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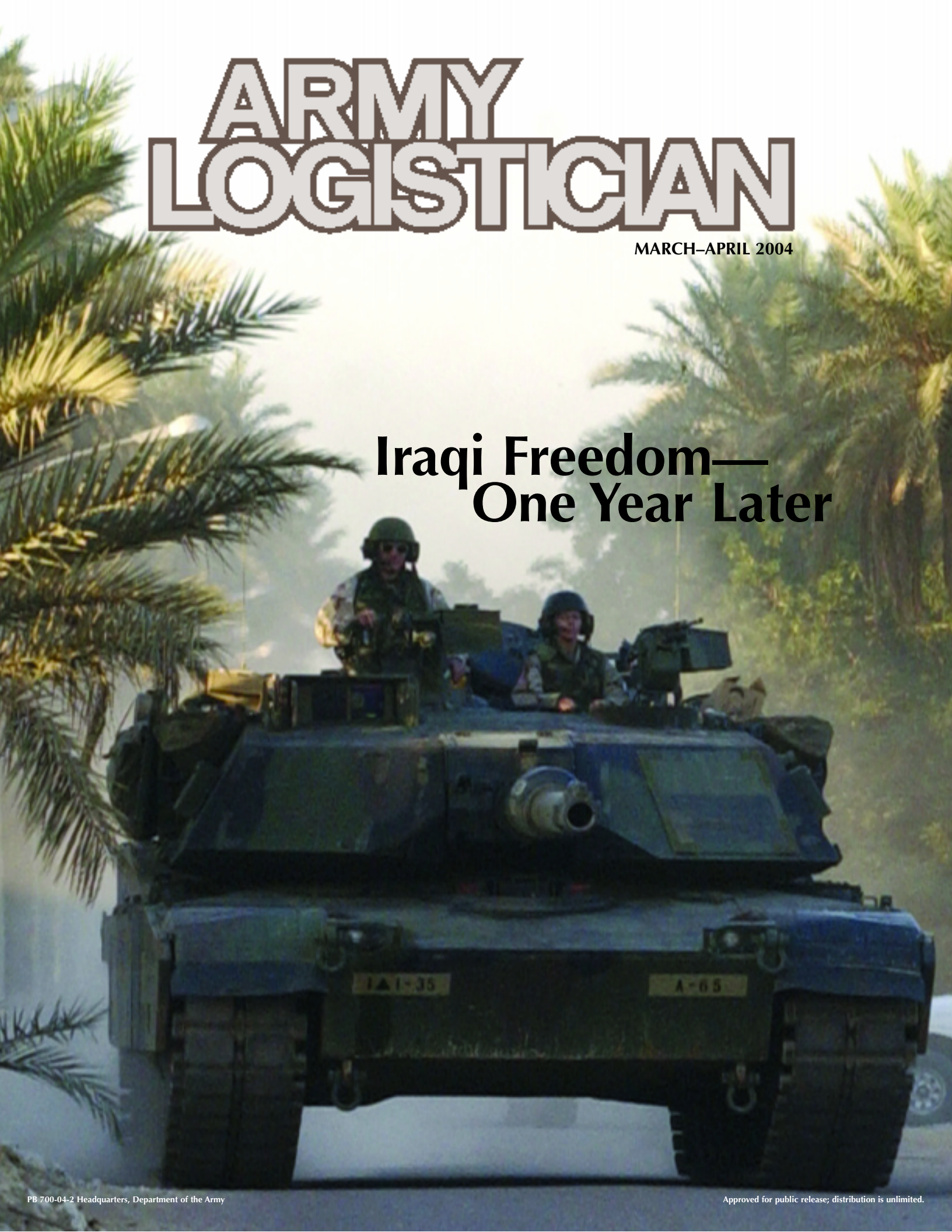

Iraqi Freedom— One Year Later

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Cover: An M1A1 Abrams tank from the 2d Brigade Combat Team, 1st Armored Division, drives through Baghdad, Iraq. The article beginning on page 24 commemorates the 1-year anniversary of the beginning of Operation Iraqi Freedom and presents a collection of images of sustainers who are working to stabilize and rebuild Iraq and provide humanitarian support to the Iraqi people.

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

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ALOG NEWS

A Stryker vehicle is driven off the USNS Sisler *during offloading operations at a port in Kuwait.*

STRYKERS BEGIN COMBAT OPERATIONS IN IRAQ

Stryker vehicles carrying two companies of soldiers were attacked by automatic weapons and rocket-propelled grenades while on patrol in Samarra, Iraq, on 15 December, marking the first time the vehicles engaged in combat since their arrival in theater. Although the fast-moving, eight-wheeled Stryker infantry carriers withstood the initial attacks, three vehicles were knocked out of commission several days later by enemy fire.

Stryker vehicles from the 3d Brigade, 2d Infantry Division, arrived at a port in Kuwait on 12 November after a 3-week voyage from Fort Lewis, Washington, on board the *USNS Schughart* and *USNS Sisler*. Soon after the ships docked, advance-party crews from the 3d Brigade and members of the 598th Transportation Company (Forward), an Army Reserve unit deployed to Kuwait, unleashed the vehicles and prepared them for unloading and travel by convoy to Camp Udari in northern Kuwait.

Soldiers from Camp Udari drove the vehicles back to each company's motor pool, where wrap-around slat armor was added by a team of soldiers and General Dynamics contractors. Permanent, reactive armor for the Strykers will be available later this year.

The Stryker vehicle, shown here with temporary slat armor, provides transportation and protection for soldiers conducting route reconnaissance and combat operations in Samarra, Iraq.

ARMY OUTLINES 'THE WAY AHEAD'

In November, the Army published an online document called "The Way Ahead," which lays out a plan to increase Army wartime relevance and readiness and institutionalize a joint and expeditionary mindset that reflects the Army's interrelationships with the Air Force, Navy, and Marine Corps.

To provide more modularity and flexibility, the Army will reorganize its combat and institutional organizations and redesign its formations. It also will rebalance the Active and Reserve components and train its leaders and soldiers to be adaptable.

According to Army Chief of Staff General Peter J. Schoomaker, "We are reexamining doctrine, training, and systems to support joint and expeditionary capabilities, along with our ability to sustain land campaigns during war fighting and peacekeeping."

Army agencies currently are developing plans that will implement focus areas established by General Schoomaker. These focus areas are—

- Develop flexible, adaptive, and competent soldiers with a warrior ethos.
- Prepare future generations of senior leaders. Identify and prepare Army leaders for key positions within joint, interagency, multinational, and service organizations.
- Focus training at combat training centers and in the Battle Command Training Program to meet requirements of the current security context and the joint and expeditionary team.
- Train and educate Army members of the joint team.
- Conduct a holistic review of Army aviation and its role on the joint battlefield.
- Accelerate fielding of select Future Force capabilities to enhance effectiveness of the Current Force. Army Transformation is a part of constant change.

(ALOG NEWS *continued on page 45)*

LOG NOTES

Potential Problems With Fuel Blending

Your November–December 2003 issue contained an article that I found very interesting. The article, "Blending Used Oil and Vehicle Fuel," gave the reader a clear description of this used oil disposal practice. The advantages of using this practice were clearly listed, but the potential problems were merely mentioned without an explanation ("Oil blending has many advantages and *a few disadvantages*.").

The author mentions that this practice was approved by the Army's Tank-automotive and Armaments Command, but recent findings have revealed a potential problem area. At the October 2003 Society of Automotive Engineers meeting in Pittsburgh, SAE Paper #2003–01–3139, Interaction Between Fuel Additive and Oil Contaminant: Field Experiences, reported that mixing engine oil with fuel can cause fuel filter plugging. The following comments were taken from the paper:

> The normal range of engine oil mixing into the fuel due to high pressure injection is less than 0.1% while the disposal mixing is generally less than 0.5%. This practice (i.e., the disposal mixing) has been exercised for decades without much problem if the used oil is properly filtered. However, recent field experiences have indicated that interaction between engine oil components and some acidic additives in the fuel can cause premature fuel filter plugging. This is of immediate concern as customers can not predict which fuels have problematic additives.

The concern is that because filtering cannot remove the additive components or their reaction products from the engine oil, these elements will be available to react with the acidic additives that are present in some fuels, primarily the dimer-type corrosion inhibitors (MIL–PRF–25017) that are mandated in fuels such as JP8, JP5, and even some of the ground diesel fuels.

Since the author recommends that the oil-blending device be required in all maintenance activities, readers should be aware of this possible problem. One might say, "All that glitters is not necessarily gold."

Maurice E. Le Pera
Harrisonburg, VA

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DOD Maintenance Depots Prove Their Worth

BY THE HONORABLE DIANE K. MORALES

The Global War on Terrorism has allowed the Department of Defense's in-house maintainers to demonstrate their vital role in supporting combat in Afghanistan and Iraq.

During Operation Enduring Freedom in Afghanistan and Operation Iraqi Freedom, the Department of Defense (DOD) depot maintenance system demonstrated the critical role it plays in successfully supporting U.S. combat power. During the buildup and execution of those operations, more than 60,000 men and women who work in DOD's in-house maintenance depots met numerous challenges as they responded to the changing needs of American warfighters. In Afghanistan, our forces were ready for combat within only 28 days; in Iraq, we sustained our coalition forces under the most difficult circumstances.

A machinist at Rock Island Arsenal, Illinois, works at a horizontal machining center.

DOD depots can repair everything from aircraft to combat vehicles to ships to sophisticated technological defense systems. All of these items reach the depots in need of repair and must leave in perfect working condition. Depot workers can take fighter jets down to their skeletons and build them back up again; they can dismantle multibillion-dollar aircraft carriers and rebuild them stronger and more capable than before. However, the expertise and capabilities of DOD's depots are not limited to working on such "heavy iron" items. Depot workers also are capable of fixing software, electronics, munitions, and test sets.

Long before coalition forces deployed to Afghanistan and Iraq, silent but critical preparations began throughout the DOD depot maintenance community. Dedicated depot maintainers responded to a wide range of requirements—fixing fleet-wide problems, increasing inventories of repaired parts, and developing unique modifications to prepare weapon systems for the demands of the impending desert battlefield. Many of these maintainers then deployed to forward locations to help our warfighters keep equipment operational and to repair equipment damaged in battle.

Keeping Army Helicopter Fleets Ready

UH–60 Black Hawk and CH–47 Chinook helicopters are two of the mainstays of the Army's aviation capabilities. The Black Hawk is the Army's front-line utility helicopter and is used for air assault, air cavalry, and aeromedical evacuation (MEDEVAC) operations. The Chinook is often the only mode of transportation available to move large numbers of personnel, equipment, and supplies rapidly over the vast areas in which U.S. forces operate. Both aircraft experienced fleet-wide problems during 2002 that threatened to keep them grounded and could have significantly affected combat planning and execution of Operations Enduring Freedom and Iraqi Freedom. However, maintainers at Corpus Christi Army Depot, Texas, applied their considerable skills to the challenges, ensuring that

UH–60s and CH–47s were available and ready to meet all requirements.

In mid-2002, while conducting routine aircraft inspections, Army maintainers found cracks in a critical UH–60 transmission component. Because of the severity of the problem, the entire fleet of 968 UH–60 helicopters was grounded. Depot maintainers from Corpus Christi were called on to address the problem with the suspect part by completely overhauling all transmissions in the fleet. Within 11 days, the depot had tripled its production and was able to provide transmissions for Black Hawks supporting MEDEVAC operations in Afghanistan. Corpus Christi maintainers continued to increase production to support this fleet-wide problem, quickly reaching a production rate five times greater than normal.

Late in 2002, a Chinook experienced the failure of a component known as a swashplate, a crucial flight control component. The Army immediately grounded the entire Chinook fleet of 463 aircraft pending inspection and development of a fix for the problem. Once again, Corpus Christi Army Depot responded by going into full-surge mode, increasing production from a routine 16 swashplates per month to 170 fully overhauled swashplates within 9 weeks. This surge enabled the Army to continue operating the Chinooks and to replenish the war reserve pool for the operational requirements that would soon surface in Iraq.

Preparing for and Sustaining Combat Operations

In late 2002, Anniston Army Depot, Alabama, began an effort to ensure that the right parts would be repaired and ready when needed. Depot personnel increased production of a wide variety of turbine engines, mechanical components, and electronics. In some cases, engine production was doubled. From circuit cards to servos to M16A2 rifles, Anniston responded successfully to every call for increased production to support possible combat operations. [A servo is a feedback system used in the automatic control of a machine.] The depot even repaired ribbon bridge sections throughout the 2002 Christmas season, delivering more than 100 badly needed sections by the end of the year.

At Warner Robins Air Logistics Center, Georgia, maintainers responded quickly to a requirement to accelerate repairs on Special Operations C–130 aircraft and return them to operational forces. They completed repairs of AC–130 Gunships and MC–130 Combat Talon aircraft an average of 52 days ahead of schedule. Warner Robins maintainers also developed critical software changes that improved the operation of fighter data link capabilities, which provided Air Force combat aircraft with critical, real-time situational awareness.

In addition to maintaining their ongoing workloads, workers at Letterkenny Army Depot, Pennsylvania, assumed the challenge of quickly modifying dozens of high-mobility, multipurpose, wheeled vehicles (HMMWVs) for the Army Special Forces and Navy Seals. The modifications included AC (alternating current) power inverters, on-board compressors, special machinegun mounts, and missile and smoke grenade launcher systems. Letterkenny took these modifications from drawings through prototypes and into quick production—all in a very short time to meet the warfighter's requirements.

As part of its planning for potential operations in Iraq, the Navy wanted 12 of the F/A–18C Hornet fighters that were in depots for repair returned to fleet organizations as soon as possible. Naval Air Depot North Island, California, responded quickly to this request, eventually returning 20 of the Navy's primary aircraft to the fleet in record time and before military action began.

Tobyhanna Army Depot, Pennsylvania, faced several challenges in responding to numerous requirements for electronic component support. Tobyhanna workers fabricated hundreds of Blue Force Tracking installation kits. These kits use satellite links to show friendly and enemy positions in various Army, Marine Corps, and allied units. Depot workers also created programs to meet requirements for items such as infrared jamming systems, radar warning receivers, communications systems, and laser range finders. All of these items were needed to operate effectively in the desert environment and give our troops the advantages they needed to prevail in combat operations and reduce the possibility of friendly fire incidents.

In support of the 3d Armored Cavalry Regiment, Red River Army Depot, Texas, equipped more than 230 M2/3 Bradley fighting vehicles with Blue Force Tracking systems. Red River maintainers went on site with 3d Armored Cavalry Regiment troops and provided the necessary training so the soldiers could take full advantage of the capabilities of their new equipment. Red River also remanufactured an additional 63,000 track shoes and road wheels for Army combat vehicles, along with 450 engines and transmissions.

Making Something Out of Nothing

DOD depots have full manufacturing capabilities and, under certain circumstances, are authorized to manufacture critically needed items. Often they are the only source for parts needed to keep maintenance lines moving and to prevent backups throughout the supply chain. DOD depots can manufacture one part or a thousand—quickly and efficiently—depending on the requirement.

For example, the Marine Corps' AV–8B Harrier

A sheet metal mechanic works on a C–130 oil cooler duct at Warner Robins Air Logistics Center.

aircraft developed a problem with the loss of chaff dispensers during flight. [A chaff dispenser releases materials (chaff) designed to deceive a radar-guided missile fired at an aircraft.] Naval Air Depot Cherry Point, North Carolina, designed a new bracket to retain the dispenser and then produced the needed parts for installing that bracket. Working from newly drafted blueprints, the depot machine shop worked around the clock to produce 404 bracket kits that were immediately installed on Pacific and Atlantic Fleet aircraft. Responding quickly to these types of critical needs is a hallmark of the DOD depot structure.

Tactical satellite systems provide essential circuits for secure and nonsecure voice, data, and teletype communications. Tobyhanna Army Depot designed and fabricated filter kits for satellite communications terminals to ensure that they would operate reliably in the deserts of Kuwait and Iraq. The kits were very successful, giving deployed forces the terminal performance and reliability they required.

Naval Air Depot North Island added 930 production runs, representing 6,300 parts, in January 2003 alone. One of the critically needed parts it manufactured was a "doubler" for repair of an HH–1N Iroquois helicopter in Kuwait. The HH–1N was one of the few rescue helicopters available to the Navy, and this part was essential to returning the aircraft to service.

Deploying Forward

To carry out their missions effectively, depot maintainers go into the field, onto Navy ships, and into the theater of operations to support our warfighters. Depots variously use field service teams, voyage repair teams, battle damage repair teams, and forward repair activities to get their technicians and artisans into the combat zone and to the equipment that needs repair or support. The austere environment of these operations places unique demands on the maintainers.

Maintainers from Red River and Anniston Army Depots deployed to Kuwait to establish a forward repair activity to service items such as engines, transmissions, final drives, and generators; they also were capable of repairing combat vehicles. Maintainers on the Naval Air Depot North Island voyage repair team also contributed to the effort, making critical repairs aboard the aircraft carriers *USS Nimitz* and *USS Abraham Lincoln* in preparation for key combat operations. North Island field service teams also visited a number of aircraft carriers during their deployments, repairing Hornets and F/A–18E/F Super Hornets that otherwise would have been out of action.

Tobyhanna Army Depot sent a team of electronics experts to Kuwait to assist deployed Marine Corps units using the AN/TRC–170 communications system. The team ensured that the Marines could use the system successfully and that the system would perform at a peak level throughout combat operations.

Most combat equipment used in OEF and OIF was, at one time or another, rebuilt by one of DOD's maintenance depots. The depots proved again that they are always ready. They responded to virtually every maintenance, repair, and manufacturing requirement in support of U.S. forces and their combat equipment. Maintainers skilled in working on systems ranging from high technology materials to microelectronics were ready to take on any challenge, anywhere. They worked tirelessly behind the scenes with courage and commitment. The depots' highly skilled and motivated workforces deserve our thanks for a job well done and our appreciation of the formidable capabilities they offer in support of our combat forces. **ALOG**

The Honorable Diane K. Morales is the Deputy Under Secretary of Defense for Logistics and Materiel Readiness. Secretary Morales leads an effort called the Future Logistics Enterprise (FLE), which is DOD's near-term logistics transformation strategy. She is a graduate of the University of Texas and served as Deputy Assistant Secretary of Defense for Logistics from 1990 to 1993.

Managing Contractors in Joint Operations: Filling the Gaps in Doctrine

BY COMMANDER MICHAEL MCPEAK, USN, AND SANDRA N. ELLIS

Contractors on the battlefield have become a fact of life for the armed services. But comprehensive doctrine on how the services should manage those contractors is lacking.

Over time, the United States has shifted away from employing forces composed primarily of Active component units operating independently to increased dependence on a mix of Active and Reserve components, civilian contractors, and multinational forces in joint and combined operations. Civilian contractors now are performing support missions in a variety of contingency environments that historically have been the responsibility of uniformed military forces. Since Operation Desert Storm, more and more contractors have supported deployed forces.

Three key factors have contributed to the increase in the number of civilian contractors supporting deployed forces—

- Force reductions.
- Growing reliance on contractors to provide initial or lifetime support for high-tech weapon systems.
- Adoption of commercial business practices and outsourcing or privatizing functions that in the past were routinely performed by military personnel.

These changes have affected the way military forces are employed. However, significant gaps remain in the doctrine governing management of contractors. Overarching Department of Defense (DOD) policy does not exist to manage adequately the increasing number of contractors on the battlefield and their impact on combatant commanders. For example—

- A lack of integration of the acquisition and logistics communities has reduced the level of coordination between those who procure systems and those who use them. The acquisition and logistics communities have no standards or requirements for integrating contractor logistics support (CLS) with the operational plans and missions of combatant commanders.
- The flow of contractor personnel and materiel into and within the theater continues to be overlooked in deliberate planning.
- Each armed service has its own distinct processes and organizations for managing deployed contractor personnel, such as the Army's Logistics Civilian Augmentation Program (LOGCAP), the Navy's Construction Capabilities Contract Program, and the Air Force's Contract Augmentation Program. These programs remain separate and uncoordinated, which results in disjointed policies, duplication of capabilities, and different styles of management.

Further shifts in warfighting capabilities are underway. The services are reassessing their missions and core competencies and refining their support of the National Military Strategy. New missions are being assigned, and new weapon systems and logistics doctrine are being incorporated into future warfighting plans. The Joint Vision and the Focused Logistics Campaign Plan outline additional strategies for supporting the new force capabilities and missions. Support agencies are transitioning to new procedures and making new arrangements with commercial partners to take advantage of processes that have proven effective and efficient in the civilian sector.

Challenges of Using Contractors

Contractor support has become embedded in service programs. The combined effects of defense budget decreases, force reductions, reengineering initiatives, the privatization of duties historically performed by military personnel, the introduction of

Contractors work on an M60A3 tank in Germany.

increasingly complex technology, and increased mission requirements and operational tempo have shifted the mix of support needed to carry out mission objectives in a theater of operations. The supported combatant commanders and the services are beginning to recognize the extent of their reliance on nonuniformed support.

To resolve the challenges inherent in using contractors, the combatant commanders and the services must begin to routinely include information about contractor support in their planning processes. They must be aware of the contractors who will be working in and around their areas of responsibility. Maintaining visibility of contractors and coordinating their movements are vital if the combatant commander is to manage his available assets and capabilities efficiently and effectively.

Contracts for services must be created with input from both the planner and the warfighter. The combatant commander is responsible for the flow of equipment, personnel, and materiel into his theater. Contractor personnel are not part of the operational chain of command, and properly coordinating contractor support and the flow of arriving contractor materiel often has been a significant theater logistics concern. The uncoordinated flow of contractor personnel and equipment can compete with military personnel and equipment for airlift, aerial ports of debarkation, other types of transportation, and road and railroad networks, both intratheater and intertheater. Commercial support personnel and materiel often arrive in theater unannounced. As a result, the combatant commander can lose his ability to plan and prioritize movement and distribution throughout the theater.

The services currently are operating with little joint doctrine or guidance on managing contractors, so they are crafting their own policies and guidelines. However, a preliminary review of this guidance reveals policy that is disparate, inadequate, and contradictory.

The lack of awareness of contractors and their presence in supporting combat operations has resulted in—

- Significant gaps in operational doctrine on who is responsible for securing lines of communication used by commercial suppliers.
- Loss of visibility of assets moving in and around the theater of operations.
- Loss of control of contractor personnel and equipment.
- Increased service responsibility for supporting contractor personnel in the areas of life support, force protection, and operational and administrative control.
- Use of additional manpower, materiel, and funding resources to support contractor personnel.
- Concern about the availability of commercial supplies and services in a hostile environment.
- Gaps in providing logistics support if commercial supply lines become disrupted.

This World War I poster demonstrates that contractors have always played a significant role in the Nation's defense. Their expanding presence on the battlefield is a recent development.

These problems have resulted, in part, from the lack of full integration of the acquisition and logistics communities. This lack of integration results in service program offices, materiel commands, and inventory control points writing logistics support contracts independently, without considering how to integrate logistics support in the theater of operations and how to handle the ensuing management challenges facing the combatant commander. The presence of contractor personnel in the theater may place the responsibility for their force protection, clothing, housing, medical care, and transportation on the combatant commander, but he lacks the overarching doctrine needed to address the multitude of issues that result from the presence of contractors. Status of Forces Agreements and other arrangements with host nations may complicate the combatant commander's situation by restricting contractors' entry, movement, and actions.

Focused Logistics Warfighting

Focused Logistics Warfighting (FLOW) was the first forum in which CLS management challenges were portrayed clearly and graphically. FLOW is an innovative logistics assessment tool used by military and DOD analysts to debate and resolve questions about joint and combined logistics capabilities. FLOW is the only dedicated effort within DOD that concentrates specifically on joint and combined logistics warfighting capabilities.

The Joint Staff J–4 has oversight of the FLOW process. A designated service acts as host, with host responsibilities rotating among the Army, Navy, Air Force, and Marine Corps. The Defense Logistics Agency (DLA) also participates as an equal partner in FLOW and has hosted several major FLOW events at DLA headquarters at Fort Belvoir, Virginia. The Navy and the Air Force hosted the first two FLOW events, in 1999 and 2001 respectively. The Army hosted FLOW 2003 at the Army War College at Carlisle Barracks, Pennsylvania, from 20 to 23 October 2003.

The assessment results from FLOW illustrate the magnitude of the CLS management challenge. FLOW 2001 played a "show of force" scenario in Southwest Asia. The contractors the Army needed to support operations numbered over 753 (not including LOGCAP support) at five locations in Bahrain, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates. LOGCAP contractors provided life support and base support for incoming forces. The numbers demonstrated the impact of contractors, both positively and negatively, in the combatant commander's area of responsibility and on mission accomplishment. To resolve problems, each service was tasked to review contracts on two or three weapon systems, with an emphasis on performing risk analyses and reviewing the support arrangements for their impact on the combatant commander.

FLOW 2003 carried the assessment of contractor support a step further. The scenario included a "line in the sand" beyond which specific systems contractors could not go. This limitation was included in the scenario to assess the impact the restrictions on contractors had on system maintenance and support. The results were provided back to the appropriate weapon system program office for further study.

The ultimate goal of FLOW is integration of contractor personnel and equipment into various planning documents to cover all types of contractors. The reception, staging, onward movement, and integration process, which has been identified as a means of controlling contractors' entry and movement throughout a theater of operations, should be refined. FLOW proved to be not only the vehicle that graphically illustrated contractor presence but also the tool that allowed recommendations for improvements to be developed.

Joint Doctrine

The combatant commander is burdened with the responsibility for maintaining management control of the contractors in his geographic area. This burden has been placed on him without the development of joint doctrine to help him carry out this responsibility.

As a result of FLOW 2001, an Acquisition Deskbook Supplement, Contractors in the Theater of Operations, was written. This supplement contains recommendations for combatant commanders, service planners, contracting officers, and contractors to use as they plan military operations. It contains suggested contract clauses, a checklist to use when considering the impact of contractors on combatant commanders, and a template for gathering and entering contractor information into the deliberate planning process. This process focuses on assessing the potential burdens and risks of using contractor personnel. (See http://deskbook.dau.mil/jsp/default.jsp.)

In addition to the desk book supplement, the Joint Staff in June 2000 revised Joint Publication (JP) 4–0, Doctrine for Logistic Support of Joint Operations, by adding Chapter 5, Contractors in the Theater. This chapter provides a framework for addressing the issue of managing contractors in a theater. The revision makes an attempt to more clearly define the responsibilities and liabilities associated with using commercial suppliers to support joint military operations, but it does not adequately address the broad spectrum of issues that have been raised by current operations.

Not only is joint doctrine very limited, but the doctrine that is provided is spread among several publications that are the responsibility of various Joint Staff directorates. For example, JP 1–0, Doctrine for Personnel Support to Joint Operations, covers issues of contractor accountability, requirements, and support and services in a very limited way and contradicts JP 4–0 on providing security for contractor personnel.

Service Doctrine

The services have begun to address issues of managing contractor support within their own domains. The Army recently published new memoranda implementing new management procedures for contractors deploying to support weapon systems. Recent experience has led the Army to conclude that there are significant shortfalls in its current procedures for managing commercial suppliers and to produce guidance to compensate for the void in joint doctrine. The January 2003 publication of Army Field Manual 3–100.21, Contractors on the Battlefield, provides significant direction to commanders and their staffs to use

Civilian contractors and soldiers set up the tents for a tactical operations center at Wright Army Airfield, Georgia, during an exercise.

when planning operations that include contractor support. The Army has also created several Web sites that bring together the vast amount of information on this topic. The Army Field Support Command created a site (www.osc.army.mil/others/Gca/battle2.htm) that seeks to "accumulate and offer materials helpful to the resolution of legal issues arising from the in-theater use of contractor support to military operations." The Army Materiel Command also has a Web site devoted to making this information readily accessible (www.amc.army.mil/amc/rda/rda-ac/ck/ck-prime.htm).

The Army has engaged the RAND Corporation to conduct two studies: "Analytic Method to Determine the Minimum Military Essential Logistics Capability," sponsored by the Combined Arms Support Command, and "The Role and Limits of Outsourcing," sponsored by the Assistant Secretary of the Army for Manpower and Reserve Affairs. The first study will assess the Army's level of dependence on contractors during deployed operations and provide an analytical method for determining the appropriate mix of Active and Reserve component soldiers, Government civilians, and contractors to perform combat support and combat service support missions. The ultimate goal is to ensure that using CLS does not degrade military capabilities. The second study will review the processes the Army uses to plan weapon system support to determine if those processes include the use of contractor support. If those processes do not incorporate contractor support, the study will recommend ways to modify them so they better assess risks.

The Marine Corps has published an order providing guidance for planning contractor support in a theater. The Marine focus is on maintaining a core expeditionary capability and ensuring that planned logistics support, whether organic or commercial, will not adversely affect that capability.

There is a growing consensus at the action and flag officer levels that managing contractors is a vital issue that requires immediate attention because it affects the ability of the combatant commander to execute his responsibilities. To overcome the doctrinal void in this area, the individual services are promulgating doctrine and policies. But this has resulted in differing solutions to the issues of managing contractors and does not provide the combatant commander a single source of reference.

Additional DOD-sponsored efforts, such as the Executive Agent (EA) program being developed under the Future Logistics Enterprise initiative by the Deputy Under Secretary of Defense for Logistics and Materiel Readiness, will significantly influence the use of contractor support. Under the EA program, materiel support will be provided by a single manager appointed to oversee the sourcing and movement of supplies for combatant commanders and the services. The creation of additional joint doctrine will ensure that joint risk assessments study the vulnerabilities of procedures and that plans fully support the warfighter.

A working group of FLOW participants, recognizing the lack of DOD policy on managing contractors, came together to draft a DOD directive to establish strategic-level guidance. This draft guidance, which is sponsored by the Under Secretary of Defense for Acquisition, Technology, and Logistics, will lay out the strategic policy for managing contractors in joint operations. The overarching DOD policy will provide the foundation for modifying existing doctrine and developing any new joint doctrine as required.

Ultimately, a joint publication is needed that clearly provides overarching doctrine for managing commercial suppliers. This publication would support the services' initiatives to assess their core organic logistics capabilities and ensure that they are structured appropriately to operate in a combat environment. Joint processes would decrease the redundant use of contractors, standardize contracts and contracting procedures, and establish the authorities, responsibilities, and relationships needed to fill the current gap in joint doctrine. **ALOG**

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Airfield Seizure Combat Health Support

BY CAPTAIN BRIAN J. BENDER

Airborne operations and airfield seizures are inherently dangerous. The danger arises from the fact that, during airfield seizures, paratroopers typically conduct a parachute assault deep into enemy territory in the midst of a pitched battle and are at great risk of incurring multiple injuries and wounds. Consequently, medics are always needed on the drop zone (DZ). Throughout the Army's history of airborne operations, combat health support (CHS) has proven to be a significant combat multiplier to conserve fighting strength. In World War II, medics jumped with their units and established medical clearing stations on the DZs of France and The Netherlands. In fact, many of these medical clearing stations landed in gliders on austere landing zones.

Since World War II, medical personnel have jumped in all airborne operations. During Operation Just Cause in December 1989, medics from battalion aid stations and medical personnel from the 307th Medical Battalion participated in airborne operations during the seizure of Panama's Torrijos-Tocumen Airport. Medical personnel were with the 82d Airborne Division en route to Haiti in September 1994 during Operation Uphold Democracy when the division was turned back from the jump. Most recently, medics were among the "Sky Soldiers" of the 173d Airborne Brigade who parachuted into northern Iraq to seize key objectives during Operation Iraqi Freedom.

Airfield Seizure

The 82d Airborne Division's mission is to "deploy worldwide within 18 hours of notification, execute a parachute assault, conduct combat operations, and win." Seizing an airfield is critical to the success of their combat operations. Airfield seizures are executed to secure key terrain that can be used to create a lodgment that will enable the continuous flow of combat power and supplies into an area of operations. The key tasks associated with an airfield seizure are—

- Conducting pre-assault fires to suppress enemy air defenses.
- Seizing assault objectives and key facilities to eliminate a direct-fire threat.
- Blocking high-speed avenues of approach.
- Repairing the field landing site to receive airland forces.
- Seizing key terrain in and around the airhead so the enemy cannot observe the airfield. [An airhead is a designated area in a hostile or threatened territory that, when seized and defended, ensures the continuous airlanding of troops and equipment.]

Organization

Airborne operations have changed little since World War II. Medical personnel still accompany the infantrymen, artillerymen, and engineers, known as alpha echelon, who execute a parachute assault to conduct and support airfield seizure. Medical personnel are cross-loaded onto multiple aircraft to ensure that the loss of one aircraft does not keep the mission from being completed. Some of the medical personnel who parachute onto the objective are members of the infantry battalion's medical platoon. Generally, 16 to 20 medical personnel, including line medics with the rifle companies, physician assistants, and physicians from the medical treatment squads of the medical platoon's battalion aid station (BAS), jump with the initial assault forces onto the airfield.

Twenty-five medical personnel from the division's forward support medical company (FSMC) also jump during an airfield seizure. The FSMC personnel typically include two seven-man treatment squads that have one physician's assistant each, five ambulance platoon personnel, the dental officer (who serves as triage officer), a patient administration specialist, a laboratory technician, the treatment and ambulance platoon leaders, a communication specialist, and the company commander. These numbers can be tailored to support the mission.

The division's organic forward surgical team (FST) is normally attached to the FSMC during an airfield seizure. Since only limited numbers of support

personnel accompany the infantrymen in the initial assault, the FST usually is split into two sections—one that parachutes into combat and one that arrives later aboard an Air Force cargo aircraft. The parachute assault section usually includes two surgeons, four operating room nurses, one nurse anesthetist, two practical nurses, and three operating room technicians.

The bravo echelon is made up of personnel who do not jump but arrive on fixed-wing aircraft. If the airfield has only minimal damage, the bravo echelon should begin arriving at P+6 (6 hours after the first jumper leaves the first aircraft). The rest of the infantry battalion BASs arrive among these elements. Similarly, the remainder of the FSMC, consisting mostly of the area support treatment squad, the area support squad, and the company headquarters, also arrives by airland. The FSMC also is normally augmented with combat stress control and preventive medicine assets from the division's main medical support company.

Heavy Drops

In addition to personnel requirements for conducting airfield seizures, military equipment is required. Medics must have medical equipment to provide CHS successfully during an airborne assault. Although all medics jump with an aid bag in their packs, most of the equipment they need arrives on vehicles that are heavy-dropped before the paratroopers jump. A heavy drop is defined as any large piece of equipment that can be rigged to a G–11B heavy-cargo parachute. The heavy-drop equipment is rigged before the plane is loaded, and, immediately before any paratroopers jump, Air Force personnel push the loads from the ramp of the aircraft for deployment on the battlefield.

The BAS usually heavy-drops one M998 cargo high-mobility, multipurpose, wheeled vehicle (HMMWV) containing trauma and sick call medical equipment sets, tents, litters, and generators. The FSMC usually heavy-drops two M998 cargo HMMWVs and one M998 with mounted radios for command and control. The FSMC cargo vehicles contain the same types of equipment as the BAS vehicles, but twice the amount. The FSMC also has 15 units of blood strapped into the passenger seat of each M998 cargo vehicle. An FST heavy drop consists of two M998 cargo vehicles carrying a surgical medical equipment set, operating room tables, 30 units of blood, tents, and generators. Once downloaded on the objective, the heavy-drop vehicles become evacuation platforms.

Airborne Operations

An airborne operation begins at parachute-hour (P-hour), which is when the first paratrooper exits the first aircraft. Once on the ground, an airborne medic must get out of his parachute harness, ready his weapon for operation, pick up his equipment, and move to his planned assembly area. The place where the FSMC normally assembles is called an "assembly area support" and is typically located on the DZ, away from the major initial assault objectives.

The FSMC commander must execute several tasks within the first few hours of the operation. First, he must account for all of his personnel. The division standing operating procedure requires the commander to have 90-percent troop accountability by P+1. Second, he must establish the capability to treat and

C Company, 307th Forward Support Battalion, treats casualties at a triage area set up near the road. The treatment teams are in the foreground. The tent at left in the background houses the forward surgical team.

Paratoopers from the 82d Airborne Division evacuate a comrade on the drop zone.

evacuate casualties. Establishing this capability involves the commander sending out a heavy-drop recovery team with security to locate, derig, and return with the FSMC's three heavy-drop HMMWVs. Third, a helicopter landing zone for medical evacuation (MEDEVAC) must be established before P+2 for evacuating casualties to a level III or higher medical facility. [A level III medical facility is normally a corps-level medical treatment facility that has intensive care and resuscitative surgery capabilities.] An ambulance platoon two-person team with a radio must establish the pickup zone (PZ) by P+2. The treatment platoon must assemble the advanced trauma life support (ATLS) tents and equipment by P+2 to receive, treat, and prepare casualties for further evacuation.

Part of the establishment of the treatment area includes the FST. The FST tent is set up next to the FSMC ATLS tent. The dental officer triages casualties and sends them to either the FST tent for surgery or the ATLS tent for treatment and stabilization. Once a patient is stabilized, he is placed in the appropriate evacuation category (Urgent—evacuate within 2 hours; Priority—evacuate within 4 hours; or Routine—evacuate within 24 hours) and then taken to the MEDEVAC PZ for evacuation by helicopter to the nearest level III facility. At the FSMC treatment area, casualties are manifested and moved by HMMWV or M-Gator to the field landing site for fixed-wing evacuation from the theater. [An M-Gator is a multipurpose six-wheeled, all-terrain vehicle used primarily for casualty evacuation and supply.] Medics accompany these casualties and monitor them while they await evacuation.

Flexibility is key to success. All medics must be able to perform each medical task on the DZ regardless of their rank or section assignment. For example, treatment personnel also must be prepared to establish the MEDEVAC PZ if needed.

Airfield Seizure CHS Assembly Plan

Normally, two infantry battalions under the command and control of a brigade task force headquarters execute airfield seizures. Therefore, two BASs typically take part in an airfield seizure.

CHS assets initially present on the DZ usually are limited. Therefore, a thorough CHS assembly plan must be developed that includes using all available assets for evacuation and treatment of casualties. For example, during one rotation at the Joint Readiness Training Center (JRTC) at Fort Polk, Louisiana, the BASs and FSMC operated together on the DZ to provide CHS. The factors of mission, enemy, troops, time, terrain, and civilians (METT–TC) drove this collaboration, which enabled the brigade task force to combine limited treatment teams and evacuation personnel and vehicles.

Drop Zone Evacuation

As mentioned, evacuation assets are very limited on the DZ. Front line ambulances are not part of the initial airfield seizure package; instead, nonstandard M998 cargo HMMWVs are the preferred evacuation

platforms. The medical team does not have enough assets to conduct all evacuations alone, so M-Gators, antitank vehicles, and mortar vehicles also must be used.

In the event of a true no-notice deployment of the 82d Airborne Division to a remote location, it may be impossible to have dedicated rotary-wing aircraft for support. In such a situation, the 82d Airborne Division must work with Air Force medical personnel to coordinate the strategic lift of casualties from the DZ. The Air Force's Aeromedical Evacuation Liaison Team (AELT) is designed to help the FSMC plan, coordinate, and certify the evacuation of casualties on fixed-wing aircraft. The AELT usually works directly with the FSMC commander. Together, they work to evacuate casualties as quickly as possible. The sooner casualties are certified and manifested, the sooner they are evacuated to higher echelons of medical care. Therefore, it is critical to have all patients manifested by the AELT before the first aircraft lands.

A mobile aeromedical staging facility (MASF) also can play a critical role in evacuation from the DZ. A MASF is an Air Force asset designed to provide shelter, medical supplies, and medical care while casualties are awaiting evacuation. The MASF can be located near the "hammerhead" of the field landing site. [The hammerhead is the area of the runway where aircraft normally turn around.]

Drop Zone Sweeps

It is imperative to provide rapid treatment and evacuation of soldiers in the DZ. To accomplish this, dismounted and vehicle-mounted medical personnel must sweep the DZ for casualties. To avoid fratricide, initial assault objectives should be secure before the DZ sweep is executed. To conduct the sweep, the DZ is divided into grid sectors, and the BASs and the FSMC sweep the sector assigned to them. Established routes are used in each sector. Depending on the terrain, medics may need to dismount and walk through areas where casualties may be concealed.

A DZ sweep can be difficult to accomplish because of limited evacuation assets. A balance must be established between sending assets on DZ sweeps and evacuating casualties from casualty-collection points.

Follow-on Missions

Out-of-sector air assaults are common follow-on missions after securing the airfield and subsequent objectives. Rotary-wing aircraft from an intermediate staging base usually land on the airfield to load paratroopers for the air-assault mission. Casualties from the air assault are loaded on the last aircraft and flown back to the PZ, where they are offloaded and treated by the medical personnel. Once stabilized at the PZ, the casualties are evacuated to the FSMC or the nearest level III medical facility. This mission is accomplished by a treatment team from either the BAS or the FSMC, depending on the size and complexity of the air assault operation.

Ground Operations

As the infantry battalions clear their assigned areas and expand the lodgment, they move and their BASs follow. The bravo echelon arrives once the field landing site is cleared and repaired. When the planes arriving with the bravo echelon land and the vehicles and equipment are offloaded, the arrival airfield control group receives the vehicles and places them into unit chalks (convoy groups).

The FSMC vehicles will be directed to the brigade support area (BSA) and will arrive according to a priority vehicle listing. The first vehicle in the priority vehicle listing is usually a light medium tactical vehicle (LMTV) loaded with area support treatment equipment. Once this vehicle arrives in the BSA and links up with the FSMC quartering party, it is downloaded and the area support treatment squad establishes its area.

The FSMC BSA quartering party typically consists of the treatment platoon sergeant, a physician's assistant, and two medics. The treatment platoon sergeant calls the FSMC commander and informs him that he is ready to receive casualties at the BSA. Once this information is sent to the brigade, the patient flow shifts from the DZ ATLS tent to the BSA for treatment. The MEDEVAC PZ is moved from the DZ to the BSA. Once downloaded, the LMTVs are moved to the DZ ATLS site. The LMTVs then move casualties from the DZ to the BSA or, depending on the scenario, to the field landing site for fixed-wing evacuation.

Assets are limited during an airfield seizure. Medics have important responsibilities, so they must move quickly at the assembly area and recover the heavy-drop vehicles that contain their equipment. Evacuation assets are limited on the DZ, so the evacuation plan must be well integrated into the overall plan. A well-planned, rehearsed, and executed combat health support plan can save many lives during an airfield seizure. **ALOG**

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Joint Medical Asset Repository

BY COMMANDER DAVID B. STRATTON, USN, AND MAJOR MARK W. DICK

Every day, combat forces across the globe train, mobilize, and deploy in response to world events. These movements produce unique needs for information, asset visibility, and technology. Without question, the successful deployment of our operating forces relies on countless factors, including force health protection and readiness; mobile, tailored, and flexible deployment planning; and force sustainment. In turn, these factors depend heavily on medical materiel to support the mission.

The emergence of near-real-time medical materiel asset visibility plays a pivotal role in saving lives. The Joint Medical Asset Repository (JMAR), which provides this Web-based visibility, keeps cadence with the daunting pace of force readiness by capturing, storing, and making medical asset data readily available. JMAR supports the missions of medical logisticians everywhere.

Medical logisticians use various communication methods to locate needed medical commodities and get them to the right place at the right time. JMAR is their tool of choice to accomplish this.

JMAR is the single authoritative source for acquiring, managing, and providing timely and accurate joint medical asset visibility information. It captures, integrates, and stores data in a central repository with Web-based access.

Designed by the Army Medical Materiel Agency in 1996, JMAR offers a unique view of critical military and commercial medical commodities. In December 2001, JMAR was fully integrated into the Defense Medical Logistics Standard Support (DMLSS) Program. JMAR is the component of the DMLSS automated information system that supports the military's joint medical logistics information management effort and the Department of Defense (DOD) Military Health System (MHS).

JMAR supports the tenets of Joint Vision 2010 and Joint Vision 2020. It provides invaluable data for operations, medical logistics posture planning, and supply chain management for MHS operational forces and hospitals. The MHS uses new technologies and information provided by JMAR to decrease costs, improve logistics distribution management, refine business processes, and support the warfighter.

Joint Vision 2020—Focused Logistics

Beans, fuel, bullets, and bandages, known in the supply community as classes I, III, V, and VIII respectively, are precious commodities for our Armed Forces. Whether the supported activity is a deployed medical logistics supply operation, Naval fleet hospital, Air Force expeditionary medical system, or military hospital, focused logistics sustains our forces by providing total asset visibility of medical commodities.

Joint total asset visibility (JTAV), provides customers with timely and accurate information on the location, movement, status, and identity of units, personnel, equipment, and supplies. Without appropriate vaccines, medicines, or functional medical equipment on hand, the lives, health, and safety of our forces are at stake. JMAR sends data to the JTAV database daily, serving as the single authoritative source of medical asset data.

JMAR does not create new data; it captures and consolidates existing data from disparate legacy and replacement medical logistics sources. It provides asset visibility along all points of the medical logistics pipeline, including—

- In-storage materiel at unit and retail consumer sites, intermediate storage sites, disposal activities, and within wholesale inventories, including prepositioned assets ashore and afloat and contractual and noncontractual assets stored at commercial sites.

JMAR does not create new data; it captures and consolidates existing data from disparate legacy and replacement medical logistics sources.

• In-process materiel on order from DOD vendors but not yet shipped and assets in repair at depot-level organic or commercial repair facilities, intermediate repair facilities, and unit-level repair facilities. In-process also refers to blood or blood products that are pending quality certification testing.

• In-transit materiel within the transportation pipeline.

• In-theater materiel located within a theater of operations.

Medical logistics assets pass through multiple places during their journey from manufacturer to theater. JMAR offers an extensive array of easily accessible reports designed to provide essential asset visibility and create business intelligence products on assemblages (sets, kits, and outfits for medical units) and facilities. Command-level decisionmakers, as well as item managers, medical commodity managers, and clinicians, use JMAR to increase readiness and streamline acquisitions.

Types of Data Captured

JMAR is currently in Phase II—the Active component phase of its development cycle. Scheduled for completion by the end of fiscal year 2005, the goal of Phase II is to capture and integrate into JMAR relevant logistics data for all service-owned Active component medical materiel and secondary items. JMAR collects data on chemical defense materiel; vaccines; antibiotics pre-positioned for wartime use; blood and blood products for military use; prime vendor, medical, surgical, and pharmaceutical data; and vendor-managed exigency contract inventories. These data sources provide military medical materiel visibility, information on medical equipment in medical assemblages and hospitals, and facility management information.

The JMAR Web user interface offers assistance with informative pop-up logistics definitions, real-time notices, and "drill-down" reports. To further ease navigation, JMAR organizes data queries by data type, such as inventory management, quality assurance, prime vendor, and equipment. Future integrations will include facility management, medical assemblages, patient movement items, and, potentially, non-DOD Federal assets.

Architecture and Security

By providing total asset visibility of medical materiel, JMAR standardizes logistics data and reduces the time that healthcare professionals spend on logistics. The key features of the JMAR architecture include integration of asset databases; real-time connectivity for updates of information; and access to JMAR by any user, at any time, on any machine.

The JMAR Web user interface offers assistance with informative pop-up logistics definitions, real-time notices, and "drill-down" reports.

Data from multiple DOD-, service-, and unit-level databases populate the JMAR database. By using file transfers, JMAR obtains data from selected systems and loads them into its database. This makes the data available to JTAV and agency requests through output feeds or the World Wide Web. This strategy provides data visibility to all users and meets the Web-based standard of Defense Reform Initiative Directive 54.

The JMAR program manager maintains access security and can limit data accessibility when necessary. At the network level, firewall security is provided for communications into the JMAR server. A staging server isolates data being transferred into JMAR and checks data and files for viruses. Virtual Database Mediator provides its own security for JTAV access to the JMAR database server. User security for JMAR is maintained through individual user identifications and passwords. Secure Sockets Layer encryption serves to protect passwords and data transmitted through the Web browser. [The Secure Sockets Layer is a protocol commonly used to manage the security of a message transmission on the Internet.]

Business Practices

JMAR's vision also embraces the goals of reduced DOD inventory investments, improved supply chain management, and increased use of business intelligence to capture and help manage MHS expenditures. Over $2.3 billion in annual purchases and over $19 billion in annual operating costs are required to maintain the MHS infrastructure. JMAR captures legacy data and produces business intelligence solutions to streamline and encourage refinement of business processes for decision support.

JMAR's prime vendor report is an initial proof of concept that summarizes expenditure data compiled from the Prime Vendor Program and other sources when medical commodities are ordered. At some facilities, most of the orders are placed with vendors other than the prime vendor supporting that facility. JMAR's prime vendor reports identify efficiencies and

unplanned or increased expenditures for supplies that are available at contracted, fixed costs.

Executive Dashboard Initiative

The JMAR team is ambitiously researching and designing for the future. It continues to enhance real-time snapshots of medical asset data to make JMAR responsive to JTAV and to medical logisticians worldwide. The DMLSS JMAR leaders recently completed a review of responses to a request for proposal (RFP) submitted for an executive dashboard for use in business intelligence and decision support initiatives. [An executive dashboard is a Web-based information system that provides executives with a dashboard view of a company's performance goals compared to actual results.] The RFP was submitted under the Small Business Innovation Research (SBIR) Fast Track program sponsored by DOD, which provides funding for research, development, and testing of DOD-specific or commercially usable products.

The executive dashboard will capture internal and external metrics and important requirements in a user-friendly graphic user interface. Using the SBIR program has allowed the JMAR team to pursue research and development funding from DOD programs while conserving and applying scarce resources for continued integration of over 55 development efforts. This type of innovative and collaborative initiative makes use of the full spectrum of defense funding. Using business intelligence tools also provides trend analysis and reveals areas for improvement. Through these targeted and powerful reporting capabilities, JMAR improves overall supply chain management.

Immediately following the 11 September 2001 attacks on the World Trade Center and the Pentagon, JMAR processed requests for medical asset information. In support of Operation Noble Eagle, the JMAR staff provided data on vaccines, burn dressings, intravenous solution bags, facemasks, eye care solutions, and other medical necessities.

Operation Noble Eagle

Immediately following the 11 September 2001 attacks on the World Trade Center and the Pentagon, JMAR processed requests for medical asset information. In support of Operation Noble Eagle, the JMAR staff provided data on vaccines, burn dressings, intravenous solution bags, facemasks, eye care solutions, and other medical necessities. This lifesaving information was sent to Army, Air Force, and Navy emergency operations centers.

JMAR provided medical logistics agencies with listings of materiel potentially needed to meet requirements created by mass casualties and future attacks and for force protection at DOD installations. With the support of JMAR, medical logisticians in the Army operations centers were able to use asset data to inform leaders about on-hand assets to support homeland defense and plan for future worldwide operations.

JMAR is a robust Web application that uses leading-edge technology to store medical logistics asset information for medical logistics units, planners, hospitals, and deployed forces around the globe. JMAR provides precise information on medical assets during both wartime and peacetime, meeting the DOD Joint Vision 2020 goals for focused medical logistics, information superiority, and full-spectrum dominance.

When complete, JMAR will be the central hub for joint visibility of all medical materiel and equipment and will serve as the single, recognized, authoritative source for all military medical materiel assets. JMAR achieves its mission by providing global access to joint medical asset information for anyone, anytime, and on any machine. More information about JMAR can be found at http://jmar.detrick.army.mil. **ALOG**

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Parts Tracker—A Unique Tool for the Warfighter

BY FRANCIS LEONG

Every day, thousands of requisitions flow through the military requisitioning pipeline. Although it is important to track requisitioned items in peacetime, war makes the need for tracking these items critical. Maintenance personnel need a query tool that indicates where critical parts can be found. They also need to know the transportation mode and expected delivery date of shipments. For requisitions that are rejected at the national inventory control point (NICP), maintenance personnel need to know the reason for the rejection and whom to contact for further details and options. Item managers at the NICP need to know when items are received by customers.

The Army Materiel Command Logistics Support Activity's (LOGSA's) Parts Tracker meets those needs at the tactical and strategic levels by providing the status of requisitions in the supply and transportation pipeline. This visibility is achieved by capturing and displaying data, including the location and date of each segment of a shipment from the time it originates at the source of supply through the military or commercial transportation pipeline to its receipt by the customer. The segments include source of supply, depot, consolidated containerization point, port, supply support activity, and customer receipt.

Parts Tracker provides a tracking capability similar to that of commercial carriers such as the United Parcel Service and Federal Express. Visibility of military shipments presents a challenge because of the broad scope of information that must be collected from disparate commercial and military systems.

For a commercial carrier shipment, LOGSA must be able to capture and process the data generated by that carrier. A shipment traveling through military distribution channels requires many different methods to capture data needed to maintain visibility through various transportation means. These include the use of document identifier codes familiar to the military world and the use of radio frequency identification (RFID) tag technology.

If a shipment is moving by military transportation and an RFID tag is attached to the container, the information on the tag can be accessed through Parts Tracker's RFID tag query. Many layers of information can be obtained through this query—the current date, time, and location of the container; the consignor, consignee, and carrier owner; the container's consolidation transportation control number (TCN); and all shipment-related TCNs. A query by RFID tag number will show the historical record of the container, including locations, dates, and times for each of its movements. A detailed query of the RFID tag will provide information on all items in that container by nomenclature, document number, package suffix code, national stock number, quantity, hub receipt date, and ship date.

Parts Tracker provides query by document number, which is unique to the military requisitioning environment. The upgraded "Parts Tracker Plus" will offer enhanced capabilities that will accommodate more powerful queries by warfighters, item managers, and data analysts. The first of these enhancements will provide a multiple document number query that will allow the customer to query up to 5 document numbers simultaneously. The output will show all of the document numbers queried, national stock numbers, nomenclature, quantities, and requisition status. Enhancements to the document number query function also will include the ability to obtain information on rejected or cancelled requisitions. This information will include the reason for rejection or cancellation and the NICP point of contact, which will enable the customer to communicate with the item manager for advice on how to get the requisition filled.

Current development includes initiatives to permit queries by Department of Defense activity address code (DODAAC), RFID tag, TCN, and commercial tracking number. The ability to query by DODAAC is crucial at the tactical level for capturing all requisitions associated with a specific unit or supply support activity. This query will show requisitions by weekly segments, with output similar to that offered by the multiple document number query. Queries by RFID tag and the commercial tracking number will provide a portal for direct access to information currently obtained only by drilling down through links in the document number query. Query by TCN will provide in-the-box visibility by document number level for all shipments for that TCN. Because of the large number of packages in combined shipments, maintaining visibility down to individual items is crucial. This visibility provides more efficient and accurate logistics information, which is vital to military success.

Parts Tracker will integrate seamlessly with other LOGSA data bases to provide on-the-pallet and in-the-container visibility using clear language that does not use codes and acronyms. This format will provide information that can be read and understood across a multitude of boundaries. Parts Tracker offers a powerful tool for analysis of readiness, maintenance, and supply business processes at the tactical, operational, and strategic levels.

ALOG

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First in Support—The 21st

BY COLONEL GARY R. MEDEN, USAR

We've all seen images of the soldiers fighting in Iraq. They appear to have the equipment, supplies, food, water, and other items they need to accomplish their mission and live in reasonable comfort. Did you ever wonder how these soldiers reached the area, or how they get their supplies and equipment? More often than not, the answer is that they were transported and are supplied by the 21st Theater Support Command (TSC).

The 21st TSC is the largest Army logistics command in the world. It is forward-deployed in Kaiserslautern, Germany, can deploy worldwide, is expeditionary in focus, and has soldiers and civilians in 5 to 10 countries at any given time. The 21st TSC's mission is to provide theater sustainment, force projection support, and expeditionary logistics to Army, joint, combined, and multinational forces in support of the U.S. Army Europe (USAREUR) and combatant commanders. Its motto sums up its mission—*First in Support!*

Organization

The 21st TSC is a multicomponent organization with a mix of Active Army, Army National Guard, and Army Reserve personnel, Department of the Army civilians, and local nationals. It consists of a headquarters and five major subordinate (brigade-equivalent) commands that work interdependently to accomplish the TSC's support missions. They are the—

- 1st Transportation Movement Control Agency.
- 29th Support Group.
- 37th Transportation Command.
- 200th Materiel Management Center.
- General Support Center-Europe.

The 21st TSC provides strategic-, operational-, and tactical-level support to customers throughout the U.S. European Command (EUCOM) area of operations, including units in USAREUR and those that are deployed in support of exercises and operations. It is the single largest employer of local nationals in USAREUR and the second largest employer in Kaiserslautern.

The command participates in 15 to 20 military exercises each year in support of USAREUR, the North Atlantic Treaty Organization (NATO), EUCOM, and the Joint Staff. Since 1995, it has performed reception, staging, and onward movement (RSO) and sustainment functions for Stabilization Forces in the Balkans and, since 1999, for the Kosovo Peacekeeping Force.

Contingency Operations

When Operation Enduring Freedom (OEF) began, the 21st TSC immediately stood up its emergency operations center and began contingency logistics planning. The U.S. Central Command (CENTCOM) and EUCOM tasked the 21st TSC to support OEF combat and humanitarian missions simultaneously because it was the only forward-deployed logistics command positioned to support both unified commands. From October 2001 through March 2002, it provided supply, transportation, maintenance, and airdrop rigging support 24 hours a day, 7 days a week, and processed units through its Deployment Processing Center (DPC) to the OEF area of operations. Task Force Firepower, led by the command's 191st Ordnance Battalion—the Army's lead element for CENTCOM humanitarian relief efforts—rigged over 1.7 million pounds of wheat, nearly 69,000 blankets, and over 2.2 million humanitarian daily rations in Kaiserslautern, moved them by intratheater airlift to Incirlik, Turkey, transferred them onto Special Operations Forces aircraft, and airdropped them directly into Afghanistan in more than 5,000 Tri-wall Aerial Delivery System (TRIADS) boxes.

One of the most significant feats accomplished by the 21st TSC for OEF was the opening of a 4,000-mile rail line of communication (LOC) in December 2001 from Germany through Poland, Ukraine, Kazakhstan, and Russia to Uzbekistan. The shipping time for containers filled with Defense Logistics Agency and Army and Air Force Exchange Service cargo over this route averaged less than 26 days.

Operation Iraqi Freedom

Planning for Operation Iraqi Freedom (OIF) started in the 21st TSC long before the operation had a name.

Theater Support Command

The port at Iskenderun, Turkey, swarms with activity in support of Operation Iraqi Freedom.

The command focused on moving equipment by rail, road, and barge to seaports for subsequent movement to the CENTCOM area of operations and on opening ground LOCs through Turkey to support a potential northern front in Iraq. This support included deploying a command and control element and a significant number of logistics forces into Turkey to set up logistics nodes; opening seaport, rail, and road networks; and preparing for RSO of the 4th Infantry Division (Mechanized) and other combat forces through Turkey into northern Iraq.

The Army Reserve component of the 21st TSC, designated as the 21st TSC (Continental United States [CONUS]), is a vital element of the 21st TSC team. The Indianapolis, Indiana-based 21st TSC (CONUS) was alerted of potential activation to support

The USNS Antares *is offloaded at the port.*

operations in CENTCOM on 15 November 2002, and, on 5 December, its personnel began 10 days of active duty for training in preparation for activation. On 18 December, the 21st TSC (CONUS) moved to its mobilization station at Fort Knox, Kentucky. On 5 January 2003, over 200 21st TSC Army Reserve soldiers deployed to Ramstein Air Base, Germany, and quickly integrated into 21st TSC operations. The 200th Materiel Management Center (MMC), a multicomponent unit of more than 250 National Guard soldiers, also deployed to Germany in January and quickly joined their Active component counterparts in Kaiserslautern to support OIF.

In Germany, the 21st TSC (CONUS) was responsible for moving V Corps headquarters, separate brigades, and USAREUR aviation assets through Germany, Belgium, The Netherlands, and Luxembourg to the ports of Antwerp, Belgium, and Rotterdam, The Netherlands, and for moving ammunition to the port of Nordenham, Germany. The 21st TSC set up port support activities and life support areas at the ports and coordinated all road, rail, barge, and ship movements of equipment out of the Central Region of Europe into the Iraqi theater of operations.

On 20 February, the 21st TSC's early-entry command post deployed to Incirlik, Turkey. This was the Army's first deployment of an already forward-deployed theater support command headquarters. Approximately 100 personnel deployed initially, and 1,100 follow-on forces from several subordinate units of the command quickly followed. The commander and staff performed as a major subordinate command of Army Forces Turkey (ARFOR–T), but, on redeployment of the 1st Infantry Division (Mechanized) headquarters to Germany in early April, they were designated as the ARFOR–T commander and staff. They reported directly to CENTCOM's Task Force North in Ankara, Turkey, and provided support to USAREUR and EUCOM.

As soon as a facility was available, the 21st TSC command post moved to Mardin, Turkey. The central location made it easier for the command to control the RSO of units through Turkey. A theater distribution center was set up in the town of Nusaybin, which is east of Mardin. Rail and road LOCs were used to move equipment and supplies for 21st TSC subordinate units and 1st Infantry Division units. The LOCs also had the capability to deploy 4th Infantry Division and other units if required.

One road bridge along the LOC did not have the load capacity to withstand heavy equipment transporters loaded with M1 Abrams tanks. Through close coordination with the Army Corps of Engineers, a bypass was constructed to support the heavy loads. Although the 4th Infantry Division did not move through Turkey, the 21st TSC successfully transported food, water, and fuel by contract carrier through Turkey into Iraq over the road LOC.

Once the airfield in Bashur, Iraq, was open, the 21st TSC sent an air expediter team from the 200th MMC to support units there. Support to Joint Special Operations Task Force-North (JSOTF–N) units at this and other northern Iraq locations was timely and accurate. Parts for critical end items typically were located and sent by air within 24 hours of the requests.

The 21st TSC opened several nodes in Turkey, including a theater distribution center at Nusaybin, a seaport at Iskenderun, an airport at Oguzeli, and railheads at multiple locations. The subordinate unit commanders became node commanders. The command subsequently opened and used the airport and seaport at

Constanta, Romania, to support JSOTF–N operations. The 21st TSC also had liaison officers in over a dozen headquarters in Turkey, Iraq, Qatar, Israel, Kuwait, and other locations.

The 21st TSC also contributed greatly to OIF success with its efforts in Central Europe. It operated five German convoy support centers; completed 161 barge missions, more than 200 rail missions, and over 1,700 truck missions; and moved over 25,000 pieces of equipment. The 21st TSC also prepared over 1,000 pieces of equipment for transport by aircraft originating from Ramstein Air Base. It packaged and transported approximately 200 helicopters and processed more than 25,000 passengers through the DPC. The DPC also prepared the USAREUR Immediate Ready Force (IRF) for deployment directly into northern Iraq. This was the first contingency deployment of the IRF.

Commanders at all levels of the 21st TSC stressed force protection throughout the operation. At times, force protection may have caused some operations to be less efficient than they would have been in other environments. For example, it was decided that tactical and nontactical vehicles would be driven only for short distances or when escorted by Turkish Jandarma (paramilitary forces under joint Interior Ministry and military control). This meant that all military vehicles moving from the seaport at Iskenderun had to be hauled on semitrailer trucks by commercial contract carriers. The 21st TSC's force protection measures proved to be prudent, because all of its soldiers returned to Germany safely.

Military vehicles are loaded onto contracted commercial trucks for transport through Turkey.

Although the 4th Infantry Division did not move into Iraq, the Iraqi Government could not dismiss the potential of a northern front because of the ground LOC the 21st TSC had opened through Turkey to Iraq. The command's ability to adapt quickly to changing situations by split-basing its command and control headquarters and its ability to provide the right support at the right time and place confirmed its exceptional value to the Army. Remarkably, the 21st TSC performed all of its missions without firing a single bullet, demonstrating that sometimes logistics is "mightier than the sword."

On 23 March, the Chief of Staff of the Army, General Eric K. Shinseki, sent the following message to the 21st TSC—

> Thanks for a job well done . . . I want to thank you and your magnificent soldiers for the tremendous performance executed in Turkey. Your extensive planning and preparation for the RSOI [reception, staging, onward movement, and integration] of the 4th Infantry Division set the conditions for the Army to be able to deploy from Turkey . . . Your achievements have been simply remarkable. We are all proud of you.

The 21st TSC will continue to support a myriad of expeditionary operations concurrently in order to provide the soldier in the foxhole with the best support possible. It will continue to be the capable, flexible, scalable theater logistics unit that can best provide support in Germany, Italy, Belgium, The Netherlands, and Luxembourg, as well as in expeditionary locations in Europe and Southwest Asia. It will man, arm, fuel, fix, move, and sustain the units that provide forward-positioned forces.

The next time you see soldiers in harm's way in Europe or Southwest Asia, you can rest assured they have to worry only about the fight—not their logistics support. The 21st TSC, which stands by its motto—First in Support!—takes care of that. **ALOG**

Colonel Gary R. Meden, USAR, served as the G–4 and engineer of the 21st Theater Support Command in Turkey in support of Operation Iraqi Freedom. He is a graduate of the Army War College. As a civilian, he is the Chief of the Project Management Branch, Army Corps of Engineers, in Wiesbaden, Germany.

Improving Equipment Management With Triple Containers

by First Lieutenant Nathan D. Williams

Adjustable bracing can be installed in a container so materiel will not move during shipping.

Deploying any Army unit is a challenging task. For a petroleum supply company, the challenge is greater than most. A petroleum supply company conducts missions that support divisional and nondivisional units with bulk petroleum storage systems. These missions require an abundant supply of petroleum equipment that includes 12 fuel system supply points (FSSPs). Each FSSP contains 169 separate components of varying sizes and shapes, so a petroleum supply company deploys over 2,000 components for its FSSPs alone. To complete its mission, the company has additional petroleum equipment, life and operational support equipment, and vehicles and trailers. Storing, maintaining, and shipping all of the company's equipment is a daunting task. The type and configuration of its storage facilities or containers make a big difference in how efficiently the unit deploys and performs its mission.

In 2002, the 110th Quartermaster Company, a petroleum supply company at Hunter Army Airfield, Georgia, received new triple containers, or TRICONs, to assist in managing its equipment. These containers have enabled the unit to improve the way it stores and ships equipment.

Description

The TRICONs are manufactured by Charleston Marine Containers, Inc., in Charleston, South Carolina. Each container measures 8 feet high, 8 feet wide, and 6½ feet deep, has a maximum gross weight of 14,900 pounds, and can carry a payload of 12,300 pounds. Each TRICON can be moved or shipped individually or connected side by side to two other TRICONs and configured with dimensions similar to those of a 20-foot MILVAN (military-owned, demountable container). Each TRICON has internal mounting brackets for adjustable beams that can be used to configure its interior.

The containers that the 110th received came with document holders on the inside and outside of the

doors and a holding rack for the assemblies that connect the containers together.

Advantages

Since a TRICON is smaller than a 20-foot MILVAN, it can be handled and moved by a 10,000-pound-capacity forklift as long as the overall gross weight of the container does not exceed the lifting capacity of the forklift. Many Army units are authorized 10,000-pound-capacity forklifts. A petroleum supply company, for example, is authorized six. Having the capability to move containers without external support gives the unit more control in mission planning and execution.

Because TRICONs can be connected and configured in dimensions similar to a 20-foot MILVAN, they can be handled by a rough-terrain container handler (RTCH). This compensates for the fact that using the TRICONs triples the number of containers a unit must move. If RTCH assets are available when shipping TRICONS to a port, the containers can be connected and moved in groups of three.

TRICONs store equipment in a configuration that makes the equipment relatively visible and easy to reach, compared to a 20-foot MILVAN that may have to be completely downloaded just to reach one piece of equipment in the back of the container. To accommodate the variety of shapes and sizes of the equipment that a petroleum supply company uses, a container must be versatile. Unlike modular containers, the entire internal space of TRICONs can be used. A container with no set compartments or shelves can be modified and improved. The adjustable and removable beams also offer an additional option for configuring the container to the specific dimensions needed for each piece of equipment.

The 110th placed its TRICONs on the unit property book so they could be retained in the unit permanently. This gives the unit the ability to pack the equipment when it is not in use and maintain it so it will be ready to ship at a moment's notice. Previously, the 110th had to pick up 20-foot containers from a draw yard and begin the packing process after receiving the call to deploy, leaving very little time to pack the numerous 20-foot MILVANS needed to move its equipment. Using the TRICONs to store equipment frees up needed warehouse space and offers the unit a way to organize its equipment into separate units or sets. The 110th was able to create a more organized system for storing its equipment, free up storage space, and reduce the amount of time needed to prepare for a deployment.

Application

The 110th used the TRICONs to pack their 12 FSSPs separately in sets using 12 containers per system. Several FSSP components that would be needed in the same area on the battlefield were packed together in one TRICON. This assisted in emplacing the FSSP by saving the time and effort needed to move containers to get equipment to several areas at the fuel system site. By packing the equipment in several containers, the system could remain operational despite losing some system components if a container were misplaced during shipment.

Testing

The 110th was able to field the TRICONs and determine their advantages during Operation Iraqi Freedom. In January 2003, the company deployed all of its nonrolling stock, including their 12 FSSPs, in TRICONs. On 21 March, 1 day after the ground war of Operation Iraqi Freedom began, the 110th sent a platoon with its FSSPs into the southern region of Iraq to set up a 1.2-million-gallon bulk fuel storage site. Because of carefully planned packing of the FSSPs in the TRICONs and the ability to move the containers with assets organic to the unit, the platoon was able to receive fuel in the system within 2 hours of starting construction and to complete the setup of the system in less than 24 hours. The speedy construction of the site helped the 3d Infantry Division (Mechanized) meet its fuel requirements as it pushed north through Iraq. The success of the fuel operation is a testament to the advantages of using TRICONs to manage a unit's equipment.

Needed Improvement

The containers acquired by the 110th do not have lifting points on the front. Therefore, it is difficult to maneuver containers that are placed side by side, which is done often because the containers are connected side to side. The containers should be manufactured with lifting points on the front to improve their ease of use.

TRICONs offer a great advantage to units that have equipment with many small components and that need to move containers often using organic assets. For the 110th, the TRICONs meet those needs. Upon redeploying, the company will keep its equipment in the TRICONs, improve the packing plans, and be ready to deploy again. **ALOG**

First Lieutenant Nathan D. Williams is the petroleum operations officer of the 110th Quartermaster Company at Hunter Army Airfield, Georgia. He has a bachelor's degree from Black Hills State University in South Dakota and is a graduate of the Quartermaster Officer Basic Course and the Mortuary Affairs Course.

Iraqi Freedom—One Year Later

This issue of *Army Logistician* coincides with the first anniversary of the beginning of Operation Iraqi Freedom on 20 March 2003. Following the overwhelming success of coalition offensive operations, which swept past Iraqi forces, captured Baghdad, and ended the regime of Saddam Hussein in less than a month, Iraqi Freedom entered a lengthy phase of post-hostility operations that continues today.

To oversee this new phase, Coalition Joint Task Force 7 (CJTF–7) replaced the Coalition Forces Land Component Command in June. CJTF–7 assumed operational control of all U.S. land forces in Iraq, as well as those of coalition partners. The U.S. forces under CJTF–7 are engaged in operations designed to root out the last vestiges of resistance by the old regime. In December, their efforts produced a nice Christmas present for the American and Iraqi peoples in the capture of Saddam Hussein himself. At the same time, U.S. service members, Department of Defense civilians, and civilian contractors are working, in many cases with Iraqi nationals, on numerous projects to stabilize and rebuild Iraq and provide humanitarian support to the Iraqi people.

As we commemorate the passing of a year since coalition forces stormed into Iraq on their way to a decisive battlefield victory, *Army Logistician* presents this collection of images as a reminder of the often overlooked and underappreciated work Army sustainers continue to do on a daily basis to help win the peace.

ALOG

Soldiers of the 642d Engineer Company from Fort Drum, New York, and the 864th Engineer Company from Fort Lewis, Washington, help distribute food to Iraqis at the 48th Warehouse Distribution Center in Al Judajayl. The food was provided by the Logistics Support Area Anaconda dining facilities.

An Iraqi child receives an oral polio vaccine at a temporary Army medical facility in the northern city of Byhassan.

Local construction contractors, under the supervision of the 101st Airborne Division (Air Assault), from Fort Campbell, Kentucky, recover a destroyed Iraqi tank from a ditch. The tank will be transported to the ammunition supply point, where it will be inventoried and destroyed.

A C–5 Galaxy transport sits on the ramp at Balad Air Base in Iraq. The airfield was certified to receive the C–5 and the 270,000 pounds of cargo it carries. Use of the airfield reduces dependence on ground vehicle convoys to transport supplies.

A soldier from the 1st Brigade Combat Team, 4th Infantry Division (Mechanized), at Fort Hood, Texas, lifts the Styrofoam lid covering the hole in which former Iraqi President Saddam Hussein was found hiding on 13 December.

Soldiers from the 16th Quartermaster Company (Field Services), 240th Quartermaster Battalion, at Fort Lee, Virginia, work in a mobile laundry advance system in Iraq, where they sort, bag, wash, and tag over 500 bundles of laundry a day in support of Operation Iraqi Freedom.

A soldier grieves at a memorial service for two fellow soldiers from the 3d Brigade Combat Team, 4th Infantry Division (Mechanized), at Fort Hood, Texas, who were killed in a mortar attack in Samarra, Iraq.

A supply sergeant with Headquarters and Headquarters Company, Coalition Joint Task Force 7, unloads supplies at the task force headquarters in Baghdad.

Base Closure Planning

by Lieutenant Colonel Leslie J. Pierce

An aerial view of Fort Ord, near Monterey, California, which was closed as recommended by the 1991 Base Realignment and Closure Commission.

In the early to mid-1990's, the Army experienced a huge drawdown of soldiers and installations throughout Europe. At most of the affected installations, tenant units were either moved en masse or disbanded when their soldiers departed on permanent changes of station (PCSs). Many tenant units turned over their installation and soldier support responsibilities to civilian employees, the local national workforce, or sister installations.

During the exodus of the tenant units and their soldiers, many functions ceased to be performed altogether, leaving units and out-processing soldiers to fend for themselves. This cessation of support was the result of poor planning or poor execution of the drawdown's intent. Many of the soldiers and leaders in the installation support functions appeared to be concerned only with getting themselves and their families off of the installation so they would not be left "holding the bag" when everyone else had gone. As a result, the remaining soldiers were left to care for themselves, clear the installation, and conduct the business of base closure. These soldiers often had to deal with a complex bureaucracy or seek assistance from other installations that were attempting to care for their own people with dwindling manpower and resources.

If the Army is serious about taking care of its soldiers and their families, especially during periods of turbulence and change, it must ensure a smooth transition during base closure. The Army should regard base closure as seriously as it regards any other military mission.

Preparation

Like other missions, base closure should be preceded by an operation order (OPORD), a synchronization matrix, and, most importantly, a command post exercise. The OPORD (with whatever title and format the commander chooses) naturally should identify the commander's intent as well as directives outlining the base closure requirements and standards.

The synchronization matrix must tie in all functions of installation and soldier support, such as personnel (adjutant general [AG] and civilian personnel), central issue facility, facility management (including housing), transportation, communications and information management, supply (including the central issue facility), health services, and installation security. Other issues such as environmental compliance requirements also should be addressed. The synchronization matrix also must include the establishment of ad hoc elements as units draw down or depart; these elements will be formed from soldiers who, for PCS or ETS (estimated time of separation) reasons, are left behind to support the base closure mission. Although a timeline directed by higher headquarters certainly will be associated with it, the synchronization matrix should be driven by events. Unit departures and population drawdowns should be coordinated with major events when possible. For example, as installations close, consideration must be given to when the current school year or semester ends to minimize disruption of the education of dependent children.

During the drawdown in Germany, I realized that, had a rehearsal or a command post exercise (CPX) been performed before the actual drawdown, many of the problems we experienced would have surfaced, and we could have addressed the problems and implemented solutions for them. The CPX should be designed to test the base closure plan and allow time for OPORD rewrites, identify key positions and personnel (by name when possible), and stress the proper timing of critical events. If time allows, two CPXs could be held. The first should refine the initial OPORD and synchronization matrix and involve the key staff elements of each installation support activity. The second CPX should test the final plan and include all key personnel and their staffs as appropriate. An important goal of the second CPX is to let the subordinate staffs walk through their primary and secondary requirements, determine shortfalls, and test appropriate solutions.

Personnel

The command and control functions for base closure should be identified, and, if needed, a command and control unit or base closure force should be

formed under the direction of the installation commander. Because of the ongoing missions of tenant units, some soldiers and civilian employees identified for base closure duties may have to transfer to the base closure force after their responsibilities in their parent units are handed off to others. As a control function, a modified stop-loss program must be considered so the PCS of soldiers directly or indirectly associated with the base closure can be compared to the events on the synchronization matrix, thus ensuring that the departure of the soldiers does not adversely affect the closure mission.

The installation AG and the Army Human Resources Command must carefully balance the drawdown mission against the assignment of the soldiers. During the drawdown in Germany, too many soldiers and key leaders coordinated with sympathetic Total Army Personnel Command (now Army Human Resources Command) career managers to obtain specific report dates to a gaining installation or a needed school in order to leave the installation (and their responsibilities) early. To those left behind, these actions drew a fine line between career enhancement and opportunism. During base closure, units and the installation AG must coordinate, control, and enforce soldiers' "depart not earlier than" dates.

Installation out-processing procedures for soldiers should be made as simple as possible. For example, the Internet and Intranet should be used whenever possible instead of wasting valuable soldier man-hours just to obtain a rubber stamp on an out-processing checklist. Soldiers could be pre-cleared at the unit level to ensure command participation in those areas that involve money or potential Uniform Code of Military Justice action.

The civilian personnel office also should be included in the planning process. With advance coordination, civilian employees could be transferred to other offices to assist with the closure mission. The employment contracts of civilian and local national employees of installations outside of the continental United States should be coordinated so their jobs are ended or transferred in synchronization with the base closure plan. Incentives can be used to keep civilian employees at work until their duties and responsibilities are completed.

> If the Army is serious about taking care of its soldiers and their families, especially during periods of turbulence and change, it must ensure a smooth transition during base closure.

Central Issue Facility

To reduce the closure and transfer requirements of the central issue facility and ease the strain on the supply office at the gaining installations, soldiers could take their clothing and individual items listed in Common Table of Allowances (CTA) 50–900 with them when they PCS to their next installation. The clothing records, which are needed to maintain accountability, could be taken by the soldiers or sent electronically to the gaining installations. The closing units would have to validate the records and, if necessary, oversee the repayment process through cash collection vouchers or adjustment documents. The soldiers would deliver the validation documents to their new units and installations on arrival. CTA 50–900 issue items could be shipped to the next duty station as unaccompanied baggage or moved with the soldiers themselves as appropriate.

Soldiers selected for the base closure mission most likely will require noncommissioned officer evaluation reports and officer evaluation reports when they out-process. These soldiers should be given their end-of-tour awards before leaving their current units. The base closure mission can be viewed as a deployment and therefore a specific opportunity to excel. Soldiers can receive achievement awards and, if required by regulation, evaluations for their performance during the base closure.

Facility Management and Housing

The process of timing and coordinating the closing of buildings can be emotional and complicated. As soon as their office functions cease, unit facilities should be cleaned, secured, and turned over to the facility management office. Installation housing is, of course, more difficult to manage. A soldier's family could be allowed to stay in quarters until his PCS date, or the family could be allowed to depart the installation for the next duty station ahead of the soldier. If the family chooses to depart first, the soldier should be allowed time to escort his family to the next duty station, obtain appropriate housing, and return to the closing installation to fulfill the base closure mission. For this to work, the gaining installations should agree to put these soldiers at the top of the housing list.

Soldiers returning to complete the base closure mission could be housed together in barracks designated specifically for closure personnel. If this requires the

soldiers to move more than once from their current barracks, they should be given a movement plan with approximate dates of transfer. Without a well-thought-out and well-publicized plan, the morale of the soldiers on the base closure team will quickly wane.

Transportation

Transportation requirements for supplies, vehicles, and household goods must be coordinated early enough to determine if local resources are sufficient to handle the volume. The transportation officer should coordinate with the central issue facility and with each unit to determine how much of the equipment to be moved requires secure transportation. Examples include weapons, communications equipment, computers, and classified documents.

Units that plan to depart en masse and take their vehicles and equipment with them to their new duty stations should be given an opportunity to send their vehicles to a maneuver area training equipment site or corps-level maintenance facility for upper-level maintenance or modifications, if required. Once the appropriate maintenance is performed, the vehicles then could be sent on to the gaining installation. This plan would eliminate the need for coordinating not only the move of the vehicles to a new installation but also the maintenance needed to bring them up to 10/20 standards.

Communications and Information Management

Consideration must be given to security of communications equipment and transmitted information. Networks should remain operational as long as possible to facilitate normal communication to the very last day. As buildings are closed, Internet and telephone jacks should be shut off to prohibit their unauthorized use.

Supplies and Equipment

Some supplies and equipment will, of course, remain with the units conducting the closure. For example, these units must have access to automation and communications equipment until they depart or the base is actually closed. All other items can be transferred with the units as they depart, or they can be turned in to the installation property book office.

Health Services

Health service support should include not only the obvious medical and dental care but also veterinary care and preventive medicine. Medical and dental treatment facilities and missions should be drawn down to match the size of the installation population. Patient care and evacuation could be coordinated with off-post healthcare facilities or moved to a sister installation if the receiving hospitals or clinics have sufficient staffing, finances, and other resources to handle the new patients.

Before any significant drawdown or transfer of responsibility, the medical community must work diligently with the units and soldiers to complete required physicals, immunizations, and dental work for all remaining soldiers. Specific attention should be given to any known unique pharmaceutical requirements so the needs of the base closure personnel can be met without interrupting the supply of required prescription medicines. The obvious goals here are to minimize the disruption of healthcare for the population being served and to advertise the changes in healthcare that are being made.

Installation Security

Installation security should be a key concern since pillagers, vagrants, and squatters may attempt to take advantage of vacant facilities. To minimize vandalism and loss of equipment, installation security should be reinforced with additional military manpower and contract, local, or Federal law enforcement as appropriate.

Environment

Inspections should be conducted early on to identify any environmental cleanup or restoration work needed and to determine what work the soldiers can do and what must be contracted out. Units should include environmental work in their areas in their synchronization matrices and arrange for contract work to start as soon as possible.

The goal of base closure is to move all of the affected units, soldiers, families, and equipment to other installations while properly accounting for everything and everyone. Success will be determined by how well communication, coordination, synchronization, rehearsals, and execution are conducted in support of the mission. If commanders are willing to keep participating soldiers informed and assigned to worthwhile tasks, the base closure mission can be one of the most important and worthwhile missions they will ever perform. **ALOG**

Lieutenant Colonel Leslie J. (Chip) Pierce is the Deputy Chief of Staff for Personnel at the 18th Medical Command in Yongsan, Korea. During the drawdown in Europe, he was the Chief of the Personnel Actions Branch for the 7th Medical Command in Heidelberg, Germany. He has a master's degree in human resources management and is a graduate of the Army Command and General Staff College.

The New Zealand Defence Force—How Does It Stack Up?

BY SQUADRON LEADER LEANNE J. WOON, ROYAL NEW ZEALAND AIR FORCE

As the New Zealand Defence Force (NZDF) moves forward in the 21st century, it continuously looks for new ways to deliver logistics support that will enable it to keep pace with advancing technology and a faster, more complex operating tempo. In the face of personnel cuts and decreased funding, the old adage, "doing more with less," has become the norm. A lack of resources, coupled with the need to achieve the correct balance between the "tooth" and "tail," have led to radical changes in the way the NZDF conducts its logistics business.

The U.S. Army is experiencing similar logistics support challenges, although on a larger scale. Supporting the Future Force will require a major change in the way logistics is delivered to the soldier. Transformation of U.S. Army logistics began 5 years ago with the "Revolution in Military Logistics (RML)," which provided a clear vision of the logistics changes required. Perhaps coincidentally, many of the core concepts of the RML parallel the logistics changes that have been implemented by the NZDF. How do the NZDF's logistics initiatives compare with those of the U.S. Army?

How Has NZDF Logistics Changed?

In an attempt to find ways to enhance efficiency and effectiveness, the NZDF began an initiative called "Rationalization Reviews" in 1995. Policy guidance for the reviews covered a range of areas, including support functions and services. The objectives of those reviews were to—

- Retain core military activities.
- Achieve an appropriate balance of resources between the NZDF's "tooth" and "tail."
- Identify service agency (Army, Navy, and Air Force) options for conducting core activities.
- Identify options for turning noncore activities over to civilian employees or contractors.

As a result of the Rationalization Reviews, the NZDF logistics organization has made significant changes. Perhaps the biggest change has been the progressive outsourcing of noncore logistics functions.

Why Outsource?

The U.S. Army began outsourcing logistics support during the Revolutionary War (1775–1783). The Civil War (1861–1865) increased the use of contract logistics to supplement the armies' transportation and subsistence capabilities. This practice continued into the present, with Operations Desert Storm and Iraqi Freedom providing the most recent examples of extensive outsourcing for logistics support. Contractors are now an integral part of the wider Department of Defense workforce that delivers combat support to the U.S. Army on the battlefield.

Outsourcing is a term that is frequently used but often misunderstood. Before looking at the NZDF activities that have been outsourced, it is important to define the term. The Business Executives for National Security organization defines outsourcing as "contracting out for certain services and support formerly accomplished with internal resources." Outsourced providers often are referred to as contractors or third parties. When outsourced work is subcontracted, the outsourcing business still provides oversight and adds value to the customer's supply chain.

A RNZAF C–130 Hercules transporter sits on an icy runway in Antarctica. Since 1956, the NZDF has transported personnel, logistics support equipment, and scientific freight to Antarctica to support annual operations.

In an effort to embrace the best business practices, the NZDF has adopted outsourcing as a key tool in its battle to reduce the cost of military logistics functions. The primary objective of outsourcing logistics functions is to obtain better value for the funds expended. According to the Outsourcing Institute, 85 percent of companies now outsource work previously done in-house. The challenge for today's defense forces is first identifying core logistics functions and then outsourcing those that are noncore.

In the NZDF, contracts are awarded for noncore logistics functions and are managed strategically across the defense force. Within each military service, outsourcing is used primarily for depot-level maintenance activities. The New Zealand Government has credited these programs with saving approximately $115 million over their first 2 years. With a defense budget of $677 million, this represents an annual saving of about 8.5 percent of total spending.

What is the NZDF Outsourcing Strategy?

Because of an increasing operational tempo and a shortage of both financial and personnel resources, the NZDF is seeking to return to its core competencies. Effective logistics outsourcing will enable defense forces to focus on their core competencies while releasing personnel to focus on what they do best—warfighting.

Most logistics functions performed in the military also are conducted in the commercial sector; thus, they are viable candidates for outsourcing. Outsourcing of noncore competencies is based on the notion that an organization seldom can excel at more than a handful of activities and, to achieve maximum efficiency, it should focus on those activities. The defense organization is no exception.

For the military, identifying warfighting capabilities as a core competency is relatively easy. The difficulty lies in identifying the logistics services that should be retained as core military competencies. The NZDF defined core and nonoperational (or noncore) logistics functions in the Chief of Defence Force 1998 Policy on Manpower Required in Uniform. Core activities are those that would be undertaken by the NZDF inside an area of operations. Nonoperational activities are those activities associated with training and support that do not require military skills, are generally commercial or administrative in nature, and are not directly related to operational activity. Drawing from these definitions, noncore logistics functions can be described as nonoperational activities that are not required to be undertaken by military personnel.

What Has NZDF Outsourced?

Although the New Zealand Army, Royal New Zealand Navy, and Royal New Zealand Air Force have begun their own outsourcing initiatives, this article deals only with the logistics functions outsourced by the NZDF Logistic Development Directorate. This directorate, along with the Ministry of Defence Procurement Directorate and the NZDF Strategic Plans Directorate, performs strategic logistics with the assistance of other New Zealand and international organizations and agencies.

The three main drivers of an effective logistics system are technology, processes, and people. The first—technology—is the key enabler to any logistics system. Therefore, it is not surprising that the NZDF's outsourcing initiatives have concentrated on technology in the following areas.

Supply and finance. In 1994, the NZDF initiated Project Fusion, which was the implementation of SAP Enterprise Resource Planning system supply and finance software modules across the NZDF. This was an ambitious project to replace legacy customer-developed systems with a single commercial off-the-shelf system that would bring the NZDF into the 21st century. NZDF supply and finance services had been provided in-house previously, so purchasing the SAP system was a revolutionary change. SAP required a radical change in the way the NZDF conducted business, because NZDF processes had to be changed to fit the SAP solutions.

Through the use of the enabling SAP technology, the NZDF has adopted the best business practices for logistics management, thus improving the entire NZDF business process. The implementation of SAP in 1998, combined with an improved information technology (IT) environment, provided a robust platform for further supply chain initiatives. The NZDF saved $3.06 million in the first year that the SAP system was used, surpassing the original estimate by 22 percent. This figure does not include an additional saving of $700,000 in personnel costs.

Reprographic equipment and multifunctional devices. The upgraded IT environment required to implement the SAP technology provided an opportunity for the NZDF to outsource the purchase or lease of reprographic equipment and multifunctional devices. Previously, each service arranged for the purchase or lease of its own reprographic equipment. The introduction of digital technology and multifunctional devices into the performance of this function has enabled the NZDF to realize a significant cost saving. The contract, signed in 1999 for 5 years, has saved at least $1 million a year through reductions in staff and lower costs for photocopying and printing. Equipment previously owned by the NZDF has not been replaced, making substantial capital resources available for other purposes.

Office products and stationery. A contract signed in 2000 eliminated the need for stationery stores in the NZDF by providing personnel the capability to order items electronically. Supplies are delivered directly from the vendor to the customer within 48 hours.

Uniforms and other apparel. In 2001, the management, development, and manufacture of NZDF clothing were outsourced to a prime vendor contractor. The contractor procures, manages, warehouses, and distributes apparel, footwear, and personal support items used by NZDF service personnel. The contractor's IT system is linked to the NZDF SAP system, which enables NZDF personnel to order on line. All orders, invoices, and payments are managed electronically. The contractor, Yakka Apparel Solutions, won a 2001 New Zealand Logistics Excellence Award for its NZDF contract. By outsourcing this function, the NZDF realized an initial saving of $3 million with the closure of the defense uniform stores.

Consumables. In September 2002, the NZDF signed a contract with a prime vendor to deliver consumable items directly to the customer. Consumable items are defined as nonspecific military materials purchased to meet both nonstock and stock requirements. Each year, the NZDF buys approximately 50,000 consumable items with a purchase value exceeding $20 million from more than 1,700 suppliers using contracts, standing offers, and casual purchase agreements. The reductions in personnel and inventories resulting from contracting with a prime vendor for consumable items and the attendant use of electronic procurement will accrue significant savings for the NZDF.

The use of the SAP technology has enabled the NZDF to apply the best business practices to logistics processes while modernizing its IT delivery platform. With information from SAP, the NZDF supply chain initiatives identified noncore areas of logistics that were candidates for outsourcing.

Although the benefits of outsourcing noncore logistics functions may appear obvious, the changes required to adopt the best business practices and outsource functions previously performed by the military should not be underestimated. All of the contracts required a radical shift in the way business was conducted, as well as active change management to bring commanders and support personnel on board. The NZDF adopted a deliberate strategy of first getting the IT platform right, then progressively working through the "low-hanging fruit" logistics areas to ensure that the change strategy and implementation were managed appropriately. Obviously, the small size of the NZDF—10,000 personnel—and the fewer functions it performs permitted a degree of flexibility and responsiveness that is more difficult to achieve in an organization the size of the U.S. military.

The NZDF has managed to achieve savings and gradually restore the balance of resources between the NZDF's "tooth" and "tail" through an aggressive strategy of forcing change from the top down into the services' logistics chains. How does this strategy compare to that of a major defense force, and is the NZDF on the right track? Do the changes implemented by the NZDF parallel the concepts embraced by the U.S. Army?

How Do the NZDF and U.S. Army Compare?

The RML included six tenets on how the Army will be supported in the future: Seamless logistics systems, distribution-based logistics, agile infrastructure, total asset visibility, rapid force projection, and adequate logistics footprint. Those tenets are inherent in the current transformation of U.S. Army logistics. To meet the operational requirements of the future, a revolutionary change in the delivery of logistics is required. Thus, a logistics transformation that includes "looking outside the box" to commercial industry and identifying the practices that enable companies to remain competitive is needed.

Two of the RML tenets that are intrinsic in the U.S. Army's logistics transformation have been embraced fully by the NZDF: the adoption of seamless logistics systems and the implementation of agile logistics infrastructures.

Seamless logistics systems. The U.S. Army has myriad Army-specific logistics systems that operate at different levels of support. The seamless logistics concept is focused on a single, integrated, enterprise-wide information system. Any new information system must operate within the entire military environment, including other defense agencies. It also must have connectivity with the commercial sector so contractors can support the deployed Army.

Achieving a seamless logistics system will require massive organizational and business process changes within the Army. It will mean a new way of thinking and conducting business for the Army logistics chain, including the adoption of best business practices. Some of the best business practices include outsourcing logistics functions, partnering with world-class providers, implementing direct vendor delivery, and using electronic commerce. All of these practices are applicable to the Future Force and depend on an integrated information system that provides total, real-time asset and activity visibility.

Within the NZDF context, the seamless logistics system concept has been implemented through the introduction of the SAP system across all three services, which has required organizational and business changes both within the NZDF and among external suppliers.

Agile infrastructure. A common theme of Joint Vision 2010, the Quadrennial Defense Review, and the National Defense Panel is that defense needs an agile infrastructure that is flexible and can adapt to rapid changes from peacetime to wartime. Many themes recur in these documents. Key among them are competitive outsourcing and prime vendor support. The agile infrastructure is designed to improve combat capability by reducing the mobility and logistics footprints. These logistics concepts directly impact the force's ability to execute combat operations.

During Operations Desert Shield and Desert Storm, the more than 3,000 contractor personnel deployed to perform functions such as weapon system maintenance were an integral part of military operations. The U.S. Army's Logistics Civil Augmentation Program (LOGCAP) formalized the contingency contracting support required for logistics in theater and is now an integral part of the force. Outsourcing for contingency support services is a flexible and effective way to provide logistics support to forces and is conducive to partnering with a prime vendor. According to U.S. Army Field Manual 100–10–2, Contracting Support on the Battlefield, "Contingency contracting can be an effective force multiplier for deployed forces by providing supplies, services, and construction support to augment their intrinsic capabilities."

The agile infrastructure concept has been employed extensively in the NZDF. Outsourcing of noncore logistics functions is now commonplace. Based on the best business practices, selected prime vendors provide consolidated logistics support to the NZDF. Through partner sharing practices and extensive use of technology, the NZDF also has streamlined and expedited delivery of services to the operational users.

However, with the modernization of force firepower and the proliferation of technology on the battlefield, the NZDF may need to adopt contingency contract concepts similar to those used by the U.S. Army to support its forces in theater. This ultimately may require the NZDF to reexamine its current definition of noncore functions.

Contractors now play a vital role in delivering logistics support on the battlefield and are indeed force multipliers for the U.S. Army. Despite the difference in size between the U.S. Army and the NZDF, there are definite parallels in the NZDF's logistics direction and the U.S. Army's strategy for logistics transformation. The NZDF's small size permits flexibility and responsiveness that allow it to implement change progressively across the three services on a scale that would be infinitely more difficult to accomplish in a large and complex organization such as the U.S. Army.

A comparison of the NZDF's logistics strategy with the U.S. Army's logistics transformation indicates that the NZDF is indeed on track to deliver logistics in the 21st century. However, the NZDF cannot afford to be complacent and must continue to seek to modernize and, where necessary, revolutionize logistics functions, processes, and delivery methods to ensure effective logistics support of its military forces. The U.S. Army's logistics transformation provides a sound logistics strategy for NZDF to emulate in the future. **ALOG**

A United Nations helicopter that is owned and operated by the RNZAF lands in East Timor. Between June 1999 and January 2003, more than 6,000 NZDF personnel served in East Timor as part of a multinational peacekeeping force.

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COMMENTARY

The 'Short List' for Achieving a Logistics Revolution

BY COLONEL LARRY D. HARMAN, USA (RET.)

The intent of this article is to present a "short list" of changes, or reforms, that I believe will ignite a real revolution in U.S. military logistics transformation. Stated somewhat differently, there are three changes that will force a fundamental and irreversible shift in the provisioning of our future forces. These three revolutionary changes are—

- Creating a single, national-level project-and-sustain command.
- Attaining unprecedented speed in operations.
- Achieving overwhelming force protection.

Other required changes will combine with the three on the short list to foster a comprehensive rebalancing of end-to-end force projection and sustainment. I believe that the short list can be implemented in the 2008 to 2018 timeframe.

The short list is not focused solely on the individual armed services and the regional combatant commands. It also is aimed at the decisionmaking processes of any potential adversary who might be considering military action against the United States or one of its allies or friends. An adversary's senior decisionmakers must understand that the United States can and will project and employ its combat forces with great speed, precision, audacity, lethality, and sustainability. This understanding should dissuade the competent, as well as the incompetent, enemy from confronting the United States militarily. If dissuasion fails, the enemy will be subjected to the full might of the Armed Forces of the United States.

Cultural clashes undoubtedly will occur within the U.S. military establishment as these three changes are debated. The good news is that each potential change will go through experimentation and prototyping before it is fully implemented. Let me elaborate on why the revolutionary transformation changes I suggest are required and then discuss each of the three changes that make up the short list in more detail.

High Stakes

Department of Defense (DOD) transformation will affect the entire U.S. military. As one might surmise, the eventual outcomes of this deliberate transformation are unknown, but one thing is quite clear: The military element of U.S. national power will remain, and must remain, second to none in the world. In its quest for persistent military superiority, the United States will vigorously pursue overmatching and asymmetric advantages over any potential or actual threat or combination of threats.

Future threats will run the gamut: near-peer and nonpeer adversaries; state and nonstate actors; competent regional competitors; conventional and unconventional, symmetric and asymmetric, cyber, informational, and space threats; weapons of mass effects and destruction; and transnational terrorism. Anti-access and area denial strategies also will create challenges for our forces when they deploy into a theater. Obviously, the stakes are high. Our way of life, standard of living, and international prestige are all targets. These are facts, not exaggerated conjecture.

A Project-and-Sustain Revolution

To either preempt or respond to a single threat or a combination of threats, our future military forces, regardless of service, location, or mission, will be projected and sustained quite differently than they are today. In the future, a force with overmatching "speed" in every domain will win; conversely, a force that is slow to "sense, understand, decide, and act" will lose. The chaotic and unpredictable 21st century operational environment, accompanied by technological innovations, intelligent and determined adversaries, and the anticipated broad range of U.S. military missions, demands a coherent force projection and sustainment revolution that exploits knowledge, speed, technology, and wise decisionmaking.

Greater Than Joint

The 21st century force projection and sustainment revolution also must be greater than joint. By this, I mean that the individual services should not come together only on a temporary basis to accomplish a mission; the U.S. military must have some standing joint organizations. These new organizations must perform deployment, operational, sustainment, and command and control missions in a more coherent manner that eliminates harmful gaps or seams in missions; gross inefficiencies; operational mismatches; unnecessary delays in entry operations; and poor situational awareness and understanding. Other Federal agencies, nongovernmental and private volunteer organizations, contractors, and coalition military forces will join with the U.S. military to achieve operational and strategic goals.

Of course, significant evolutionary progress has

This article expresses the views of the author, not the Department of Defense or any of its agencies.

been made in the last decade. A culture of service, interagency, industrial, and multinational cooperation is emerging. Old counterproductive barriers, such as "we versus they" mindsets and service parochialism, are eroding as new cooperative thinking and decisionmaking take hold and service interdependencies begin to evolve. A new balance among the services, Federal agencies, allies, and industry is creating synergistic opportunities for maximizing effectiveness.

The "Short List"

I believe that DOD-wide transformation will require literally thousands of significant changes, but only a small percentage of them have truly revolutionary potential. I came to this belief after digesting a wealth of Army, Marine Corps, Navy, Air Force, joint, and Office of the Secretary of Defense publications; other professional writings and futuristic concepts; and lessons learned.

Just within the force projection and sustainment domains, hundreds of changes are required. However, I believe that the three required changes of the short list are of such great importance that, without their implementation, the entire DOD transformation effort will fall short of expectations.

Creating a Single Project-and-Sustain Command

The United States requires one national-level command that is responsible for projecting and sustaining its military forces. To put this another way, a requirement exists for one deployment, sustainment, and distribution process owner who is a commander and not just a staff principal.

This unifying command would be vital to transformation. Based on strategic and theater priorities, the command would project required military capabilities to mission areas worldwide. Then, from a strategic perspective, it would keep those capabilities mission ready. Some critics may argue that such a command would result in over-centralization; in reality, the advantages of decentralized execution would not be discarded. The intent would be to create a much higher degree of strategic and theater agility and flexibility than has been experienced before. Without question, legislative changes to Title 10 of the U.S. Code would be required to achieve this agility and flexibility.

The new project-and-sustain command would be responsive to the President, the Office of the Secretary of Defense, the Chairman of the Joint Chiefs of Staff, the regional combatant commands, and the unified functional commands. At the strategic level, it would promote a worldwide "sense, understand, decide, and act" cycle, with the emphasis on "acting." It would contribute to the emerging deployment-employment-sustainment warfighting continuum that acknowledges a distinct blurring among the levels of war, force projection, force employment, and force sustainment. This command also would be instrumental in achieving a transformed, national-level force reconstitution, redeployment, and demobilization continuum.

We simply cannot separate excitement and anxiety from change.

—Major General James M. Dubik, USA
Director of Joint Experimentation, J–9
U.S. Joint Forces Command

The command would exploit network-centric command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR) capabilities in order to gain shared situational awareness and understanding in the deployment, operational, and sustainment domains. It also would be better able to manage the problems created by high demand for low-density capabilities that plague the military today.

An effective organizational structure, accompanied by appropriate organizational behavior, is important. The command should reap the benefits of structural synergies. This national-level project-and-sustain command and its subordinate commands would be built initially from the existing U.S. Transportation Command and Defense Logistics Agency and from portions of the services' logistics and support structures. For example, the Army's Logistics Civil Augmentation Program and its Navy and Air Force equivalents would become part of this national-level command. The new command would be engaged in the worldwide pre-positioning of equipment and sustainment supplies, whether ashore or afloat. New types of specialized, subordinate multiservice organizations may evolve to work alongside units from the individual services.

Some of the force projection and sustainment capabilities now assigned to service component commands in each of the regional combatant commands could migrate to this national-level command. The reasons for this realignment can be found in trends in DOD toward—

- Defining joint and service core competencies and eliminating unnecessary redundancies.
- Unifying disparate deployment and sustainment capabilities.
- Fostering commonality in equipment.
- Compressing deployment timelines.
- Developing capabilities to change the conduct of operations rapidly and to deal with various worldwide threats simultaneously.

• Adopting emerging research, development, test, and evaluation processes and new acquisition strategies.
• Emphasizing distribution-based logistics.
• Establishing standing joint forces.

Of course, creation of the project-and-sustain command would require resolution of many secondary matters, such as budget authority; affordability; span of command and control; unity of command; service roles and missions; degree of centralization; generation of doctrine, organization, training, materiel, leadership and education, personnel, and facility (DOTMLPF) requirements; compatibility of information systems; metrics for assessing effectiveness; and Reserve components transformation.

Attaining Unprecedented Speed

The United States must achieve unprecedented speed in military operations, as well as in nonmilitary activities that support the achievement of both military and political objectives. Force projection and sustainment are no exceptions. The speed of future strategic and operational maneuver will be determined by the speed of deployment. The speed at which sustainment flows forward and rearward must exceed the speed of maneuver. New readiness models and the requirements generation process must reflect the need for speed. Both materiel and nonmateriel solutions must be sought.

The U.S. military needs a new mindset that calls for the speed of sustainment replenishment to increase, not slow down, as shipments and other types of support approach the combat zone and supported units. The speed of retrograding sustainment also must improve dramatically. In the future, ever-increasing speed will not be a luxury afforded only to the highest priority needs. A DOD-wide cultural leap in sustainment and distribution speed and precision will be mandatory if radically improved time-definite delivery (TDD) and customer wait time (CWT) standards are to be achieved. The term "sustainment and distribution elasticity" also must be embraced as a measure of effectiveness. Unprecedented high speeds will enable sustainment operations to transform into more viable "maneuver sustainment" operations.

Speed must be applied in three domains: cognitive, information, and physical. Within the cognitive domain, speed of command will be imperative. Rapid identification of alternatives and options will assist leaders greatly. Decisionmaking speed, enhanced by decision support aids, modeling, and simulations, should be accessible down to the lowest levels of leadership. Knowledge management will be imperative, and innovative thinking will be critical.

Within the information domain, speedy and disciplined access to information will help leaders gain and maintain information superiority. A collaborative information environment will promote rapid sharing of information, thereby providing shared situational understanding throughout the force. Sensors and sensor range will be exploited; a sense-and-respond maneuver sustainment concept will encourage speed in sustainment; and futuristic "information cockpits" will expand computer-human interfaces. To maintain the power that comes from knowledge, a central information repository with backup networks will evolve and reach-back capabilities for obtaining information will mature. Of course, developing speed in the information domain will depend on transformational communications technology featuring expanded bandwidth, network-centric activities, horizontal integration, persistent surveillance, and predictive analysis. All of these will lead to a viable, logistics-oriented common operational picture.

To increase speed within the physical domain, a ubiquitous sense-and-respond maneuver sustainment system must replace focused logistics and supply chain management. This will require sophisticated sensor, information, and communications networks.

An alternative to the DOD Uniform Material Movement and Issue Priority System (UMMIPS) also is required. A future UMMIPS alternative could allow for only four priorities: priority 1 (war or contingency, urgent); priority 2 (war or contingency, pulsed); priority 3 (mission critical or not mission capable, pulsed); and priority 4 (routine, pulsed).

New families of aerial platforms (manned and unmanned) and shallow-draft, high-speed sealift vessels could facilitate rapid distribution among commercial vendors, continental United States (CONUS) depots and distribution centers, pre-positioned sustainment locations (both ashore and afloat), theater-level sources of supply, and requesting activities. Most, if not all, sustaining units could have organic aerial vehicles, just as units today are authorized trucks.

High-speed maneuver sustainment distribution is a nonnegotiable requirement for speed in the physical domain. The new distribution system should resemble simultaneous sprint relays, where "baton passes" (the distribution nodes) are few in number and quick in execution, all segments of the "race" (the distribution pipeline) are run "hell bent" for the finish line (the supported unit or weapon system), and the weight of the "batons" (the transportation modes) is less than that of current versions. "Smaller, lighter, and faster" should be force projection and maneuver sustainment virtues. Essentially, the United States must dramatically improve its combat power per ton ratio.

Some sustaining organizations could self-deploy. Distribution capabilities that are seemingly unimaginable by today's thinking could replace current technologies. New containerization, packaging, and materials-handling developments will promote speed. The U.S. military should no longer rely on contemporary surface means of transport from CONUS to deployed units. Dependence on fixed airfields and improved seaports must decline dramatically, especially for early-entry operations; that will negate in part an adversary's anti-access and area denial strategy. Innovative basing strategies must be exploited. Worldwide flexible land basing, agile forward operating bases, and sea basing must mature to facilitate responsiveness, agility, and sustainability.

Worldwide TDD and CWT standards must be reduced, and those standards must be nonnegotiable. To measure CWT and TDD effectiveness, the requisitioning process may require that future document numbers be expanded to include the exact time (Zulu time) that a request was generated. Minutes will matter in the serious business of maneuver sustainment.

Technological advances must be embedded in the force. For example, sensors with increased range could be used in making diagnostic and prognostic checks of vehicles, weapons platforms, ammunition, and human health. Robotics should be exploited by units when in garrison and when deployed.

New families of aerial vehicles will be required for dedicated maneuver sustainment. These vehicles should be self-deployable and multipurpose; have vertical or super-short take-off and landing capabilities; have a range of at least 800 miles and attain speeds in excess of 300 miles per hour; possess some stealth characteristics; and be easily operated, simple to maintain, and relatively inexpensive when compared to current rotary-wing platforms. Payloads will vary depending on type of aerial vehicle.

If the United States is to deny sanctuary to any adversary and sustain its forces simultaneously, it must accelerate dramatically the speed at which forces task-organize, deploy, and conduct and sustain operations.

Achieving Overwhelming Force Protection

Arguably, a new American way of fighting and winning wars is evolving. Although linear and contiguous military operations may still occur, future operations are more likely to be nonlinear, widely distributed, noncontiguous, simultaneous, and sequential. To add more complexity to the situation, an adversary may have niche parity with the United States in certain destructive capabilities or may even possess some asymmetric advantages it can spring on a U.S.-led force. A shrewd and determined enemy will attack U.S., allied, or coalition targets as opportunities surface. Since sustainment activities are frequently an enemy's targets of choice (a lesson relearned in conflicts of the last decade), we need to change the future enemy's mindset so that he intentionally avoids attacking our maneuver sustainment forces.

To achieve overwhelming force protection, the following issues must be considered—

- The United States may require special joint task forces to secure strategic- and theater-level air and sea lines of communication from CONUS into the joint operations area and combat zone entry points.
- U.S. forces should be trained and equipped to sustain and protect asymmetrically, thereby keeping the enemy guessing and paralyzed. Adversaries must not be able to predict U.S operations.
- Past sustainment protection practices no longer work. Sustainment missions must be treated as combat operations. Sustainment must be mobile in order to survive. Unprecedented speed (cognitive, informational, and physical) will contribute immeasurably to protecting maneuver sustainment units. Situational awareness down to the lowest levels will be mandatory.
- Since fewer stockpiles of sustainment will be part of the future military culture, the security of each shipment will become more critical. Dedicated or organic armed aerial escort with at least a limited capability to suppress enemy air defenses will be essential for maneuver sustainment operations.
- Dedicated or organic air traffic control capabilities will be required for aerial maneuver sustainment operations. Ever-changing aerial sustainment corridors will replace, over time, traditional ground supply routes. Sustainment vehicles and equipment must have greater survivability and protection; for example, there should be no thin-skinned ground vehicles in the combat zone.
- Robotics and various types of protection-related sensors must be exploited. Protection of automated logistics and other C4ISR systems will be imperative.

Simply stated, the time for major reform is now. The U.S. military must rebalance itself to project and sustain future forces in ways previously unimaginable. The three changes identified on the short list are the ones to tackle aggressively.

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COMMENTARY

Water Ferry Services for Homeland Security and National Defense

BY EUGENE C. BONACCI

The rail and highway infrastructures in the United States, especially Interstate 95 and other interstate traffic corridors along the east coast, are becoming increasingly congested. Improvements to rail chokepoints and highway bottlenecks are not economically feasible and, if they were, would take many years to complete. Therefore, it is critical for our Nation to develop a coastwise domestic water ferry capability that can be implemented quickly when needed for homeland security and national defense purposes.

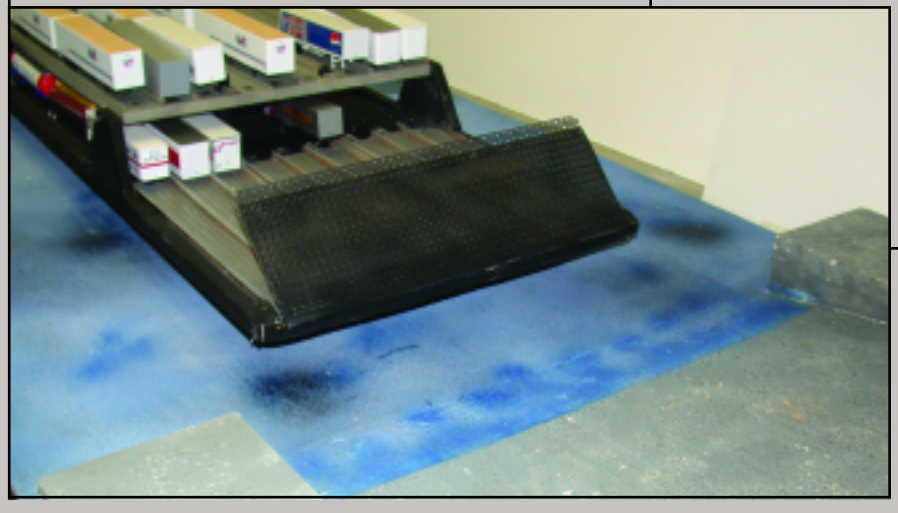
Coastwise domestic water ferry service would offer an immediate, workable alternative if bridges or tunnels along major interstate or other coastal highways or rail networks were compromised, making the routes impassable. Halting or slowing down commerce on these major interstate routes would wreak great harm to our Nation's economy and security. Suitable alternate supply routes are desperately needed now.

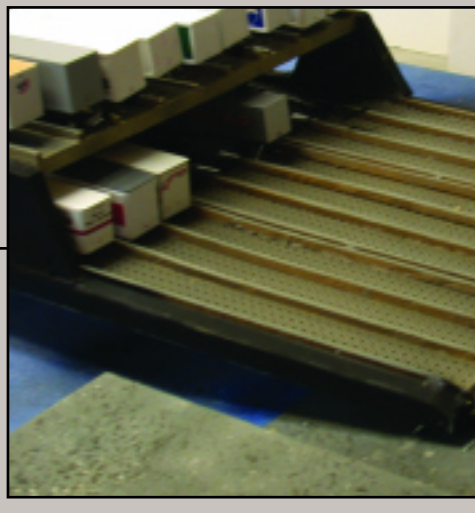
Government officials and others responsible for developing solutions to the increasingly acute highway and rail infrastructure problems should consider coastwise domestic water ferry service as a viable transportation option and provide appropriate funding for its development and implementation.

Controversy exists among water ferry proponents about the use of roll-on-roll-off (RORO) versus lift-on-lift-off (LOLO) service in domestic coastwise operations. LOLO service offers economic benefits because more containers can be moved at a lower cost per container on a single vessel; however, LOLO service requires substantially larger infrastructure capital investments than RORO service by both the origin and destination ports to load and unload the vessels, and the LOLO process takes significantly more time. Because of the additional port terminal time required, LOLO vessels cannot compete with direct, over-the-road trucking operations in providing the fastest delivery service possible to the military services or other customers in the event of a national emergency.

However, transport by RORO vessels can be competitive with direct, over-the-road truck service in certain traffic lanes if an adequate number of vessels are used, their departure and arrival times are scheduled to ensure consistent on-time delivery, and they maintain the proper speed while underway. RORO transport would permit the water ferry service to be competitive during normal operations as well as during a crisis, making it more appealing to domestic shippers and

This series of photos shows a model barge approaching a ramp and offloading its cargo of over-the-road trailers on transfer carriages.





consignees in their everyday business operations.

In a RORO container-on-chassis operation, containers could be discharged from an international containership and loaded immediately onto waiting chassis. The containers on chassis then could be loaded onto specially designed "transfer carriages." These transfer carriages then could be loaded on a coastwise vessel as soon as it arrived, reducing vessel turnaround time. The port terminal operation would be simplified by not having to stack the containers when they are offloaded, relocate them later, and lift them onto the coastwise vessel when it arrives, which would be the case in a LOLO operation.

In a domestic RORO operation, the 53-foot over-the-road trailers with containers permanently attached could be moved onto transfer carriages and loaded immediately onto the coastwise vessel when it arrived at the port. This would reduce vessel turnaround time and simplify loading operations at the origin port terminal.

The 53-foot trailers with attached containers are not conducive to LOLO operations and would be excluded from domestic LOLO coastwise water ferry operations. However, they represent over 95 percent of the current over-the-road truck traffic. Therefore, shippers who use these 53-foot trailers would benefit most from having RORO water ferry service available to provide for continuity of commerce in a national emergency.

When a domestic coastwise vessel arrives at its destination port, the RORO operation would be reversed for unloading. As soon as the transfer carriages were unloaded from the vessel, the delivery truckers could pick up the containers on chassis or 53-foot trailers and deliver them the same day. Using transfer carriages when unloading would reduce the coastal vessel turnaround time and simplify operations at the destination port terminal.

A LOLO operation requires a substantial capital investment in a sophisticated fixed-port infrastructure. By contrast, a RORO operation could be conducted at a remote shallow-draft location with very little capital investment. What's more, a shallow-draft RORO operation, unlike a LOLO operation, could be shifted to another location quickly and easily in an emergency, which is an important benefit of coastwise domestic water ferry service.

RORO domestic water ferry service clearly is a viable solution to the daunting rail and highway infrastructure problems. The funding required to develop and implement these water ferry services is a relatively small fraction of the funding that would be needed to improve the current rail and highway infrastructure. RORO flexibility is crucial to our homeland security and national defense.

The challenge is clear. Government officials and others who are responsible for planning our Nation's transportation architecture should develop and implement RORO coastwise domestic water ferry service without delay. In the interests of homeland security and national defense, our Nation needs this transportation service alternative. And it needs it now.

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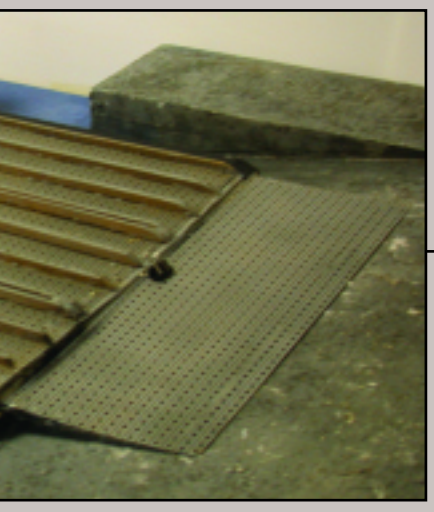
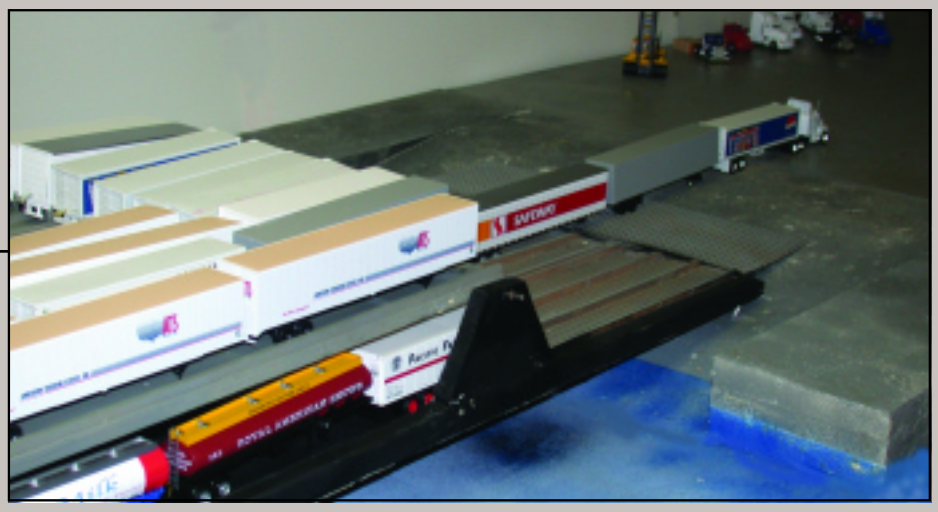




Unmanned Aerial Logistics Vehicles—A Concept Worth Pursuing

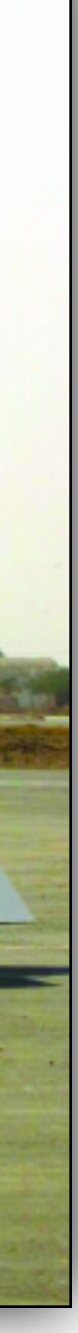
BY MAJOR JOHN V. MCCOY

An RQ1L Predator makes its way back to the hangar at a forward base after flying a reconnaissance mission over Afghanistan during Operation Enduring Freedom.

Military history is rich with scenarios in which ground convoy routes have been interdicted by enemy activity and closed until the threat was cleared. Using unmanned aerial vehicles (UAVs) to make deliveries in such scenarios would allow logistics units to solve the tactical dilemma of providing food, medical supplies, critical parts, or ammunition when the risk to ground logistics assets is high.

UAVs may help to meet logistics needs on future battlefields, yielding the benefits of simplicity, reliability, flexibility, lift capability, interoperability, asset visibility, reduced risk, and lower cost. The benefits of using unmanned resupply aircraft may exceed those of relying on manned ground resupply systems and existing air resupply systems such as C–130, C–17, and C–5 transports and UH–60 and CH–47 helicopters. UAVs have the potential to reduce the risk to human life in combat operations, reduce the logistics footprint in theaters of operations, and improve logistics effectiveness and efficiency.

The types of UAVs that could be used include helicopters, fixed-wing aircraft, and blimps. Each could be used in conjunction with navigation-guided parachute systems. Existing small, unmanned helicopters, airplanes, and blimps have enough cargo capacity to each deliver a cargo of 13 cases of meals, ready to eat (MREs), which together include 156 meals, weigh 221 pounds, and occupy 10.8 cubic feet of space. Unmanned aircraft, such as a blimp, may carry larger payloads up to 160 tons.



Possible UAV Delivery Methods

Four methods could be used with UAVs to deliver supplies—

- UAV loads, takes off, lands, and unloads.
- UAV loads, takes off, airdrops, and returns.
- Heavy-lift blimp loads, takes off, and hovers; smaller UAVs deploy and land.
- Heavy-lift blimp loads, takes off, and hovers: smaller UAVs airdrop and return.

Each method has advantages and disadvantages that must be considered when determining its use.

UAV Loads, Takes Off, Lands, and Unloads

This process involves loading a UAV with supplies at a source takeoff site. The UAV then flies to a landing area near the customer and lands. After being offloaded, the aircraft takes off and returns to its point of origin or another source of supply, perhaps backhauling cargo if necessary. All three types of UAVs have the technology needed to take off, carry cargo, and land at a delivery site.

This process stands out as the simplest UAV delivery method because it involves fewer system components than other possible processes. The process involves only the UAV and the cargo. Its simplicity also creates a minimum logistics footprint; no footprint is required for rigging support, large amounts of cargo, or multiple vehicles. This process also provides commanders with the least complicated scenario for controlling airspace. A single delivery involves only one route of flight for one vehicle, with no requirements to deconflict airspace in order to accommodate multiple vehicles or multiple airdrop loads. The process can deliver less than a truckload without committing a truck's worth of lift. Current ground transport resupply methods require the dispatch of vehicles capable of hauling over a ton, even if the required cargo weighs only 200 pounds.

Because the UAV requires a runway to land, the load, take off, land, and unload process cannot be used in undeveloped areas. The time required to load cargo and identify a suitable destination runway also would make the use of the UAV to quickly fill unforeseen requirements impractical, especially for multicustomer deliveries.

UAV Loads, Takes Off, Airdrops, and Returns

In this process, a UAV is loaded with supplies at a source takeoff site. The aircraft then flies over its customers, airdrops its supplies, and returns empty to the source takeoff site for another mission.

A UAV can conduct an airdrop and return to its airfield of origin. No insurmountable aerodynamic control problems are associated with cargo loads ejected from the aircraft while it is in flight, and it is possible to control the ejection of airdrop cargo from distant ground-based control stations. A lightweight precision airdrop system can guide an airdrop load as small as 200 pounds to within 100 meters of its designated landing location from an aerial release point 20 kilometers away. Cargo aircraft used to discharge multiple lightweight precision airdrop bundles can be equipped with automated takeoff, flight, and landing capabilities.

If you want to succeed you should strike out on new paths rather than travel the worn paths of accepted success.

John D. Rockefeller, Sr.

This process is relatively simple when compared to hover-and-deliver systems with their multiple vehicles and multipart systems, but it is not as simple as the take-off-and-land process. The take-off-and-airdrop process involves a relatively reduced footprint. Space for rigging and maintenance is all that is required in addition to the UAV. No additional space is needed to support multiple aircraft or multiple airdrop rigging systems.

For an unforeseen requirement, all that is needed to execute this process is the rigging and loading of the cargo. The process has the advantage of being able to make deliveries when no landing area is available in the vicinity. Only rigging and air item maintenance personnel are needed to execute this process.

This process can service multiple customers by flying in a circuit route and dispatching airdrop loads to customer after customer. Airdrop requires more airspace control than does the process that does not involve airdrop. Because multiple items of equipment may pass through multiple air corridors, additional coordination with other military airspace users is needed.

The greatest disadvantage of this process is the reduction in lift capacity due to the additional weight of the precision airdrop equipment.

Blimp Hovers; Smaller UAVs Deploy and Land

This process involves loading a heavy-lift blimp with smaller UAVs that, in turn, are loaded with supplies. The blimp then takes off and stations itself in a position in the air to wait for supply requests or orders. As orders are received, the heavy-lift airship deploys the UAVs carrying supplies. The UAVs land near their customers, and supplies are offloaded.

Blimps can be constructed to airlift up to 160 tons in a cargo area 50 meters by 8 meters by 8 meters. They can be controlled from ground stations through takeoff, flight, and landing. Because of the additional

cargo capacity that blimps can provide, UAVs operating from them could be used for ammunition resupply. Parafoil airdrop systems can deliver loads weighing up to 21 tons from aerial platforms to target areas on the ground using a glide ratio of 3 to 1. (A glide ratio of 3 to 1 enables supplies to be sent to the ground out to distances three times the altitude of the aerial platform at the time of airdrop cargo release.)

The heavy-lift blimp provides increased responsiveness when compared to ground-based processes. By having supplies in the air all the time as part of this process, no additional time is needed to load cargo in response to a sudden, unexpected request.

The use of blimps and UAVs is expected to provide the same benefits of reduced risk to delivery personnel when compared to manned systems, the same opportunities for interoperability, and the same level of asset visibility as the other processes considered. This process also enables logistics resupply as efficient as that provided by other manned and unmanned aerial supply methods for a noncontiguous operation.

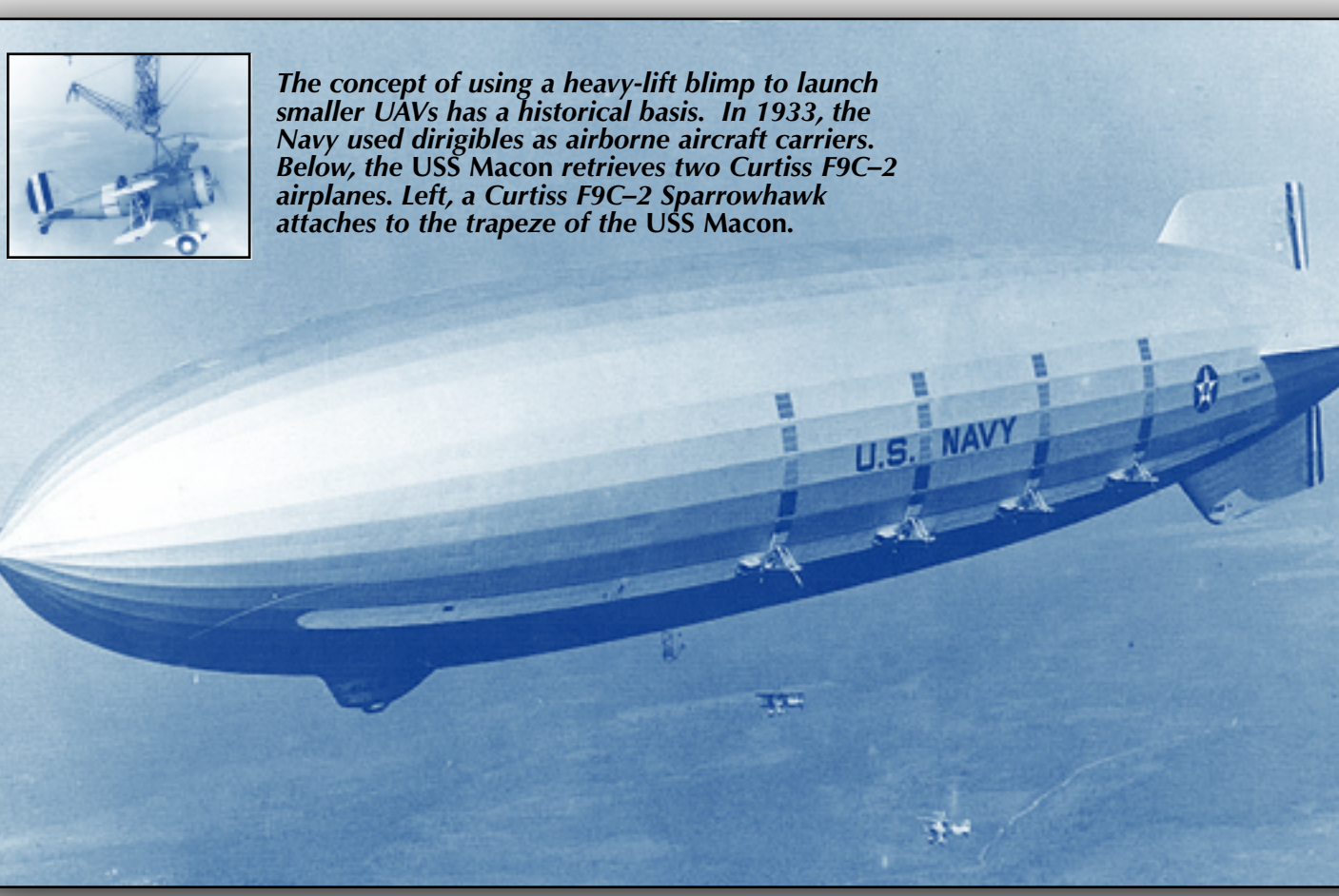
However, despite providing relative increases in responsiveness, this process does not perform as well as the other processes. The use of blimps and UAVs likely would be chosen only if assets of the other processes were fully committed and this process was used to supplement their capabilities.

This system rates worse than simpler take-off-and-land and take-off-and-airdrop systems in reliability, footprint, and personnel required. The requirement for multiple vehicles in this process complicates airspace control more than processes using a single vehicle, and the requirement for destination airfields limits the flexibility of this process to respond to unforeseen requirements.

Blimp Hovers; Smaller UAVs Airdrop and Return

This process involves loading a heavy-lift blimp with smaller UAVs carrying supplies. The blimp takes off and stations itself in a position in the air to await supply requests or orders. As orders are received, the blimp deploys the smaller UAVs, which then fly over their customers airdropping supplies. The UAVs then return empty to the blimp for future use.

Blimps can launch and recover smaller aircraft. Smaller UAVs could be constructed to depart from blimps, fly to designated release points, and discharge precision airdrop loads to customers on the ground. Those same UAVs could return, be hoisted inside the blimp's cargo area, and be reloaded automatically by



***The concept of using a heavy-lift blimp to launch smaller UAVs has a historical basis. In 1933, the Navy used dirigibles as airborne aircraft carriers. Below, the* USS Macon *retrieves two Curtiss F9C–2 airplanes. Left, a Curtiss F9C–2 Sparrowhawk attaches to the trapeze of the* USS Macon.**

mechanical systems that deposit additional cargo into each UAV's cargo bay.

This process would provide the tactical advantage of extending the distance from danger at which UAVs (in this case, unmanned supply blimps) could hover. Advantages gained by increasing the distance from air threats would enhance the survivability of the blimps.

This process is the best when considered against the criteria of responsiveness and flexibility. Supplies in the air would not require time to load, taxi, and take off, so the customer wait time when responding to unexpected supply requests would be reduced. Without the need for landing zones near unexpected customers, the customer wait time would be reduced. Customers far from suitable vehicle landing sites could be supplied by airdrop. This process is the most responsive and flexible of all the UAV supply processes considered.

This process also is the best for supporting multiple customers. A single system could serve customers at many aerial release points as multiple delivery vehicles dispatch multiple airdrop loads. No other system has such a widespread simultaneous delivery capability.

This process is expected to provide the same benefits of reduced risk to delivery personnel when compared to manned systems, the same opportunities for interoperability, and the same level of asset visibility as the other processes considered. This process also enables logistics resupply in a noncontiguous operation that cannot be supported by ground lines of communication.

This process also has disadvantages. It requires the most personnel and the biggest footprint and is the most complicated. It presents the most difficult airspace management scenario and is likely to be the least reliable. Personnel would be required to maintain the heavy-lift and delivery vehicles, the automated loading system, and the airdrop equipment. Space would be required for the heavy-lift vehicle, the delivery vehicles, the controllers, and the rigging areas. The various airspaces required by the heavy-lift vehicle, the delivery vehicles, and the airdrop cargo itself all require deconfliction with other airspace users. The requirement of this process for complicated airborne launch and recovery of delivery vehicles and for multiple airdrop systems reduces the process reliability.

Potential Systems Versus Existing Systems

The delivery of meals, ready to eat (MREs), provides a good subject for a comparison of the different modes of delivery since virtually all Army consumers of supplies on the battlefield require resupply of MREs at some point. Current modes of MRE distribution to be considered in the comparison include

A rotary-wing aircraft conducts a slingload delivery.

cargo truck, helicopter slingload, watercraft, fixed-wing airdrop, and fixed-wing air land.

Cargo truck delivery—the most prevalent resupply system used by the Army—involves loading cases of MREs into the cargo area of a truck that subsequently travels by road to the customer. Helicopter slingload involves strapping cases of MREs into a cargo sling that hangs from a hook on the bottom of a helicopter as it flies from the supply pickup point to the delivery point. In watercraft delivery, cases of MREs are loaded onto lighters, flat-bottomed boats, or barges and transported from port to port. For fixed-wing airdrop, airplanes are loaded with pallets of MREs rigged for airdrop, the airplanes are flown to a release point above a customer, and the cargo is released to travel by parachute to the customer on the ground. In fixed-wing air land, cases of MREs are loaded onto fixed-wing aircraft, the airplanes are flown to a destination airstrip and landed, and the MREs are discharged from the aircraft.

The modes of supply delivery can be compared using the following categories: risk of loss of life, response time, versatility, suitability, less-than-truckload supply operations, and complexity.

Risk of loss of life. The mode presenting the greatest risk to life is truck transport because its manned systems are restricted to moving along linear lines of march. Watercraft deliveries also risk loss of life because watercraft are restricted to the surface of the water, where their operators are vulnerable to surface threats, mines, and enemy watercraft. Helicopter slingload and fixed-wing air land each involve risks to life, though to a lesser extent than do watercraft and truck distribution. Flight paths are impossible to mine, and aircraft follow less predictable routes. However, the need to land on the ground to discharge their loads increases their vulnerability. Fixed-wing airdrop involves the least risk to life of any of the manned modes because the aircraft do not need to land in customer areas.

All four of the potential UAV solutions offer less risk to life because no humans are employed along the route between the source of supply and the customer.

Response time. UAVs equal or exceed the best performances of the best existing modes of delivery. The most responsive of the existing modes is airdrop because the aircraft used to conduct airdrop travel very

The second DarkStar unmanned aerial vehicle successfully completed its first flight after taking off from the Air Force Flight Test Center at Edwards Air Force Base, California.

fast and require no cargo offload time. Fixed-wing air land is the next most responsive mode, because it travels at the fastest speeds and the cargo can be offloaded quickly at the destination airstrip. Helicopter slingload ranks third, and trucks fourth. Watercraft rate the slowest in response time because they move at speeds that peak at around 12 knots—only 13 miles per hour.

UAVs are equal to, and in some cases are much better than, existing modes of delivery when considering response time. If one were trying to reduce risks to life, using UAVs would do so without increasing response time.

Versatility. Delivery by UAV equals the more versatile existing mode of MRE delivery. The more restricted of the existing modes are watercraft and trucks because they are confined to certain surfaces. The more versatile delivery modes are helicopter slingload, fixed-wing air land, airdrop, and the proposed UAV operations. These modes can deliver over both water and land.

Suitability. For noncontiguous operations, the capabilities of UAVs are equal to or better than those of existing modes of distribution. When the customer is operating in enemy territory or the enemy has cut off all ground lines of communication to the customer, watercraft and trucks cannot make the deliveries. In such cases, air modes of resupply must be used, and the UAV concept provides the same capabilities as existing air modes without risking loss of life. The UAV concept is particularly well suited for noncontiguous operations because it can make deliveries without the risk to life that all manned operations have.

Less-than-truckload supply operations. The UAV concept is the most efficient possibility for the delivery of quantities of supplies that will not fill a truck. If a few cases of MREs were needed on the battlefield, small UAVs would be the best possible means of delivery. The use of existing fixed-wing aircraft to deliver three cases of MREs would waste the airplane's remaining cargo space. Using a helicopter, watercraft, or truck to deliver such a small quantity also would commit an entire large asset and waste its unused cargo space. However, a UAV with a small cargo-carrying capacity could be developed to meet the requirement without wasting cargo capacity. Trucks then could be saved for carrying full truckloads. Small loads requiring delivery could include small repair parts, software, or medicines and other lifesaving medical supplies.

Complexity. UAVs are among the most complex of the delivery modes, while the least complex mode is the truck. UAV take-off-and-landing and take-off-and-airdrop processes are less complex than those of their manned air counterparts because they do not need subsystems for cockpit operations. Reduced complexity typically translates into greater reliability and reduced costs, both preferred characteristics.

Watercraft are more complex than trucks because they require operators trained in navigation and maritime skills. Manned rotary-wing and fixed-wing systems are even more complex, and UAVs are the most complex. The two proposed solutions involving a heavy-lift UAV hovering and other UAVs deploying from it are the most complex of any mode considered.

To reap the less-risk-to-life and responsiveness benefits associated with the more complex UAV systems, there is a tradeoff in greater complexity, lower reliability, and higher cost. However, to reap the lower risk-to-life benefits associated with the less complex UAVs, no tradeoff in complexity need be made. In fact, in these cases, added benefits of reduced complexity and cost may be gained when compared to existing manned rotary-wing and fixed-wing systems.

The Army should develop and implement the unmanned aerial logistics vehicle concept. Once the concept is proven in principle, the responsiveness, precision, and supply capabilities of unmanned aerial logistics vehicles will lead Army unit supply customers to determine additional applications. As processes evolve, additional benefits are possible. The Army should pursue each proposed UAV process either to fruition or to the point at which the costs of development and implementation exceed the expected benefits.

Military UAVs are useful today, particularly in the areas of reconnaissance and ordnance delivery. Innovation should expand the role of military UAVs to the arena of logistics resupply. **ALOG**

Major John V. McCoy is the S–3 operations officer of the 106th Transportation Battalion at Fort Campbell, Kentucky. He has a bachelor's degree in electrical engineering from Rensselaer Polytechnic Institute in New York and master's degrees in logistics management from Florida Institute of Technology and military arts and sciences from the Army Command and General Staff College. He is a graduate of the Infantry Officer Basic Course, the Combined Logistics Officers Advanced Course, the Combined Arms and Services Staff School, and the Army Logistics Management College's Logistics Executive Development Course.

ALOG NEWS

(continued from page 2)

• Leverage and enable interdependent, network-centric warfare.

• Create modular, capabilities-based unit designs. Retain campaign qualities while developing a joint and expeditionary mindset.

• Redesign the force to optimize the Active and Reserve component mix across the defense strategy.

• Ensure unit stability and continuity, and provide predictability to soldiers and their families.

• Provide situational understanding to commanders with speed, accuracy, and confidence to impact current and future operations.

• Enhance the ability of installations to project power and support families.

• Clarify roles and enable agile decisionmaking.

• Redesign resource processes to be flexible, responsive, and timely.

• Tell the Army story so the Army's relevance and direction are clearly understood and supported.

The entire document is available on the Army home page by clicking on "The Way Ahead" at the top of the page.

TRANSCOM TAKES STEPS TO BECOME DISTRIBUTION PROCESS OWNER

The U.S. Transportation Command (TRANSCOM) was scheduled to establish in January a Deployment and Distribution Operations Center (DDOC) to serve under the tactical control of the commander of the U.S. Central Command (CENTCOM). This is one of the first developments to result from the designation of TRANSCOM as the Defense Distribution Process Owner by the Secretary of Defense last September.

The DDOC will deploy logistics experts to the CENTCOM area of responsibility in Iraq, where they will have the authority to direct airport operations, seaport operations, and land transportation in the theater. The DDOC will perform the same functions in the theater that TRANSCOM performs in the continental United States. As described by Air Force General John W. Handy, the TRANSCOM commander, "This is not going to be the 100 percent solution . . . but we'll get there, and we will provide the support in theater that we have from TRANSCOM here in the continental United States. All of us [TRANSCOM, the Defense Logistics Agency and other Defense agencies, and the armed services] will staff that organization and make it happen."

TRANSCOM also is working to—

• Improve its distribution structure.

• Standardize decisionmaking and information technology tools throughout the supply chain.

• Improve acquisition and distribution links in the supply chain.

• Better coordinate storage and transportation functions to eliminate the need for warehousing.

• Standardize processes across the supply chain for budget making, funding, and billing.

• Establish metrics to gauge progress toward the command's goals.

ARMY SEEKS TO IMPROVE MANAGEMENT OF EQUIPMENT HELD BY CONTRACTORS

The Army has undertaken a program to improve its ability to account for Government equipment that is in the custody of contractors. The Government Furnished Equipment (GFE) Accountability Initiative is a 6-month proof of concept sponsored by the Assistant Secretary of the Army for Financial Management and Comptroller; the Assistant Secretary of the Army for Acquisition, Logistics, and Technology; and the Army G–4. Its purpose is to design the processes and business rules needed to account properly for Government equipment held by contractors. The proof of concept began in November and is scheduled to end on 30 April.

The Army must be able to report financial information on all Army property, including GFE, by 2006. However, two current practices make meeting this requirement difficult: Contractors can account for GFE using any system they choose, and they are not required to depreciate the value of the equipment over time; and Army property book officers (PBOs) drop GFE from their property books when they transfer equipment to a contractor. The GFE Accountability Initiative seeks to correct these problems.

The Army's goal is to leave GFE on the property books and manage it at the installation level, with the Army providing accounting of the property for the contractor using the Defense Property Accountability System (DPAS). To accomplish this without undertaking the very difficult task of changing the

Federal Acquisition Regulation (FAR), the Army, within FAR guidelines, is making changes to the Army Federal Acquisition Regulation and other Army regulations. These changes will place GFE on one accountability system, thereby allowing the Army to obtain annual financial data from that system instead of having to rely on the DD Form 1662, DOD Property in the Custody of Contractors, that contractors now complete.

During the proof of concept, four installations (Fort Irwin, California; Fort Rucker, Alabama; Holston Army Ammunition Plant, Tennessee; and the Army Aviation and Missile Command at Redstone Arsenal, Alabama) will provide feedback on the creation of financial records using DPAS. Once the proof of concept proves successful, the Army will extend the processes and business rules to the rest of its installations until all GFE is properly accounted for on an Army property system and reported annually on Army financial statements in accordance with the Chief Financial Officer Act of 1990; the Federal Financial Managers Improvement Act of 1996; and DOD Instruction 5000.64, Defense Property Accountability.

DEPOT SYSTEM INTEGRATES LOG MODERNIZATION PROGRAM

The Army's maintenance depots have begun integrating the Logistics Modernization Program (LMP) into the Army Workload and Performance System (AWPS). LMP replaces the Standard Depot System (SDS) as the data source for the AWPS. Conversion of AWPS from SDS to LMP was completed first at Tobyhanna Army Depot, Pennsylvania. The other depots—Anniston, Alabama; Corpus Christi, Texas; Letterkenny, Pennsylvania; and Red River, Texas—currently are undergoing the conversion.

AWPS is Web-based, networked software for managing workload and resources and tracking performance. It is a capstone system that loads data from planning, timekeeping, payroll, and scheduling systems. AWPS was developed initially to better manage resources within the Army's depot community. It has been expanded within the Army Materiel Command to cover ammunition logistics, ammunition manufacturing, and base operations. In October 2001, the Army directed expansion of AWPS across all Army activities. Current expansion efforts include medical activities, other maintenance facilities, and base operations.

The origins of AWPS can be traced to the Army's problems in balancing employment levels, missions, and workloads within budget restrictions and personnel ceilings. In the fiscal year 1995 budget, Congress directed the Army to make improvements in this area.

The upgraded AWPS capitalizes on LMP's improved business processes and modern systems architecture. The new system provides managers with information on cost and schedule performance and personnel requirement levels in the context of a modernized business environment. According to Ken Sherman, the AWPS program director at the Army Field Support Command/Joint Munitions Command, at Rock Island Arsenal, Illinois, "This new system is a lot more efficient. The information is more timely, more discrete, more accurate data."

Four M109 Paladin self-propelled howitzers arrive by rail and are offloaded at Letterkenny Army Depot, Pennsylvania. The offloading completed a demonstration that tested military use of the Port of Philadelphia, Pennsylvania, and the Army's power-projection capabilities. The demonstration began when the Paladins were loaded on trucks at Anniston Army Depot, Alabama, for transport to the Port of Charleston, South Carolina. The Paladins were loaded on a landing craft, utility, for shipment to Philadelphia. After offloading at Philadelphia, the Paladins were placed on railcars for the move to Letterkenny. Each contractor involved in the demonstration was assigned a Paladin for tracking, and an electronic tracking device was affixed to that vehicle to provide location information via satellite.

NATO ACTIVATES NBC DEFENSE BATTALION

The North Atlantic Treaty Organization (NATO) Chemical, Biological, Radiological, and Nuclear Defense Battalion became operational in December. The multinational battalion is designed to defend against and respond to attacks by weapons of mass destruction. Supporting NATO countries will supply specific capabilities in 6-month rotations.

The battalion's capabilities fall within the following categories: nuclear, biological, and chemical (NBC) reconnaissance operations; identification of NBC substances; biological detection and monitoring operations; NBC assessments and advice for NATO commanders; and NBC decontamination operations. The United States' first rotation is in support of the battalion's deployable NBC analytical laboratory. During its second rotation, the United States will support the biological laboratory and sampling team.

The battalion is currently at the initial operational capability level but expects to be at full capability by July.

DEPLOYABILITY PAMPHLETS REVISED TO INCORPORATE RECENT EXPERIENCES

The Military Surface Deployment and Distribution Command Transportation Engineering Agency (TEA) has revised three reference documents on deployability based on recent deployments and exercises. [The Military Traffic Management Command was renamed the Military Surface Deployment and Distribution Command as of 1 January.]

TEA Pamphlet 70–1, Transportability for Better Deployability, contains information on limitations affecting highway, rail, marine, and air transportation. This information will benefit materiel developers and equipment designers as well as transporters. It includes tables on vehicle sizes, information required in Transportability Reports, and data on many marine vessels.

TEA Pamphlet 55–19, The Tiedown Handbook for Rail Movements, includes updated information on spanners, rail ramps, different types of flatcars, inspection requirements for steel banding sealing tools, and practical tips for units moving by rail. Information on blocking and wire rope tiedowns, which are seldom used anymore on military vehicles, was removed. [This information still can be found on the TEA Web site; see "TEA Pamphlet 55–19, Fifth Edition."]

TEA Pamphlet 55–23, The Tiedown Handbook for Containerized Movements, offers new information on palletized load system flatracks, transportation of privately owned vehicles in containers, air transport of containers, maximum dimensions for items transported in containers, and lashing and lifting requirements for vehicles on flatracks.

These pamphlets are available on the TEA Web site at www.tea.army.mil.

The 1,200 soldiers of the 8th Battalion (Aviation Intermediate Maintenance [AVIM]), 101st Aviation, played a key role in deploying the 101st Airborne Division (Air Assault) from its home station at Fort Campbell, Kentucky, to Kuwait for Operation Iraqi Freedom. They received more than 250 helicopters, which they broke down or folded and then shrink-wrapped for shipment at the Port of Jacksonville, Florida (shown above). The battalion provided command and control for downloading division equipment at a port in Kuwait. The 2d Battalion, 502d Infantry, operated the vehicle staging area. Within 9 days, the 8th Battalion cleared the port and occupied a base camp along the Kuwait-Iraq border. The battalion's Headquarters and Headquarters Company and A Company provided theater support at Camp Udairi, Kuwait, while its B Company and C Company were deployed forward in Mosul and Qayarrah, Iraq, to support the division's aircraft.

LTA AND PENN STATE OFFER LOGISTICS TRANSFORMATION COURSE

The Army Logistics Transformation Agency (LTA), in collaboration with Pennsylvania State University's Center for Supply Chain Research, has developed a 5-day course that provides an in-depth overview of ongoing logistics transformation activities. The course focuses on strategies for mastering change management and on the latest supply chain management practices, tools, and trends.

The course, "Logistics Transformation Management—Developing and Accelerating Logistics Change," was developed as a result of the institutionalization of logistics transformation in the past year. It is designed for process- and product-owner representatives and for individuals in supervisory, planning, and management positions.

The course incorporates lessons learned from Operations Enduring Freedom and Iraqi Freedom, which validated the logistics transformation requirements for logistics connectivity, improved distribution, demand reduction, and enhanced mobility and deployability.

The inaugural class was held in October at the main Penn State campus in State College, Pennsylvania. It was moderated by Roger Kallock, the former Deputy Under Secretary of Defense for Logistics and Materiel Readiness, and included speakers from the private and public sectors and workgroup sessions on the Army G–4's focus areas.

The next classes are scheduled for 15 to 19 March and 21 to 25 June at State College. For more information, contact William Koenig of LTA at DSN 771–6655 or email william.koenig@hqda.army.mil.

A high-mobility artillery rocket system (HIMARS) is downloaded (above) from a C–130 Hercules transport at Fort Sill, Oklahoma, on 19 November after a flight from Redstone Arsenal, Alabama. This was the first time a HIMARS was flown more than 650 nautical miles while combat loaded with live rockets. The rocket launcher was downloaded and ready to fire in less than 20 minutes. Below, the HIMARS fires a six-rocket volley of reduced-range practice rounds. The HIMARS is being evaluated in a joint effort by the Army, Air Force, and Marine Corps to find a way to provide early-entry and light forces protection and firepower on the battlefield.

CSS CONFERENCE SCHEDULED

Major General Terry E. Juskowiak, Commander of the Army Combined Arms Support Command and Fort Lee, will host the 2004 Combat Service Support (CSS) Commanders and Command Sergeants Major Conference at the Lee Club at Fort Lee, Virginia, on 8 and 9 April. The conference will begin at 1400 following the close of the Association of the United States Army (AUSA) Logistics Transformation Symposium and Exhibition, which will take place 6 to 8 April in the Greater Richmond (Virginia) Convention Center.

The theme of the conference will be "Expeditionary Sustainment in Support of Combatant Commanders." Presentations will focus on important logistics initiatives underway that will have an impact on maneuver sustainment and transformation.

The conference is open to Active and Reserve component battalion-level and above CSS leaders in the ranks of sergeant major and above and joint service equivalents.

More information about the conference, lodging, and online registration can be found on the Web at www.cascom.army.mil/2004_CSS_Cdrs_Conf/index.htm or by emailing csscdrcsmconf@lee.army.mil.

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.

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Coming in Future Issues—

- **Joint Distribution Operations**
- **Sea Basing and the Maritime Pre-positioning Force**
- **Medical Logistics During Operation Iraqi Freedom**
- **Maintenance Assessment for the Reserve Component Commander**
- **Slingload Operations in Heavy Units**
- **Hospital Logistics Support for OEF/OIF**
- **Water Purification in Urbanized Areas**
- **An Introductory Analysis of Auto-ID Applications**
- **Fueling the Force at the JRTC**
- **Logistics Transformation of the Army Oil Analysis Program**
- **Understanding JOPES**

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