustard agent has been stored safely in the Edgewood Area of Aberdeen Proving Ground for 60 years.

NEW SUBORDINATE COMMAND ACTIVATED

The Army Deputy Chief of Staff, G–3, has approved establishment of the Air Traffic Services Command (ATSCOM) as a subordinate command of the Army Forces Command.

ATSCOM will provide airspace and air traffic services support to Army warfighters, major Army commands, and installations and ensure the safety of operations, standardization, and controller/unit certification of Army air traffic control. The new command also is charged with providing functional area support to meet the Army requirements for airspace and air traffic services to operate in joint and combined environments and in national and international airspace.

ATSCOM should achieve full operational capability by 31 January 2004.

Writing for *Army Logistician*

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

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

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

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

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

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

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Coming in Future Issues—

- **What's Missing With SOF Logistics**

- **Role of Civilians During the First Gulf War**

- **An Army Learns on Its Stomach**

- **Logistics Risk in the Stryker Brigade Combat Team**

- **Radio Frequency Identification**

- **Unmanned Aerial Logistics Vehicles**

- **Conventional Class VIII System for a Nonconventional War**

- **The Assignment Process**

- **Every Soldier a Rifleman**

- **Deployment of a Thai Coalition Engineer Unit**

- **Management of Contractors in Joint Operations**