ARMY LOGISTICIAN

MARCH-APRIL 1996

Logistics: Spearhead for Operation Joint Endeavor

Also in this issue—

- Velocity Management: A Status Report
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- Crisis in Strategic Sealift
- Log Internet

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DEPARTMENTS

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COVER

Spearheading preparations for Operation Joint Endeavor, the Army advance liaison team, comprised of logistics, operations, intelligence, and civil affairs specialists, arrives in Tuzla, Bosnia-Herzegovina, on 6 December. The team's mission was to set up the infrastructure to support the follow-on forces. The Air Force's C-130 from the 37th Airlift Squadron, Ramstein Air Base, Germany, that transported the team was the first fixed wing aircraft to arrive at Tuzla. The story begins on page 2. (U.S. Air Force photo.)

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.

By Order of the Secretary of the Army:

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01150

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ALOG DIGEST

IMPROVEMENTS CONTINUE UNDER VELOCITY MANAGEMENT PROGRAM

A recent innovation resulting from the velocity management program is a tool that will make the stockage determination process more accurate and reliable. The application will help logisticians make quicker and more efficient transitions from peacetime and garrison stockage inventories to inventories that will support contingencies and actual deployment operations.

The optimum stockage requirements analysis program (OSRAP) is designed for use at the support level. Developed by the Army Materiel Systems Analysis Agency (AMSAA), Aberdeen Proving Ground, Maryland, the application is a user-friendly, Windows-based, graphical user interface designed for use on a 486DX desktop computer. The logistician in the field can enter factors such as major end-item equipment densities, weight and cube of stocks, cost, desired weapon system readiness, length of mission, order and shipping time, and operational tempo; the computer then will generate a proposed stockage list. The application can quickly compare budgets with availability of equipment, resulting in better stockage decisions. All variables can be quickly and easily adjusted to reflect changing conditions. OSRAP will interface with standard Army management information systems and the wholesale system.

Improving the stockage determination process during the critical predeployment preparation and transition phase will result in gains in combat readiness, deployability, and confidence in the supply system. AMSAA is working with the Army Combined Arms Support Command (CASCOM), Fort Lee, Virginia, and the Office of the Deputy Chief of Staff for Logistics, Washington, D.C., to get a prototype of this support tool into the field during this quarter of the fiscal year.

SOLDIERS DEPLOYED TO BOSNIA MAY CONTINUE TRAINING

The Army Training and Doctrine Command (TRADOC), Fort Monroe, Virginia, is working with the 7th Army Training Command, Grafenwoehr, Germany, to identify individual training requirements for soldiers deployed to Bosnia. Professional development training and education of deployed soldiers needs to continue so a training backlog, such as the one that occurred after Operation Desert Storm, can be avoided.

TRADOC proposes providing intheater education and training to the extent that operational requirements will allow. Four training delivery methods—live, virtual, constructive, and institutional—are being considered. Video teletraining and other distance learning technologies will be used to train soldiers in forward and main areas.

TRADOC's goal in continuing education and training opportunities to deployed soldiers is to sustain the warfighting skills of U.S. forces; conduct mission training to include mission planning and rehearsal; support professional development; and provide "on demand" sustainment training.

ELECTRONIC TECHNICAL MANUALS TO DIGITIZE MAINTENANCE PROCESS

The Army continues to move ahead with its project to convert to compact disks thousands of bulky paper technical manuals used by maintenance personnel. The disks will contain all manual repair parts and special tools lists, parts lists, battle damage assessment repair manuals, technical bulletins, supply bulletins, and all other publications necessary to maintain Army equipment.

When implemented, the system will allow a soldier to order a repair part for a major weapon system simply by locating it in the digitized technical manual and either pointing and clicking the mouse or touching the part displayed on the screen. The part will be ordered automatically through either the unit level logistics system (ULLS) or the standard Army maintenance system (SAMS).

Interface software for the electronic technical manuals (ETM) system is being developed by Information Technology Solutions, Petersburg, Virginia. The system will be fielded with soldiers of the 2d Armored Division at Fort Hood, Texas, and the 24th Infantry Division (Mechanized) at Fort Stewart, Georgia, from March to July 1996. Changes resulting from the field testing will be incorporated into the software. The prototype software, ETM-Integration, will then be handed off to the Project Manager for Integrated Logistics Systems in the Army Combined Arms Support Command at Fort Lee, Virginia, for integration into ULLS and SAMS.

The savings to the taxpayer of the electronic manuals are phenomenal. Each paper manual costs $58 to

produce; each compact disk version costs approximately $1. The biggest savings will be associated with the point-and-click ordering process. Countless hours of manual ordering time are saved and errors resulting from copying part numbers with pencil and paper are eliminated. Gone forever will be the labor-intensive page inserts. Updated technical manuals with changes already incorporated will be sent to users automatically.

Because each compact disk can contain the equivalent of 40,000 pages of text, soldiers can deploy lighter. The data contained on six compact disks would have to be transported by a truck and a trailer if it were in paper form.

Other benefits of ETM's include reduced maintenance downtime, improved repair capabilities, reduced repair parts consumption, and reduced training time.

DLA RENAMES INVENTORY CENTERS

As the Defense Logistics Agency (DLA) consolidates and realigns its management structure to better serve its customers throughout the Government, three of its national inventory control points are assuming new names. The new names will reflect more accurately the wider missions of DLA's supply centers under the realignment.

As of 31 December 1995, the Defense Construction Supply Center at Columbus, Ohio, and the Defense General Supply Center at Richmond, Virginia, were renamed Defense Supply Center, Columbus, and Defense Supply Center, Richmond, respectively. The Defense Personnel Support Center at Philadelphia, Pennsylvania, will be renamed Defense Supply Center, Philadelphia, at a later date.

Of DLA's other national inventory control points, two will be realigned into other centers as directed by base realignment and closure commissions: the Defense Industrial Supply Center in Philadelphia will be incorporated into Defense Supply Center, Philadelphia, and the Defense Electronics Supply Center in Dayton, Ohio, into Defense Supply Center, Columbus. The Defense Fuel Supply Center at Fort Belvoir, Virginia, will remain unchanged.

When the realignments are completed, DLA will have four national inventory control points: the Columbus and Richmond centers, which will be responsible for item management and purchase of equipment used in weapon systems; the Philadelphia center, responsible for troop and general support items, such as food, clothing, medical supplies, and industrial materials; and the Defense Fuel Supply Center.

DEPOT TESTS PAPERLESS PRODUCTION

Personnel at Tobyhanna Army Depot, Pennsylvania, recently completed a demonstration project in which they used electronically transmitted technical design data, rather than paper drawings and specifications, to produce printed circuit boards. The demonstration showed the growing capabilities of joint computer-aided acquisition and logistics support (JCALS), the Department of Defense program to use electronic transmission in place of paper to transfer technical data among acquisition and logistics personnel.

The Tobyhanna project was the fifth annual demonstration of the initial graphic exchange specification (IGES), which is an industry standard for paperless transfer of technical data. Previous IGES demonstrations concentrated on mechanical drawings; the Tobyhanna exercise was the first to emphasize transfer of electronics data. IGES is an interim system that will be replaced by the standard for the exchange of product model data (STEP).

Tobyhanna workers relied on electronically transmitted technical drawings and design data to produce printed circuit boards for the power supply for a telescope tracking device, as well as cabling and other wiring harnesses required for the boards to function properly. Tobyhanna was chosen for the demonstration because of its flexible computer-aided manufacturing capability, which allows the depot to use state-of-the-art computer technology to rapidly manufacture electronic components.

EFFORT MOUNTED TO REDUCE BATTERY COSTS

The Army spends more than $75 million a year to purchase batteries of various kinds. Battery procurement offers a significant opportunity to reduce operation and support costs. The Army Materiel Command (AMC), Army Training and Doctrine Command (TRADOC), U.S. Forces Command (FORSCOM), and the Defense Logistics Agency (DLA) have formed the Army Battery Confederation, which will promote battery standardization throughout the services and reduce battery costs. Estimates are that battery procurement costs can be reduced by more than $3 million a year.

AMC's Communications-Electronics Command, Fort Monmouth, New Jersey, was tasked to establish the AMC Battery Management Office. That office is charged with planning, testing, and executing the confederation's battery management initiatives. The Army Tank-automotive and Armaments Command (TACOM), Warren, Michigan, is developing initia-

tives to reduce vehicle battery costs.

Points of contact for the Army Battery Confederation are—Richard Rizzon, Battery Management Office, DSN 992-8941; Wsewolod Hnatczuk, TACOM, DSN 786-8751; Herb Russakoff, TRADOC, Army Combined Arms Support Command, DSN 687-0599; Joe Franklin, DLA, DSN 695-6148; Ed Huffman, FORSCOM, DSN 367-6755; and the Office of the Deputy Chief of Staff for Logistics, DA, DSN 224-3227.

LOGISTICS AWARDS PRESENTED

The Assistant Secretary of the Army for Installations, Logistics, and Environment, the Honorable Robert M. Walker, and the Deputy Chief of Staff for Logistics, Lieutenant General Johnnie E. Wilson, recently recognized the achievements of Army personnel who performed exceptional integrated logistics support (ILS) functions in 1995. The winners of the three ILS achievement of the year awards for excellence are—

- *Category I, ILS execution and process improvement*: ILS/MANPRINT Management Office, Army Missile Command, Redstone Arsenal, Alabama.
- *Category II, ILS management*: Ms. Lisha H. Adams, Joint Tactical Unmanned Aerial Vehicle Project Office, Redstone Arsenal, Alabama.
- *Category III, logistics support improvement for materiel and information systems*: Logistics Engineering and Logistics Laboratory Management Team, Army Missile Command.

The winners received certificates of achievement and engraved plaques at a 6 December ceremony at the Pentagon and subsequent monetary awards at Redstone Arsenal.

Notification letters for the 1996 competition are being distributed in February. Nomination packets are due to HQDA, DCSLOG, ATTN: DALO-SMM, Washington, DC, by 28 July 1996.

MTMC TESTS RESERVE SUPPORT

Eastern Contingency, a command post exercise conducted by Military Traffic Management Command Eastern Area (MTMCEA), provided valuable training to reserve component units designated for port operations in a contingency. The exercise was held in conjunction with the Military Sealift Command, Atlantic (MSCLANT), exercise Display Ready '95. The exercises gave both commands the opportunity to evaluate the readiness of designated mobilization units and determine where the units needed to improve. MTMCEA and MSCLANT work together closely in contingencies to deploy troops overseas.

Eleven reserve component units participated in Eastern Contingency. Only three units physically deployed for the exercise: the 1174th Transportation Terminal Battalion, Fort Totten, New York, to Military Ocean Terminal, Bayonne, New Jersey (headquarters of MTMCEA); the 1176th Transportation Terminal Brigade, Baltimore, Maryland, to Newport News, Virginia; and the 1186th Transportation Terminal Brigade, Jacksonville, Florida, to the port of Jacksonville. The other units took part in the exercise at their reserve centers.

In all, the 11 units "conducted" operations at 7 ports. Each unit established a soldier readiness processing center to check if individual soldiers' records were ready for deployment. The units practiced receiving, staging, and loading equipment for such units as the 82d Airborne Division. The data base used for the exercise contained built-in problems designed to challenge exercise participants; exercise controllers added other problems.

The exercise also included a mock callup of MTMCEA's individual mobilization augmentees (IMA's). MTMCEA attempted to contact 110 of its 139 IMA's; of 82 reached, 80 percent said they would be able to report to their mobilization sites on time.

COMMANDERS MAY BE HELD RESPONSIBLE FOR SOLDIERS' DIETS

Commanders soon may be held accountable for making sure their troops eat enough. According to a report from the National Academy of Sciences' Institute of Medicine, eating too little can impair troops' ability to march, shoot, and carry heavy packs, and it may affect their ability to make proper decisions.

In a report published last September, the academy's committee on military nutrition research recommended that adequate food consumption be included in battlefield doctrine, as is now the case with water intake, so commanders and their troops do not ignore it.

Research indicates that performance begins to deteriorate when undereating causes weight losses as small as 3 to 5 percent. Larger losses may be potentially debilitating. When physically fit soldiers lose weight, they tend to lose muscle because they don't have much fat. Muscle loss degrades performance more than fat loss.

In battlefield environments, soldiers are inclined to eat less because they have cold food and are exposed to rain, dirt, extreme temperatures, exploding shells, and enemy troops. Anxiety, fatigue, and pain can

depress appetites and cause troops to skip meals altogether. Meals-ready-to-eat, provide troops a well-balanced, calorie-rich diet, but only if the entire packaged meal is consumed.

In the Tactical End Item Repair Facility (TEIRF) at Tobyhanna Army Depot, Pennsylvania, high-mobility, multipurpose, wheeled vehicles (HMMWV's) wait for maintenance on their electronic systems. The new facility serves as the center for the beginning and end stages of the maintenance process. Electronic components onboard all types of shelters and vans are disassembled, sent to other shops for overhaul and repair, brought back to the TEIRF, reassembled, tested, and sent to the field. Up to 332 people can work in the TEIRF's 87,000 square feet of production area.

FORT STEWART DIVISION USES CUTTING-EDGE TECHNOLOGY FOR TRAINING

The 24th Infantry Division (Mechanized), Fort Stewart, Georgia, is the first heavy mechanized division to train with the forward area air defense (FAAD) command, control, communications, and intelligence (C^3I) system. FAAD is an automated network that allows all involved groups, from the division main tactical operations center to the fire units, to see, in real time, where and how enemy aircraft are moving.

With the FAAD, the air battle management operations center and the Army airspace command and control van tie in with every major subordinate command node and receive a single-channel ground and airborne radio system (SINCGARS) signal or an Army data distribution signal from an airborne warning and control system (AWACS), a Navy Hawk Eye, or a high- to medium-altitude air defense (HIMAD) platform. The FAAD unit also has ground-based sensors that look for airplanes. A correlated air picture is sent to everyone in the division who has Stinger missiles. The FAAD system has almost complete situational awareness, which makes coordinated attacks possible.

Elements of the 24th Infantry Division (to be renamed the 3d Infantry Division (Mechanized) on 31 May) tested the equipment last summer in Oro Grande, New Mexico, and brought some of the equipment back to Fort Stewart for training. They later received the rest of their equipment and used it in a Warfighter exercise at Fort Stewart and in an exercise at Gulfport, Mississippi, where they trained with a Patriot unit and a Marine Corps Hawk unit.

MATERIEL MAINTENANCE MANAGERS CAN ENHANCE CAREERS WITH TRAINING

The functional chief representative for career program 17 (CP-17), materiel maintenance management, urges career program managers and supervisors to encourage CP-17 employees to pursue several unique training opportunities listed in the FY 96 Catalog of Civilian Training, Education and Professional Development Opportunities. Few in the CP-17 program are taking advantage of the following programs—

- A 6- to 12-month professional development assignment as a staff action officer at locations such as the Pentagon; Headquarters, U.S. Forces Command; and Headquarters, U.S. Army, Europe.
- Developmental assignment as special assistant to the functional chief representative for CP-17.
- Tuition assistance for full- or part-time attendance at logistics or business-related courses at a university of the applicant's choice.
- Short-term training assignments proposed by the individual, such as training with industry, shadow assignments at higher echelons, or logistics-related special projects.
- A 10-month research fellowship at Harvard University.
- A 1-year assignment to the Maintenance Policy Office in the Office of the Deputy Under Secretary of Defense for Logistics in the Maintenance Management Professional Enhancement Program.

For more information on these career training programs, consult the catalog described above, call Tony Dorsey at (703) 695-0286 or DSN 225-0286, or send e-mail to dorsey@pentagon-hqdadss.army.mil.

ALOG EMPHASIS

CASSAMO'S APPROVED

The Army has approved establishing tables of organization and equipment (TOE's) for Combat Service Support Automation Management Offices (CASSAMO's) in all division support commands and corps support groups. [See article, "CSS Automation in a Heavy Division," page 22, January-February 1995 issue of *Army Logistician.*] Logistics automated systems are enabling logisticians to provide the best possible support to the forces. For optimal operation of the systems, users need responsive automation management support of capable, motivated, experienced personnel. The CASSAMO's, when fully staffed with qualified people, will bridge the gaps among system developers, providers, and users.

SUBSISTENCE CHANGES COMING

The Defense Personnel Support Center, Philadelphia, Pennsylvania, is continuing to develop and award prime-vendor contracts to provide subsistence (food) products to the services. The contracts are for implementation this year in the continental United States. The Office of the Deputy Chief of Staff for Logistics, Department of the Army, reminds Army installations that they must have plans developed and in place to provide uninterrupted support for field feeding operations. Prime vendors will deliver only to garrison dining facilities or designated warehouses, not directly to field units. Support plans need to be developed early to give dining facility managers and food service sergeants time to become accustomed to major procedural changes in receiving subsistence items at the "back docks" rather than from the troop issue subsistence activities.

NEW ALOG ADDRESS

Army Logistician has a new address for all mail delivered by the U.S. Postal Service (USPS). Correspondence mailed through USPS should be addressed to—

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(Continued on page 48)

ALOG EMPHASIS

(Continued from page 1)

WARNET EXPANDS TV TECHNOLOGY

In a pilot distance learning program called WARNET, the Army Training and Doctrine Command will train soldiers by satellite to support the readiness posture of III Corps at Fort Hood, Texas. Using the Army Teletraining Network, WARNET will test "Telemaintenance," a distance learning concept developed by the Army Ordnance Center and School at Aberdeen Proving Ground, Maryland, to deliver hands-on refresher and upgrade maintenance training. Lessons learned from WARNET will help identify additional uses of distance learning. Video teletraining has been used in the past to support Army troops assigned to peacekeeping duties, and plans are underway to use teletraining to support troops deployed to Bosnia.

DECA RECEIVES HAMMER AWARD

In Pentagon ceremonies held on 21 December 1995, the Defense Commissary Agency (DeCA), Fort Lee, Virginia, was presented the Hammer Award by Dr. John J. Hamre, comptroller, Office of the Secretary of Defense. The award was created by Vice President Al Gore to recognize Government agencies that cut red tape, put customers first, empowered their employees, and "returned to basics." DeCA's selection was based on the accomplishments of the Operations Support Center, which included establishment of the DeCA oversea ordering and receiving system, resale ordering agreements, and delivery ticket invoices. Accepting for DeCA was Major General Richard E. Beale, Jr., director.

ASK FOR AMMO LOG REVIEW

Army organizations that need assistance with their class V ammunition mission can call the Logistics Review and Assistance Office at the Army Defense Ammunition Center and School, Savanna, Illinois. The office conducts onsite reviews of all aspects of ammunition logistics and provides assistance to Army Materiel Command and Department of the Army organizations. The team will identify local and systemic problems and recommend corrective measures for improving the ammunition logistics system. For assistance, call (815) 273-8921 or DSN 585-8921.

STRATEGIC MOVE SUMMARY OUT

Recently published FM 55-65, Strategic Deployment, summarizes the tactics, techniques, and procedures that major commands and units must follow to successfully deploy—a matter of critical importance in today's force-projection Army. The manual describes strategic mobility automation support systems (such as the global transportation network); strategic deployment planning; air, rail, and convoy movements; and port of embarkation, reception and onward movement, and redeployment operations. It includes information on using rail guards and supercargoes; working with hazardous, classified, and protected sensitive cargoes; training for deployment; and preparing vehicles for movement.

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VIRTUAL DESIGN SAVES TIME

With a virtual prototyping process, engineers and designers at the Tank-Automotive Research, Development, and Engineering Center (TARDEC) in Warren, Michigan, are reducing the time it takes to bring a vehicle from concept to delivery. Based on user requirements, TARDEC engineers build a 3-dimensional computer model of the proposed vehicle. They test the vehicle in the virtual environment to see how it moves over terrain, how detectable it is to the enemy, and how resistant it is to enemy attack. Using wargame modeling, the engineers see how the concept vehicle fares in a "fight" with other vehicles. Refinements are incorporated into a more detailed 3-dimensional virtual prototype, and soldiers who may actually use the vehicle are asked to study it for possible oversights. Continuous refinements to the concept vehicle in the virtual environment help ensure the vehicle will need fewer alterations when actual production begins.

RE-REFINED OIL AVAILABLE

Three re-refined oil products are now available to Army and other Federal customers. The oil, made from recycled petroleum products, has a viscosity of 10w30 and meets industry standards for quality. It can be ordered by military or Federal standard requisitioning and issue procedures (MILSTRIP or FEDSTRIP) as a box of 12 one-quart bottles (national stock number [NSN] 9150-01-413-6897); a 5-gallon container (NSN 9150-01-413-6892); or a 55-gallon drum (NSN 9150-01-413-6990). Orders will be delivered directly from the vendor to the customer within 15 days (may be slightly longer for oversea orders). For more information, call Robin Champ at Defense Supply Center, Richmond (formerly the Defense General Supply Center), at 1-800-345-6333 or DSN 695-4908.

Logistics: Spearhead for

Last December, many soldiers may have been dreaming of a white Christmas. Nearly 20,000 of them got their wish, but it was not in the setting they had imagined. Instead of joyful celebrations of the holiday season surrounded by family and friends, they were headed for a land that promised bitter cold, few creature comforts, and even threats to life itself. Freezing temperatures, blinding snowstorms, land mines, snipers, narrow mountain roads, inadequate railways, and unsafe food and water were among the hazards that awaited the troops arriving in Bosnia. The soldiers were on their way to participate in Operation Joint Endeavor, a peacekeeping mission led by the North Atlantic Treaty Organization (NATO).

In the days preceding the holiday season, and in response to orders from President Bill Clinton, a handful of U.S. troops moved into Bosnia and Croatia as part of a small multinational force of logisticians who prepared for the anticipated arrival of an implementation force (IFOR) of about 60,000 troops from the U.S. Army, its sister services, and other NATO- and non-NATO nations. The IFOR would enforce military provisions of the peace agreement formally signed on 14 December in Paris by the warring parties of the Republic of Bosnia-Herzegovina, the Republic of Croatia, and the Federal Republic of Yugoslavia (Serbia and Montenegro).

On 15 December, 1 day after the peace accord was signed, U.S. troops were on trains from Germany, moving to a staging area in Hungary. Logisticians with this early contingent moved on into Bosnia-Herzegovina and set up command posts and communications systems and networks, planned transportation for people and equipment, arranged for supplies, gathered intelligence data, and located other assets that would be essential to supporting the IFOR. Half of the IFOR was expected to be in operation in early January, with the entire force in country 6 to 8 weeks following. As the main body of forces began arriving, among other things, they set about establishing a logistics network and expanding the Tuzla airfield in Bosnia. U.S. operations centered in the city of Tuzla and an adequate airfield was critical to operations.

During the December and January time frames, not all of the work and support activity was occurring in Bosnia. In Germany, units that were not yet in Bosnia but had been warned of possible deployment were preparing themselves with refresher combat skills training, such as tank gunnery practice and special peace implementation training. The special training included operating in every conceivable scenario in a "mini-Bosnia" complete with villagers, snipers, opposing forces, mines, mud, and CNN reporters.

In the United States, guardsmen and reservists were sent to Fort Benning, Georgia, or Fort Dix, New Jersey, for a NATO orientation before moving on to Germany for the special training. Many reservists were deployed to areas in Europe to fill in for active-duty troops who deployed to Bosnia.

In mid-December, many flights into the area were delayed or canceled because of snowstorms, a poor landing strip in Tuzla, and unsafe flying conditions. Troops en route at that time were forced to enter the theater by road and rail, which required logisticians to do some rapid calculations of transportation requirements. Some soldiers were stuck in Austria and Croatia because they couldn't move with their heavy equipment over some railway tracks and bridges.

The first troops to arrive in the theater were housed in Force Provider facilities that include modular tents with heated sleeping quarters, recreational areas, dining facilities, laundry service, and shower facilities. The shelters initially were no more than canvas tents, but heat, electricity, and wooden floors and walls were added. Most troops eventually will be housed in buildings in Bosnian cities.

The 54th Quartermaster Company completes refresher weapons training at Fort Lee, Virginia, before deploying to Germany en route to Bosnia.

Operation Joint Endeavor

Members of 3d Corps Support Command and the 30th Medical Brigade leave Rhein-Main Air Base, Germany, 14 December for Taszar, Hungary, to help prepare for arrival of the IFOR.

The troops initially got one hot meal—a heated meal, ready-to-eat (MRE)—each day, but soon thereafter they also were getting hot T rations for breakfast and dinner. Fresh milk, bread, and fruit were also provided early in the operation. Free mail service began in mid-December, including an "Any Service Member" APO number.

The 1st Armored Division is the major element of the U.S. military contingent in Bosnia. The 13,000-man force is equipped with M1A1 Abrams tanks, M2/M3 Bradley fighting vehicles, AH-64 Apache helicopters, and extra radar detectors to identify and attack hostile mortar and artillery fire. The division's intelligence analysts monitored terrorist activities worldwide that could target American troops in Bosnia. U.S. forces were instructed to patrol in small units, never alone; enforce tight security around base camps; and not socialize with local residents.

Twenty-two Active Army units in the United States were identified for potential deployment in support of the NATO IFOR in Bosnia. Among logistics units that deployed were the 54th Quartermaster Company, a mortuary affairs unit from Fort Lee, Virginia; the 102d Quartermaster Company, a petroleum, oils, and lubricants unit from Fort Campbell, Kentucky; and the 403d Transportation Company, from Fort Bragg, North Carolina, which would be responsible for transshipping cargo at highway, rail, barge, and air terminals.

In addition, 49 Army National Guard and Army Reserve units based in the continental United States and Puerto Rico were notified to begin training for possible deployment to the European Theater to support U.S. forces that would participate in NATO IFOR operations in the former Yugoslavia. Among these were units that perform transportation, public affairs, medical, military police, postal, materiel management, military history, and civil affairs functions.

Logistics concerns arose early in the predeployment stages that entailed advising soldiers on packing and storing household goods; storing privately owned vehicles; readying equipment for deployment; and addressing rail movement issues, such as establishing responsibility for equipment being deployed. U.S. Forces Command issued a series of logistics operations support messages throughout the predeployment phase to guide those planning and executing Operation Determined Effort, the prelude to Operation Joint Endeavor. Units deploying to Bosnia were required to ensure they had equipment on hand to meet S1 readiness status. Units were advised, for example, to ensure that their equipment was winterized and that heater systems were in good working order. Equipment in units going to Europe as backfill had to meet S2 readiness standards. This sometimes meant moving equipment from another location. Individual clothing and equipment were quickly specified for all personnel deploying to Europe and Bosnia, and units were authorized to obtain any missing items from mobilization stations.

Units were allocated a certain number of days of supply for each class of supply and were instructed to close class I accounts at their home installations and reestablish them in Europe. Units were instructed in procedures to follow in requesting Department of Defense activity address codes and for hand receipt holders' sub-unit identification codes. War reserve shortfalls were identified and provisions made to correct deficiencies.

When the United Nations turned the peacekeeping mission over to NATO, much of the logistics groundwork for supporting the IFOR was complete. Logistics and support personnel had helped form the spearhead for Operation Joint Endeavor. ALOG

Velocity Management:
A Status Report

by Major General Thomas W. Robison

In the May-June 1995 issue of *Army Logistician*, I announced the undertaking of our Army's exciting initiative called **velocity management** (VM). Just a short year ago (in January 1995), we held the kick-off meeting to apply VM precepts to processes we use to direct the flow of materiel and information through the Army Logistics System. As we observe the Army VM initiatives' "first birthday," I am pleased to report that there have been significant improvements in the Army Logistics System.

The main objective of the VM attack this past year was to reduce order and shipping time (OST) by January 1996. OST to several of the Army's divisions has been reduced by 40 percent. This reduction was achieved through the efforts of a cooperative team composed of representatives of the Defense Logistics Agency, U.S. Transportation Command, U.S. Forces Command, Army Materiel Command, Army Combined Arms Support Command, and divisional logisticians.

Our initial efforts were to make the *entire* logistics community aware of the VM program and get the community actively involved; develop a pilot implementation plan, which we completed in April 1995; and develop an Army-wide training plan, which we completed in September 1995. We followed up our initial efforts by making an indepth analysis (which is ongoing) of the current Army Logistics System and by making site visits to our Army's 10 divisions in the United States and overseas.

Our main approach in VM process improvement is three-phased: first, we define the current process; second, we measure it; and, third, we initiate changes to improve it. Thus far, we've focused our efforts on the core processes of OST, repair cycle time, and stockage determination.

Tom Edwards, my deputy at CASCOM headquarters, is executive agent for the OST process improvement team. Tom and his team defined OST as "the time elapsed from requisition of an item to the receipt of the item by the user." Their measurement baseline for the process was 1 July 1994 through 30 June 1995. During that time, OST took 26.5 days. Changes that were implemented to the process have reduced OST to Fort Bragg, North Carolina, by 60 percent; to Fort Campbell, Kentucky, by 58 percent; to Fort Irwin, California, by 56 percent; and to Fort Hood, Texas, by 40 percent.

In the coming year, the OST process improvement team will explore transportation issues that relate to fast, dependable delivery; automated system changes; backorders; manager intervention; serviceable retrograde; internal corps management reporting to capture time segments to fill requirements from authorized stockage lists in the standard Army retail supply system; and the interface of force deployment with strategic and operational logistics.

A. David Mills, director for maintenance policy in the Office of the Deputy Chief of Staff for Logistics (ODCSLOG), is executive agent for the repair cycle time process improvement team. David and his team have taken on the ambitious mission of redefining the repair cycle at all echelons of repair, both organic and contractor supported. Their definition of the repair cycle is all-inclusive, extending "from the motor pool and flight line, through the depot, to ready for issue." Improved responsiveness in the repair process will result in higher availability of weapon systems, decreased inventory requirements, lower repair expenditures at every echelon, and, finally, fewer holes on the shelves due to delays in repairing critical items in short supply.

The team has focused on repair cycles for weapon systems as a whole and on specified sets of components for these systems. Thus far, they have examined the AH-64 Apache and UH-60 Blackhawk helicopters, the M1A1/A2 Abrams tanks, the M9 armored combat earthmover equipment, and specific reparable components of the mobile subscriber equipment.

The repair cycle team has compiled an initial set of repair cycle data measurements for some of the weapon systems, to include some line replaceable units; and they have conducted several site visits to get a perspective of the entire repair process, paying particular attention to the retrograde flow. The team is now identifying certain "drivers" that contribute to poor repair cycle performance. The repair cycle team and the improvement teams at selected sites are working to neutralize the effect of those drivers.

In the coming months, the team will refine their current repair cycle data measurements and identify which "pieces" of the cycle need to change to give us "the biggest bang for the buck." They will aggressively continue to examine repair processes from organization, through depot, and back to unit supply and

change processes that create nonproductive maintenance time. The team will then develop various models for field site improvement teams to use to work the problems.

Ron Truesdell, director for supply policy in ODCSLOG, is executive agent for the stockage determination process improvement team. Ron and his team defined stockage determination as "stocking the right parts in the right place to ensure uninterrupted logistics support." Their initial effort was to validate the need for "pockets of inventory," such as authorized stockage list items, prescribed load list items, and bench and shop stocks. They subsequently shifted their focus to alternative stockage approaches. The team determined that changing the current stockage policy would require developing an effective transition-to-war system. The optimum stockage requirements analysis program (OSRAP) was found to be an outstanding decision-support tool to assist logisticians in deployment planning. OSRAP can be used to quickly and effectively determine stocks required to support contingency operations. The team is now developing a mission statement centered on three main concepts—first, move to a systems approach for determining stock position; second, improve performance metrics; and, third, ensure support for the transition to war.

The VM team has come a long way in a relatively short time; and its successes are due in no small part to the commitment of Department of Defense logisticians to provide quality support to our field commanders. I commend those of you who are participating in this vital logistics program. While we made a lot of progress over the past year, we still have a lot to do this coming year.

The VM team will continue efforts to achieve further reductions in OST processes and design and implement improvements in the repair and stockage processes. This coming year the team will expand its goals to include improvements in logistics financial processes. The VM team will work toward its premise of crafting a customer-focused logistics system by—

- Tailoring a responsive, reliable, cost-effective logistics system that supports field commanders.
- Eliminating "drivers" in logistics processes that create poor performance.
- Reducing variability in logistics processes.
- Reducing OST cycles for continental United States high-priority requisitions to 7 days and for oversea high-priority requisitions to 15 days.
- Integrating all logistics activities into a cohesive continuum that focuses on supporting the combat commander.

The VM team uses time, quality, cost, and weapon systems availability as measures of effectiveness for the logistics system. So far, time has been the primary metric used in initial analyses; because time is easily understood and documented in current data systems. This year, the team will explore how to capture and incorporate the other metrics into the analyses.

I challenge each of you in the logistics community to continue your commitment to objectives of the VM program. I also encourage you to continue providing my staff and VM team representatives with your good, innovative ideas; for it is those ideas that help us mold an improved logistics system for the future. ALOG

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Major General Thomas W. Robison commands the Army Combined Arms Support Command and Fort Lee, Virginia. He is also Deputy Commanding General for Combined Arms Support, Army Training and Doctrine Command, Fort Monroe, Virginia. Early last year, he was tasked by the Deputy Chief of Staff for Logistics, Department of the Army, to lead the Army's implementation of velocity management precepts. General Robison graduated from the University of Georgia in Athens and holds a master's degree from Tulane University, New Orleans, Louisiana. He is also a graduate of the Armed Forces Staff College and the Army War College. He is chairman of Army Logistician's *Board of Directors.*

Log Internet

by Colonel Merle D. Russ

We have the tools readily available today to replace our existing industrial-age automated systems with a Force XXI capability that will be compatible with our information-age Army.

Sergeant First Class Payton wasn't having a good day. In fact, he hadn't had many of those since his division had deployed to Croitania. It seemed that the weather, the constantly changing mission, and the extended support lines to home station had all been concocted to make life miserable for the motor sergeant of Bravo Company, 1/36th Armor. Now, trying to bring order to the pile of equipment just unloaded from his HMMWV [high-mobility, multipurpose, wheeled vehicle], he discovers the torn carrying case and crushed remains of what had been the InterLog computer. "Great," he thought. "As if I didn't have enough problems after last night's move! Whose bright idea was it, anyway, to practice a no-notice displacement of the combat trains?" Swearing under his breath for the umpteenth time that morning, he yells to Private First Class Harper, "Take this broken equipment back to the FSB [forward support battalion] and swap it out!"

When the replacement InterLog computer arrives, Sergeant Payton unzips the top of the carrying case and reaches for the power switch. "I don't think the battery is charged, Sarge," Harper tells him. "They told me that they have been turning these things around a lot lately and haven't had time to download any InterLog files. This one just has the basic stuff." Payton plugs in the power cord. The internal charger would refresh the nickel-metal hydride battery in about an hour—probably less time than it would take him to make an InterLog connection and download a files replenishment.

The hard disk drive clicks and hums as the screen comes to life. Payton watches the boot-up messages flash past until the blue-bordered dialog window appears: Enter Your URL Address. *He types* http://milnet.eucom.army/b.1.36ar *in the open box below the message and strikes the* Enter *key. Another dialog window appears:* No User Files Available for Your URL Address. Do You Want to Refresh? *Payton reaches across the table for the SatCell phone. He presses the power button on the keypad and opens the data port on the back of the palm-sized instrument. After snapping in the connector from the InterLog communications port, he thumbs the mouse arrow over the* Yes *box and clicks the left mouse button. Another series of dialog windows appears and is replaced as the computer's modem dials 001-500-8797, the international number assigned to the InterLog server network. "Finally!" he sighs, as the InterLog home page messages appear on the screen.*

Payton pours a cup of coffee from his thermal bottle and watches the new dialog window build until the message appears: Total File Transfer: 1462978k bytes. Estimated Transfer Time: 71 minutes. Do You Want To Continue? *He mentally calculates the SatCell phone bill: "Seventy-one times $8 per minute equals $568. This will probably get us another lecture from that bean-counting battalion S4 [supply officer]. What the heck," he says aloud, as he hits the* Enter *key.*

One of the hallmarks of an industrial-age Army has been the regimented hierarchy of the chain of command. From Napoleon's Grand Armée to the Allied Coalition in the Persian Gulf War, information moved from the company level to the corps level and upward in a fixed path that followed authority lines. Combat service support (CSS) operations followed this same command and control paradigm, and today's CSS automated systems still reflect this ancient heritage. Supply requests, for example, must be passed through numerous layers from company through division to corps. And, like the oral field orders in Napoleon's army, the requests are subject to delay and misinterpretation at each echelon. The request must be passed along its entire route before it can be filled. That is an industrial-age system at work.

The hallmark of the information age is the network rather than the vertical hierarchy. A network allows information to flow from point to point, bypassing nodes that do not need to process the information. The network is intelligent enough to know what information is located where and how to route information requests accordingly. This is a knowledge-

based system at work.

The Internet model offers an example of what our CSS automation could be. Why not have a knowledge-based system that routes a supply request directly to where it can be filled, in a real-time, interactive fashion? (Some will point out that the objective supply capability [OSC] already does this. It does, but only to a certain extent. A supply transaction of record must still be processed through the old hierarchy of systems to establish an audit trail, post inventory records, and process financial data. OSC was probably the first glimmering of the information age in CSS automation, but OSC is to the logistics Internet what a crossbow is to a carbine.) Why not have a single transaction automatically update other logistics information, ranging from the transportation data base that tracks cargo shipments to the procurement authority that will provide the replacement inventory?

Preparing for the 21st Century

The Army is already moving in this direction under Force XXI, the Army's initiative to transform itself into a better, more capable force prepared for the challenges of the early 21st century. On the leading edge of the revolution in military affairs, Force XXI will take our Army from the industrial age to a knowledge- and capabilities-based information-age Army. This transformation is not just another force modernization; rather, it is a quantum leap in doctrine, organization, and capabilities based on the revolutionary breakthroughs in technology that we have only begun to experience.

The campaign plan for Force XXI is a radical departure from our traditional approach to change. We designed Division 86 and the Army of Excellence in the 1980's using the concept-based requirements system, in which battlefield deficiencies in our doctrine drove the development of materiel fixes. That was a "necessity is the mother of invention" approach, although some critics suggested that we often reformulated doctrine merely to accommodate "whiz-bang" new systems. They referred to these new technology-based weapons as "materiel solutions in search of battlefield deficiencies." In truth, we wanted our doctrine to be the engine of change in technology. Using the iterative processes of experimentation and concept demonstration, Force XXI offers a synergistic blending of new ideas and new technology. This experimental environment eliminates all constraints on where one can go with new ideas.

Clearly, Force XXI will lead us to remarkable innovations in all the battlefield operating systems. In CSS, we need to continuously explore new ideas and apply new technology in systems automation. In the past two decades, we have come a long way toward applying the power of the microchip to our CSS systems. Although for many years we used computers merely for automating our manual systems, we have finally begun to question existing standards and to reengineer some of our business practices to take advantage of the capabilities of new computer hardware, software, and communications links. Additionally, under corporate information management initiatives, we have begun to tackle the seemingly endless bog of single-function, stovepipe systems.

Redesigning CSS Automation

Along with the other military services, our Army is planning a consolidation strategy to squeeze the existing assortment of CSS systems into a smaller number of multifunctional systems. But we have not gone far enough in redesigning our CSS automation. We have the tools readily available today to replace our existing systems with a Force XXI capability that will be compatible with our information-age Army. We need to move beyond the incremental, evolutionary path that has been the linchpin of our modernization efforts in the past and embrace the opportunities of the Force XXI initiative. We need a strategy that eventually abandons our legacy CSS systems and, instead, builds a logistics Internet.

Capitalizing on Commercial Technology

All of the technology described in the Payton vignette is already in use or will be available in the next 5 years. Most laptop computers today have more than 60 times the processing speed and memory of those in the cockpit of the National Aeronautics and Space Administration's space shuttle orbiters, whose onboard systems were designed in the 1970's. Many commercial on-line computer services, such as Prodigy, no longer bother to mail updated connection software to their subscribers. Instead, whenever a subscriber logs on, the server checks the version number of the software in use and, if it is obsolete, automatically downloads an update. At last count, 16 companies worldwide were preparing to launch some version of a satellite-based cellular telephone system, with the first networks scheduled to begin service soon. Several telephone companies in the United States offer subscribers a 1-500 number that will route incoming calls to any telephone at any location the subscriber designates. What else will appear in the next 5 years that could be adopted to enhance our CSS automation? To quote retired General Gordon R. Sullivan in a classic "Yogi Berra-ism," "We don't know what we don't know."

Probably the biggest obstacle to the Force XXI campaign plan is the shrinking Defense budget, particularly in research and development. That reduction

makes Army adoption of existing commercial, off-the-shelf technology an imperative. In 1994 the Army Science Board was tasked to conduct a study of technical architecture standards for command, control, communications, computers, and intelligence (C^4I). Among the board's recommendations—subsequently approved for implementation—was the use of a common set of technical standards for all Army automation. In the near term, the board recommended that the Army adopt the commercial Internet standards. The Internet represents a treasure trove of software, communications link designs, and standard computer screen formats that are available to our Army at little or no development cost.

Captain Susan Westlake leans back in her chair and rubs her eyes. Her snapshot readiness report of M1A2 tanks to the division G4 and the DISCOM [division support command] commander last night had set off a flurry of interest in laser range finders. Apparently, the lingering morning fog so typical of the fall weather in Croitania was having a dramatic effect on the division's tank fire-control systems. The rebels had a pattern of moving to new positions on the opposing ridge lines every night. Starting in the predawn hours, the tank gunners would lase the new rebel positions repeatedly through the dense morning fog to establish range data. As a result, almost 25 percent of the division's M1A2's had burned-out range finders

For over half an hour, Westlake had followed hypertext links on the InterLog from the PEO [Program Executive Officer] Armored Systems home page to various locations where she could check on the supply availability and the transportation status of laser range finders. She looks again at the screen and marvels at what she sees. She is on the home page of the Mounted Warfare Battle Lab on the Army Infonet. There, among the "What's New" items, is a training advisory on using laser range finders in obscured visibility conditions. At the end of the advisory is a blue-colored text passage that reads, USMATCOM Field Fix for M1A2 LRF. *Clicking on the highlighted text, she watches the screen load the* U.S. Materiel Command Ground Forces Readiness *page. Clicking on* M1A2 LRF, *she opens a three-page brochure with color photographs of how intermediate maintenance units can modify the A-3 circuit card in the laser range finder to prevent continuous gunner engagements longer than 1.5 seconds.*

Westlake clicks open the Options *menu on her screen's tool bar and opens the* Save to Disk *option. The hard disk drive clicks and hums as the brochure is downloaded. Opening the e-mail shell, Westlake attaches the brochure to a note addressed to her materiel readiness group. Within minutes, the modification brochure would be available to the leaders of the fire-control repairers throughout the division.*

Department of Defense sites are appearing more and more frequently on the Internet, especially on the popular World Wide Web. In this multimedia environment, military activities place a wealth of information on the Internet in an easily accessible format. The World Wide Web is a lengthy series of Internet file locations linked by a simple protocol called hypertext markup language, or *hypertext*, as it is commonly called. Hypertext links allow a user to jump from one file location to another by clicking the computer's mouse pointer on a key word or series of text. Information can be retrieved from wherever it is stored without the user knowing where it can be found. For example, the Army has a home page, or main menu, on the World Wide Web. From there, a user might begin a search of the Force XXI Infonet site and find the information he needs at the Naval Postgraduate School site or perhaps at the Library of Congress site.

The World Wide Web is a knowledge-based network. It replaces older versions of Internet systems that were based on rigid, hierarchical menus. Its applicability to combat service support data bases is immediately obvious. It's easy to see how we could replace our supply, maintenance, and transportation standard Army management systems (STAMIS) with a single Internet-style network.

The future offers two different courses of action for CSS automation. We can continue our current strategy, spending millions of dollars maintaining legacy systems and developing newer, industrial-age systems with their associated unique hardware and batch communications links, or we can tap into the existing, proven capabilities of the Internet and leap forward to the information age. Only our imagination limits what we can accomplish. **ALOG**

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AHC Passes 'Smart Card' Test

by Glenn R. Maravillas and Herbert R. Andresen

The success of an automated headcount test using smart card technology will lead to eliminating paper meal cards throughout the Army.

Where can soldiers go for the ultimate food service experience? Hawaii, of course! That's because the 25th Infantry Division (Light) and U.S. Army, Hawaii (USARHAW), are the only units in the Army using automated headcount (AHC) and the multitechnology reader card (MARC).

Approximately 18,000 soldiers assigned to the Hawaii units participated in a prototype test of AHC in which they used the MARC as a substitute for the regular meal card. AHC is the Army's first application of "smart card" technology and eventually will eliminate the paper meal card. Although other functions—including field medical documentation, mobility processing, manifesting, composite health care patient reception, and personnel accountability—are part of a 2-year Department of Defense MARC test, AHC is the first complete and successful use of the MARC.

MARC

The MARC is a plastic "credit card" issued to each soldier that contains his photo, name, rank, branch of service, status, date of birth, blood type, and other distinctive information. It has three data storage mediums: bar code, computer chip, and magnetic stripe.

AHC uses the magnetic stripe on the back of the MARC to collect headcount data at dining facilities. This stripe contains the soldier's name, social security number, unit identification code (UIC), meal entitlement code (MEC), and expiration date. The magnetic stripe permits easy modification of frequently changing personal data such as UIC and MEC.

AHC Prototype Test

The prototype test had two phases. In the first phase, which began in August 1994, hardware and software were installed and food service personnel and personnel administration center (PAC) staff were trained on the new equipment and procedures. Information Technology Solutions, Inc., of Petersburg, Virginia, under contract with the product manager for the Army food management information system (PM AFMIS), trained 90 food service workers from 12 dining facilities and 37 PAC employees.

The training was given in two sessions. The first session, which was confined to the 125th Signal Battalion at Helemano, Hawaii, refined procedures for issuing the MARC and installing AHC software and hardware. Personnel administering the test conducted diner and management surveys and collected performance data about AHC software, hardware, and procedures. Lessons learned from the first training session provided useful information for the second session, when the rest of the division and USARHAW food service and PAC employees were trained.

The second phase of the test was the actual AHC prototype test at Schofield Barracks during January 1995. The objectives of the test were to—

- Eliminate the need to issue, manage, and control meal cards.
- Eliminate paper forms in 95 percent of the headcount transactions.
- Provide a payroll deduction option for the diner receiving a basic allowance for subsistence (BAS).
- Reduce the potential for fraud, waste, and abuse.
- Provide an accurate method of identifying each diner's meal entitlement (subsistence in kind, BAS, or BAS with surcharge).
- Reduce the time required to process diners through the headcount station.

The headcounters at each dining facility served as the main testers of AHC. They operated a handheld computer called a portable data collection device (PDCD), a commercial off-the-shelf item made by Telxon, Inc. Diners handed their MARC to the headcounter, who verified the holder's photo on the card and scanned it through the PDCD.

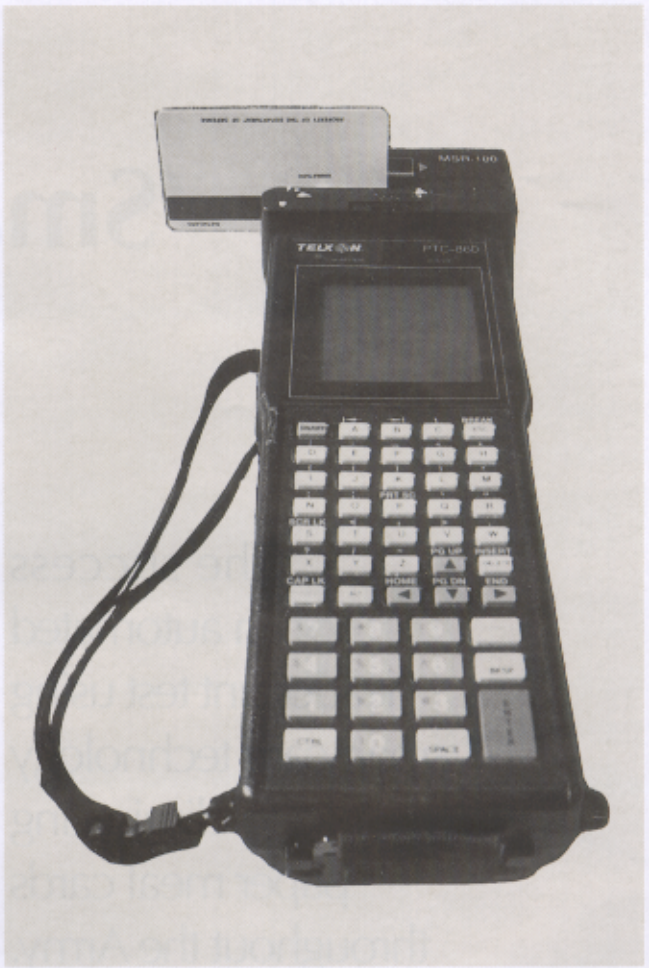
The PDCD reads each diner's status and MEC to determine the correct cost of the meal. The basic information recorded by the PDCD includes the first five characters of the diner's last name, the diner's social security number, meal type, payment method, and amount paid. Recording these data electronically eliminates the need to collect signatures from MARC holders at the headcount station and reduces the paperwork required to collect headcount data.

The PDCD keeps an up-to-the-minute record of diners served and cash collected. It also compiles summary information that speeds up post-meal accounting.

The PDCD transmits data collected to the AFMIS 3B2 minicomputer after each meal. However, the PDCD has sufficient memory capacity to store information on multiple meals should the AFMIS system be inaccessible or inoperable.

Payroll Deduction Option

AHC gives the BAS diner the option of paying for his meal with cash or by payroll deduction. If the diner chooses the payroll deduction option, the headcounter hands the diner the PDCD, and the diner enters a four-character personal identification number (similar to a transaction at a bank's automated teller machine). Payroll deduction data are sent through the Defense Data Network to the Defense Finance and Accounting Service for entry into the Defense joint military pay system-active. Payroll deductions posted before the 15th of the month appear on that month's leave and earnings statement (LES). Payroll deductions made after the 15th of the month appear on the next month's LES.



Test Findings

BAS diners liked the payroll deduction option. The number of BAS diners selecting payroll deduction (as a percentage of the total number of BAS diners) increased as the number of dining facilities on AHC increased. By 31 January 1995, approximately 28 percent of BAS diners in Hawaii were using the payroll deduction option. As a result, the amount of cash handled in the dining facility was substantially reduced.

AHC reduces the potential for fraud, waste, and abuse by identifying attempts to use MARC's more than once for a particular meal and by identifying MARC's with overridden meal entitlement codes. AHC prints this information on an exception report for review by the installation food advisor, who notifies commanders of abuse of the system by diners in their units. In addition, AHC identifies use of a lost or stolen MARC. When the installation food advisor receives a report of lost or stolen MARC's, he sends the holder's name and issue date of the MARC to the

After verifying the soldier's photo on his MARC, a headcounter scans the card through a handheld computer called a portable data collection device (PDCD) (left). After each meal, the data collected by the PDCD are transmitted to the AFMIS 3B2 minicomputer (above).

AFMIS system administrator, who enters the data into AFMIS. AFMIS then prints out any use of the card on the exception report.

The results of the prototype test are overwhelmingly positive. AHC reduces the processing time at the headcount station for a subsistence-in-kind diner from 11 to 6 seconds; for a BAS diner from 23 to 9 seconds.

Next Step

The AHC data elements will transfer from the magnetic stripe to the microchip on the MARC, using current state-of-the-art technology. This will standardize the MARC data readers and writers, consolidate data elements for all MARC applications onto the chip, and eliminate the need for the magnetic stripe encoders.

The Office of the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence, proponent of the MARC test, anticipates approval to field the MARC throughout the Department of Defense (DOD). Automated headcount will be provided to the remainder of the Army in accordance with the DOD's MARC fielding plan.

Soldiers have to eat three times a day, 365 days a year. AHC uses the most modern technology available to provide quick, hassle-free dining service to the soldiers while realizing a substantial resource savings for the Government. ALOG

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Logistics—Sometimes the Main

When preparing plans and orders for military operations other than war, it may be appropriate to consider logistics as the main effort to be supported.

The Army defines military operations other than war (MOOTW) as "military activities during peacetime and conflict that do not necessarily involve armed clashes between two organized forces" (FM 100-5, Operations). The Government continues to send soldiers to perform this "nontraditional" role. I want to address the logistics implications and the "command logistics perspective" in MOOTW situations.

I have written previously in *Army Logistician* on the equivalent nature of logistics ("Equivalent Theory of Logistics," January-February 1995) and have criticized the shortsighted view the Army traditionally takes when defining logistics in the study of warfare. The same reasoning applies, perhaps more so, in the conduct of MOOTW. The command logistics perspective must guide the MOOTW force commander in many circumstances.

I recently attended the Armed Forces Staff College in Norfolk, Virginia, where one of the joint staff student exercises was to plan a disaster relief effort in support of a developing nation. The scenario depicted half a million displaced civilians in need. Insurgents in the joint operations area posed a considerable threat to relief efforts in the region.

The exercise required the joint staff students to develop courses of action in accordance with joint operations planning and execution system (JOPES) requirements and to present a concept of operations decision briefing to the regional commander in chief (CINC). We followed the five-paragraph operations plan format to develop the CINC's concept of operations—

1. *Situation.*
2. *Mission.*
3. *Execution.*
4. *Administration and logistics.*
5. *Command and signal.*

What was remarkable about the exercise was the failure of the students and faculty to recognize what should have been the *main effort*. The students squarely faced the difficulty imposed by the security versus humanitarian relief dilemma. They stated in paragraph 2 (mission) that security and humanitarian relief were the operational objectives. Both the written product and subsequent decision briefing presented security as the main effort in paragraph 3 (execution). Paragraph 4 (administration and logistics) was presented as the support plan to distribute relief supplies and medical and civil engineering services.

I was the only logistician in the joint staff group. In the after-action review conducted by the students and faculty, I suggested that paragraph 3 should have been devoted to the logistics concept to provide humanitarian aid. I felt that logistics (including civil engineering) was the operational main effort, while security, communications, and intelligence were supporting efforts. I felt that paragraph 4, on the other hand, should have reflected the internal administration and logistics required to support the force, not the displaced civilians. Other members of the joint staff group felt that this was a debatable, bureaucratic point, not worthy of further discussion.

Wrong! I believe the point I made was an important leadership point, not bureaucratic trivia. Simply stated, the plan we developed had one great flaw: a glaring mismatch between the mission and the concept of operations. In effect, the mismatch was in conflict with both joint and Army doctrine, which recognize the need to support other than Department of Defense agencies and the role of administrative support in accomplishing our national objectives.

The "command logistics perspective" is often the cornerstone of the commander's intent and concept of operations. I am not suggesting that we turn over humanitarian assistance, disaster relief, and support of

Effort in MOOTW

by Lieutenant Colonel Christopher R. Paparone

domestic civil authorities to a logistics commander (although this may be appropriate in some cases). Rather, I believe the appointed commander must train his staff to be less "stovepiped" in the plans and orders process.

For example, in MOOTW, understanding the capabilities of reverse osmosis water purification units (ROWPU's) and mortuary affairs teams may be more important than directing the operations of a light infantry battalion. MOOTW must be organized and planned around mission main efforts, and the command and control headquarters must be staffed and funded accordingly.

During MOOTW predeployment activities and deployment operations, it may be necessary to go "logistics and movement control heavy" in the emergency operations center. The main tasks in the crisis action planning phase may be to determine logistics requirements and compare them to the logistics units' capabilities. For example, should we send a mobile Army surgical hospital or a combat support hospital to care for 100 anticipated surgical patients? How many tons of bulk food could be transported 144 kilometers by a light-medium truck company? Does that company have materials-handling equipment? Should we airdrop food instead of distributing it on the ground? Could the Navy use its logistics over-the-shore capability to assist a coastal population in need?

The incountry joint task force operations center also may be "logistics heavy," with a supporting communications hierarchy designed to command and control a number of logistics units and, if necessary, contractors. Intelligence efforts may be influenced by the host nation infrastructure (or lack of) and the willingness of host nation political leaders to provide basing, overflight, and other logistics support. A Navy warship may be required to purify water or provide medical support and electricity to a coastal community. A large-scale civil engineering project may be needed to provide land lines of communication to a supported foreign internal defense effort.

I believe our service and joint doctrinal planning procedures are sound and our staff expertise is sufficient. Changes need to be evolutionary, not revolutionary. In pursuit of process improvement, we need to consider how to best "exploit" the expertise and channel the main effort to help the commander make sound decisions.

While working in the G4 section of the XVIII Airborne Corps command post in Saudi Arabia from early August 1990 to March 1991, I could hardly grasp the enormity of the logistics endeavor we were undertaking. However, I intuitively knew that the parochial, "stovepiped" Army command and staff structure was not providing optimal support to the main Desert Shield task at hand. Contrary to commonly held perceptions, Desert Shield was a MOOTW. It was unlikely that Saddam Hussein would attack Saudi Arabia, so the focus of military activity before hostilities occurred should have been on force buildup. Unfortunately, most of the command and control structure was oriented toward something other than the main effort.

I had to come to grips with the role logistics commanders and staffs were called to play in supporting the misdirected intentions of the theater. The efforts of our command, control, and communications assets should have been focused on the desired logistics end state. Instead, because of their branches and positions, the logistics specialty staff officers had to operate in supporting rather than supported positions. Had we correctly directed the commanders and staffs at all levels toward the true main effort, we would have had more efficient and effective operations before and during the ground offensive.

What Army doctrine does fail to recognize is what Rear Admiral Henry E. Eccles called "command logistics perspective" (*Logistics in the National Defense*). This perspective is especially pertinent to planning and conducting MOOTW. Unless we properly focus the use of our scarce military resources on the main effort, we jeopardize support of our more pressing wartime needs. We must recognize that command logistics may sometimes override the traditional combat orientation of commanders and staffs. It may be appropriate to include logistics in paragraph 3 (execution) of our MOOTW plans and orders as the main effort to be supported. **ALOG**

Lieutenant Colonel Christopher R. Paparone, a Quartermaster Corps officer, is commander designee of the 47th Forward Support Battalion, Baumholder, Germany. He has served in a variety of logistics staff positions, including 193d Support Battalion operations officer in Operation Just Cause; XVIII Airborne Corps G4 plans officer during the Gulf War; and battalion executive officer, 82d Airborne Division. He is a graduate of the College of Naval Command and Staff at the Naval War College, Newport, Rhode Island; and the Armed Forces Staff College, Norfolk, Virginia.

ULLS Aids Materiel Readiness Reporting

by Nicholas L. Flaim

Unit commanders will be able to compile and send materiel readiness reports in minutes instead of spending hours filling out DA Form 2406.

The days of calculating numbers and filling out Department of the Army (DA) Form 2406, Readiness Report, are about to end. You can say goodbye to stubby pencils and calculators and say hello to the Army materiel status system (AMSS), a subsystem of the unit level logistics system (ULLS).

The AMSS consists of a number of software processes that will collect, compile, and report materiel readiness information for ground, missile, and aviation equipment in Army units. ULLS is a tactical standard Army management information system (STAMIS) that is being fielded at company level throughout the Army. With the addition of AMSS processes, ULLS will perform all of the time-consuming and tedious calculations needed to produce feeder information for readiness reports.

ULLS Applications

As product manager for ULLS (PM ULLS), I am responsible for the development, acquisition, and fielding of ULLS and receive guidance from the program manager, integrated logistics system. Our offices are located at Fort Lee, Virginia.

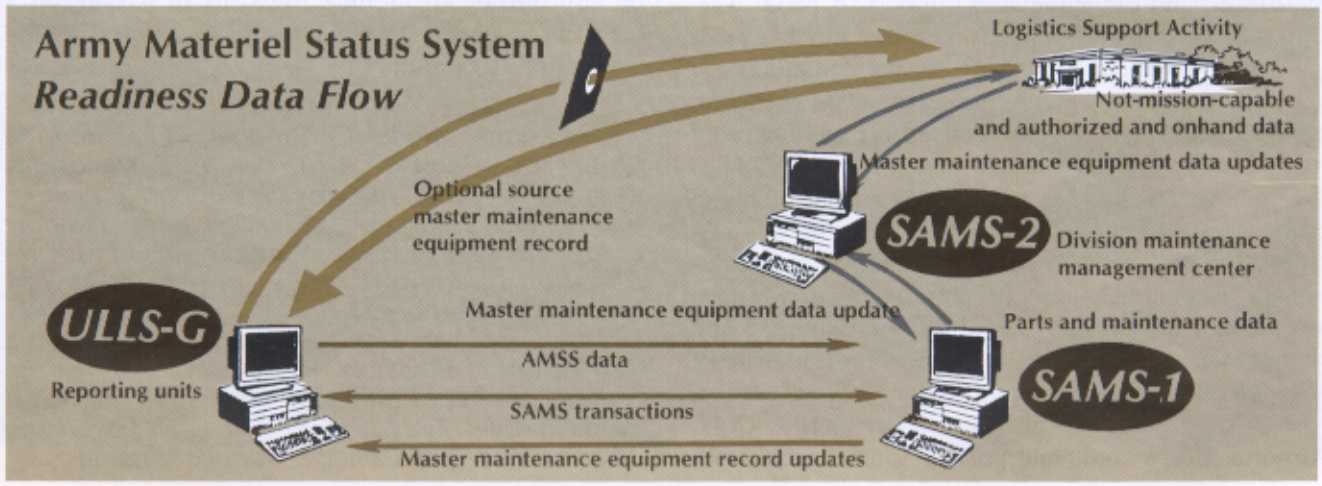
ULLS consists of three incrementally developed applications: ground, aviation, and S4 (supply officer). The ground application (ULLS-G) is used in unit motor pools at approximately 6,900 locations. Aviation unit and intermediate maintenance and flight companies use ULLS-aviation (ULLS-A). Currently, ULLS-A is in use at the 1st Armored Division in Bad Kreuznach, Germany; the 1st Cavalry Division at Fort Hood, Texas; and the Maryland, Virginia, and District of Columbia National Guards. ULLS S4 operates in brigade and battalion S4 sections and company supply rooms. ULLS-S4 is now in use at six brigade-sized prototype sites. It is scheduled for milestone III review in fiscal year 1996.

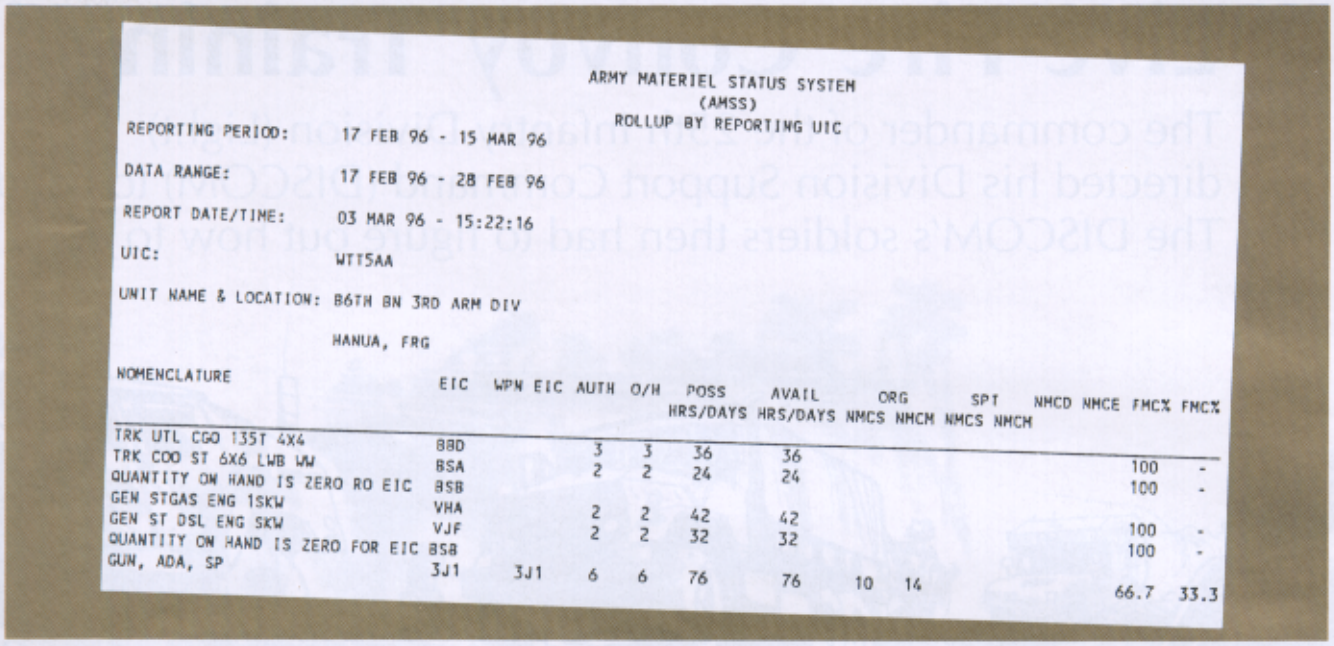
How ULLS Works

AMSS is part of software change package 05 to the ULLS-G application; its use is governed by Army Regulation (AR) 700-138, Army Logistics Readiness and Sustainability.

As a routine business process, ULLS-G will collect downtime data at the organizational level. The standard Army maintenance system (SAMS) will send information on equipment downtime associated with direct support supply actions. ULLS can then calculate total downtime on equipment in a unit. Using these downtime data, AMSS processes within ULLS-G will calculate not-mission-capable maintenance (NMCM), not-mission-capable supply (NMCS), and fully mission-capable (FMC) times.

To generate materiel readiness reports, ULLS-G





ARMY MATERIEL STATUS SYSTEM
(AMSS)
ROLLUP BY REPORTING UIC

REPORTING PERIOD: 17 FEB 96 - 15 MAR 96

DATA RANGE: 17 FEB 96 - 28 FEB 96

REPORT DATE/TIME: 03 MAR 96 - 15:22:16

UIC: WTT5AA

UNIT NAME & LOCATION: B6TH BN 3RD ARM DIV

HANUA, FRG

NOMENCLATURE	EIC	WPN EIC	AUTH	O/H	POSS HRS/DAYS	AVAIL HRS/DAYS	ORG NMCS	ORG NMCM	SPT NMCS	SPT NMCM	NMCD	NMCE	FMC%	FMC%
TRK UTL CGO 13ST 4X4	88D		3	3	36	36							100	-
TRK COO ST 6X6 LWB WW	BSA		2	2	24	24							100	-
QUANTITY ON HAND IS ZERO RO EIC	BSB													
GEN STGAS ENG 1SKW	VHA		2	2	42	42							100	-
GEN ST DSL ENG SKW	VJF		2	2	32	32							100	-
QUANTITY ON HAND IS ZERO FOR EIC	BSB													
GUN, ADA, SP	3J1	3J1	6	6	76	76	10	14					66.7	33.3

This report shows readiness data for all systems and reportable end items. It can be run anytime during the reporting period for a unit or used as a rollup by a reporting battalion.

will also use data from the maintenance master data file (MMDF) and unit authorization file. The MMDF, maintained by the Army Materiel Command's Logistics Support Activity (LOGSA) at Redstone Arsenal, Alabama, lists all reportable and nonreportable equipment. LOGSA will forward the MMDF through SAMS to ULLS. The unit authorization file identifies the number of end items authorized and on hand in a unit. ULLS users must now create the file manually. Ultimately, ULLS S4 will create the file from information provided by the standard property book system.

Versatility of ULLS

With standard change package 05, unit commanders can compile and send materiel readiness reports in minutes instead of the hours previously expended in compiling DA Form 2406 feeder reports. After compiling materiel readiness rates, ULLS-G will forward them electronically through SAMS to LOGSA. Readiness data flow from ULLS-G to LOGSA is depicted in the chart at left.

AMSS will be the single materiel status reporting system in the Army. For ULLS-G users, AMSS replaces DA Form 2406 and DA Form 3266-1, Missile Materiel Readiness Report. These reports provide feeder information to the unit status report under AR 220-1, Unit Status Report.

ULLS will provide commanders a variety of reports. For example, at any time, ULLS can project fully mission-capable rates to the end of the reporting period. This report provides commanders and managers the opportunity to review and react to readiness data before reporting to the national level. Other reports include the class IX (repair parts and components) failure data by administration number; equipment exception reports; and not-mission-capable reports. The report above is an example of an AMSS rollup by unit identification code.

Technical tests of ULLS-G software change package 05 were completed at Fort Lee in April 1995, and user testing was completed in August 1995. We expect to train and release software change package 05 to all users this quarter of this fiscal year.

AMSS processes within ULLS will improve the accuracy of materiel readiness reports and save time for users and managers. To learn more about AMSS, check out the video titled, *Army Materiel Status System* (A0512-93-0142), available from local Army training and audiovisual support centers. This video provides an overview of AMSS to acquaint users with the Army's new materiel readiness reporting system.

Nicholas L. Flaim has been the product manager for ULLS since December 1989. He is a charter member of the Army Acquisition Corps and a graduate of the Defense Systems Management College's Program Management Course. Mr. Flaim has a bachelor's degree in psychology from Saint Leo College, Florida, and master's degrees from Marywood College, Scranton, Pennsylvania, and Virginia State University, Petersburg, Virginia.

Live-Fire Convoy Training in

The commander of the 25th Infantry Division (Light) directed his Division Support Command (DISCOM) to conduct The DISCOM's soldiers then had to figure out how to do it.

Hawaiians call the island of Oahu "The Gathering Place." The soldiers of the 25th Infantry Division (Light), who are based at Schofield Barracks on Oahu, refer to the live-fire range at Makua Valley Military Reservation, on the island's western shore, as "Death Valley." Soldiers of the Division Support Command (DISCOM) "gathered" at "Death Valley" in June 1994 to execute the division's largest known convoy live-fire exercise. Their goal was to train for the largest casualty-producing and equipment-disabling mission that support soldiers can expect to undertake: the convoy.

The division commander, Major General George Fisher, directed the DISCOM, under Colonel Dennis Jackson, to execute the convoy live-fire operation. The DISCOM, in turn, tasked the 225th Forward Support Battalion (FSB), commanded by Lieutenant Colonel Keith Kernek, to carry out the mission. The 225th was chosen because it was part of the 2d Infantry "Warrior" Brigade Task Force, which was already training for an August rotation at the Joint Readiness Training Center (JRTC) at Fort Polk, Louisiana.

But there was a problem. The units taking part in the exercise had little or no convoy training, and the units and soldiers within the DISCOM had never before attempted a live-fire exercise of this magnitude.

The inexperience of the division's units in live-fire convoys was not unusual in the Army. The mission essential task lists (METL's) of most of the Warrior Task Force units scheduled to deploy to the JRTC included some form of vehicular movement. However, observations of past unit performances at the JRTC indicated that tactical convoy training did not receive enough emphasis during unit field training exercises. General Fisher, who had been commander of the JRTC before taking over the 25th Infantry Division, was well aware of these findings and determined to correct the deficiency for his command. So he ordered task force units to attain a trained status for vehicular movement battle tasks before deploying to Fort Polk.

Planning

Many collective, leader, and individual tasks are involved in a multiunit convoy. The officers and noncommissioned officers (NCO's) detailed to train their units for the live-fire convoy exercise focused on factors that they considered critical for success.

After weighing their soldiers' inexperience at live-fire convoys, the exercise planners decided that the DISCOM's units would have to prepare for the exercise in a careful, methodical fashion—in essence, learning to crawl before they could walk. The units also would have to synchronize with each other on all operating procedures, and—essential to the operation's success—they would have to be conscious of

Hawaii

by Captain Geoffrey C. DeTingo

a convoy exercise under live fire.

safety at all times.

The first planning session for the exercise included representatives of all participating units. In an open forum designed to identify issues and concerns, the planners decided to divide the operation into three phases: crawl, walk, and run. The crawl phase would include developing scenarios and a solid DISCOM standing operating procedure. Under the walk phase, the units would work and practice together in field and situational training exercises. The run phase would involve an opposing force (OPFOR) firing blanks, using the multiple integrated laser engagement system (MILES), followed by use of live ammunition at the range.

Crawl Phase

The crawl phase began with the bonding of eight different units from five battalions representing the Ordnance, Quartermaster, Transportation, Medical Service, Chemical, Infantry, and Military Police branches. Representatives from the units met to discuss the range scenario. Since the 25th Infantry Division rarely, if ever, has a unit-pure convoy, the planners agreed that the units would be organized by task and integrated into three 10-vehicle serials. The serials then would work together during the convoy field training exercises with the same infantry battalions that they would later support at JRTC.

After the field training exercises, the convoys would link up at the brigade support area (BSA), operated by the 225th FSB, for scaled, walk-through live-fire rehearsals. After the rehearsals, convoy procedures (with blank and live-fire rehearsals) would be practiced at Makua Valley on two separate occasions.

With a rough scenario agreed upon, the operators identified the convoy commanders who would begin the detailed planning. The convoy commanders, in turn, identified their NCO's in charge (NCOIC's), their vehicles by bumper number, and their personnel by weapon type. Each serial would include 35 soldiers on its 10 vehicles. Each serial also would be accompanied by a Military Police M60 "gun ship" for convoy security, a 5-ton truck carrying a ready reaction force and breach team, and a front-line ambulance.

The range officers in charge, convoy commanders, and NCOIC's then conducted a tactical exercise without troops at the Makua Valley range. They decided that each serial would be halted by a mined wire obstacle. Once the convoy halted, the enemy—represented by pop-up targets, pneumatic M60 machineguns, and an artillery simulator—would initiate an ambush. The convoys would then be forced to dismount, return fire, breach the obstacle, and clear the kill zone.

With the units organized by task and a scenario agreed upon, all the planners needed to do to complete the crawl phase was to develop a common set of standing operating procedures. The transporters of D Company, 725th Main Support Battalion, wrote a consolidated convoy checklist and brief and distributed it to the participating units. Personnel of the 25th Military Police Company provided valuable support by sharing their knowledge of convoy battle drills and road-obstacle breaching techniques. Armed with the basics, the operation then moved into the walk phase.

Walk Phase

On 6 to 8 June, approximately 30 soldiers and 10 vehicles from the 225th FSB partnered with the 1st Battalion, 21st Infantry Regiment (1/21 Infantry Battalion), to execute a smaller convoy live-fire exercise at Schofield Barracks. This was a stepping-stone toward the larger live-fire exercise that was to take place at Makua Valley.

After this preliminary exercise, the convoys continued the walk phase by conducting joint field training with the 1/21 and 4/22 Infantry Battalions. Each battalion was responsible for operating situational training lanes, which would expose the convoys and their infantry dismounts to different types of enemy contact. The purpose of the 4-day exercise was to train and test the units on their battle drills and standing operating procedures. It also gave DISCOM logisti-

cians the chance to work closely with the units they would later support at the JRTC.

Run Phase

The run phase of the mission began when the three convoys linked up at the 225th FSB's BSA, located at Dillingham Army Airfield. Dillingham is on the northwest coast of Oahu, only 3 miles from Makua Valley. But because of the intervening, 2,600-foot-high Waianai Mountains, the only way to get from Dillingham to Makua Valley is over 49 miles of road. The movement to Makua would be part of the overall range scenario. It was treated as a tactical exercise, complete with maps, intelligence briefings, checkpoints, and a MILES-equipped OPFOR along the route. Every aspect of the operation during the run phase, including all rehearsals and movements, was done tactically.

The rehearsals at the BSA were directed by the 225th FSB S3 and were conducted by everyone participating in the live fire. The rehearsal "sand table" was a 50-meter by 50-meter area in the center of the BSA. The main supply routes, checkpoints, suspected enemy positions, and mission objective were represented by colored engineer tape. The S3 controlled the rehearsal by using a synchronized movement matrix. The convoy commanders led their convoys through the sand table as directed by the matrix. After the consolidated rehearsal, the commanders were allowed to use the site to further practice detailed actions.

Early on the morning of 19 June, the commander of convoy 1 received the order to resupply the combat trains located at Makua Valley with all classes of supply. The commander had 3 hours to organize, brief, and rehearse his convoy before his move-out time. Convoys 2 and 3 received their orders 1 and 2 hours later, respectively.

At H+3, convoy 1 departed the BSA, calling in checkpoints through a DISCOM-operated retransmission site. Approximately 1 hour and 45 minutes after the start time, convoy 1 entered Makua Valley, linked up with the range safeties, and issued blank ammunition to its soldiers. Each serial conducted a minimum of four rehearsals on the objective, two walk-through and two with MILES-equipped blank fires. At the completion of each rehearsal, a 225th FSB company commander, acting as an observer-controller (OC), conducted an after-action review.

During the blank-fire rehearsal, the MILES-equipped enemy initiated the ambush 250 meters from the halted convoy. This technique forced the convoy dismounts and breach teams to take cover and place well-aimed fire to suppress the enemy. The OC's had MILES master guns to "MILES-kill" any soldier who was not performing the battle drill correctly or was committing a range safety violation. The OC's and range safeties played an integral part in the operation by constantly observing the range safety restrictions and evaluating the convoys' performance.

The objective of the first day was to train the soldiers to the point that they could conduct the next day's live fire without a rehearsal. With that objective met, the convoys returned to the BSA to refit and prepare for the live-fire exercise early the next day. To further train the soldiers to never take anything for granted, the convoys were surprised with a MILES ambush as they prepared to enter the BSA.

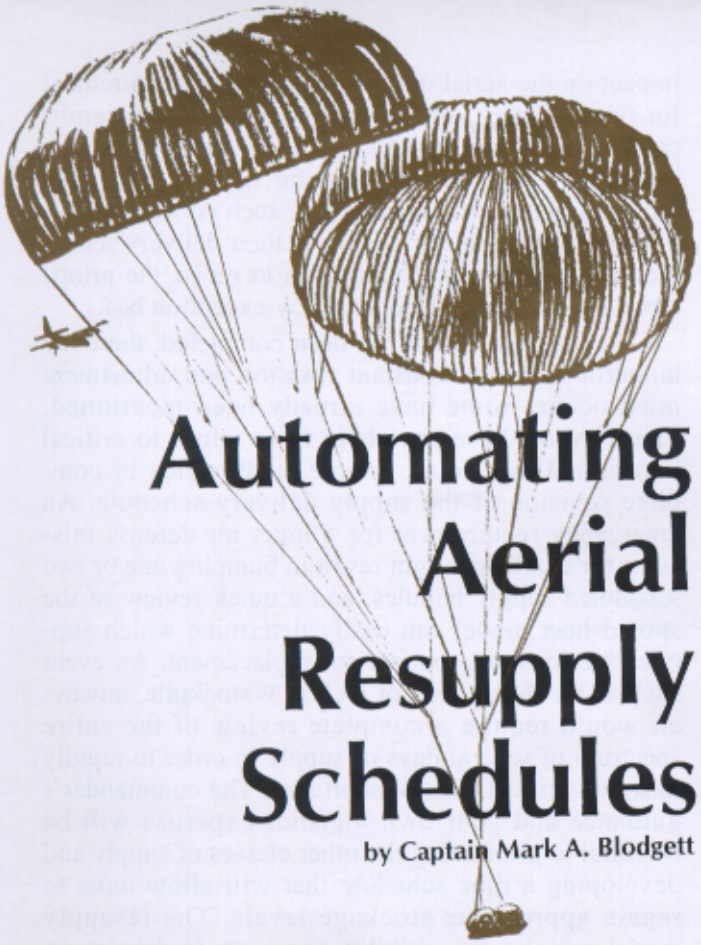
The day of the live fire was the same as practiced during the blank fire, with a few notable exceptions. The convoys would move to Makua Valley, pick up live ammunition, and immediately execute the live fire. Each convoy would execute once, then conduct an after-action review, and repeat the process.

Each iteration was done to standard, the pop-up targets on the objective were suppressed, the obstacle was successfully breached, and there were no injuries on the range. The convoys conducted their final after-action review and moved back to the BSA to begin the redeployment to Schofield Barracks.

Many important lessons were learned during this operation. First, involve NCO's in all facets of a live-fire convoy exercise; their experience and expertise are invaluable to the detailed planning of the mission. Second, make the training as realistic as possible, given the limits of the range safety restrictions. Third, train the soldiers to one standard, be tactical at all times, and do not take any unnecessary short cuts. Fourth, integrate MILES training whenever and wherever possible. Fifth, when training with so many units, make sure there is unity of command and one, final decisionmaker. Finally, the after-action review process is invaluable to achieving and exceeding the standard.

The 25th Infantry Division's first DISCOM live-fire convoy exercise was invaluable to the logisticians who support the brigade task force and to the soldiers and units who would later benefit from their experience. **ALOG**

Captain Geoffrey C. DeTingo is assigned to the 101st Airborne Division (Air Assault) Division Support Command at Fort Campbell, Kentucky. He was assistant S2/3 of the 225th Forward Support Battalion, 25th Infantry Division (Light), Schofield Barracks, Hawaii, when he wrote this article. He is a graduate of the Infantry Officer Basic Course, the Army Ranger School, and the Army Logistics Management College's Combined Logistics Officer Advanced Course.



Automating Aerial Resupply Schedules

by Captain Mark A. Blodgett

Imagine yourself as the logistician for a light infantry brigade task force deployed to a remote area of the world and ordered to conduct combat operations. The mission requires total dependence on aerial resupply. You, as the S4 or support operations officer, must plan and manage the requests for, and delivery and distribution of, the tons of supplies required for the duration of the mission.

After extensive effort in planning the resupply schedule at home station, the first of hundreds of parachutes float to the ground bringing supplies and materiel that will sustain your brigade for the next several weeks. Satisfied that you have completed your mission, you return to the brigade support area (BSA) to find that half of the supplies that landed are unrecoverable, and the S2 reports that weather for the next 24 to 48 hours makes further aircraft support unlikely. As you try to determine the impact of these developments, a mortar attack near the ammunition point destroys the class V stockpiles that you brought in with the initial airflow.

Faced with this turn of events, your brigade's situation may be grim. You, as the logistician, must quickly analyze the current level of supply, levels required for near-term operations, and the resupply schedule that can fill these requirements using the available aircraft delivery assets.

Though the above example is an extreme one, it is by no means unrealistic. Many foreseeable light infantry missions in today's world would require at least initial aerial resupply. Joint Readiness Training Center (JRTC) rotations have required replication of almost exclusive aerial delivery of everything from meals, ready-to-eat (MRE's), to bulk petroleum. The ability to effectively plan an initial aerial resupply schedule and then revise it as necessary once the operation starts is essential. This ability is key to ensuring that maneuver units will be able to conduct their mission without restrictions imposed by logistics constraints. Computer spreadsheets are often overlooked as planning assets in this process, and logisticians should consider them important tools for the complicated task of aerial resupply scheduling.

Aerial resupply is complex and extremely difficult to manage. There are a greater number of components and far more restrictions placed on these operations than in ground resupply because of things like aircraft load limits, types of aircraft, and the increased time lag between request and delivery. The use of aircraft invites a host of foreseeable but unplanned events that can critically impact ongoing operations. Among these are poor weather, maintenance problems, and enemy activity. The impact of such events can range from inconvenient to catastrophic. Because the ground units cannot typically direct multiple flights of aircraft the way they can make multiple convoy trips with organic ground transportation, the logistician's problem turns from where to find more trucks to what supplies can be delayed or eliminated from the delivery schedule.

The variables involved in aerial delivery—stockage level, consumption rate, and delivery rate—can be programmed into a computer to produce a spreadsheet that will provide constant visibility of each. Such a system can be used not only to find solutions quickly but to war-game several solutions before making a decision. A copy of a spreadsheet model developed for use during a brigade task force JRTC rotation appears on page 21. The initial aerial delivery plan was developed using known and assumed levels of initial supply and daily consumption demands. After entering these factors as "givens," the final variable, delivery rate, could be isolated and changed independently until a fully feasible solution for the duration of the mission could be determined. A conditional statement that compared the level of supply on a given day to the daily consumption rate during that day indicat-

ed, with a "true" or a "false," whether or not all demands could be satisfied. "True" indicated that requirements could be met. "False" indicated a shortfall that needed resupply before the day in question for that class of supply.

Before starting the operation, the S4 and the support operations officer entered on the spreadsheet the known or assumed levels of supply and demand for as many classes of supply as possible. For example, on D-day, each unit deployed into the maneuver area with 3 days' supply of MRE's. A "3" therefore was entered on the spreadsheet under "Initial Stockage" for class I. Daily consumption of class I was 1 day of supply (shown as "DOS" on the spreadsheet), so "1" was entered across the spreadsheet for each day of the operation. This value equated to 9,000 meals available daily for distribution inside the brigade area. On days when T rations were scheduled, MRE consumption was listed as .66 days of supply and T ration consumption was listed as .33.

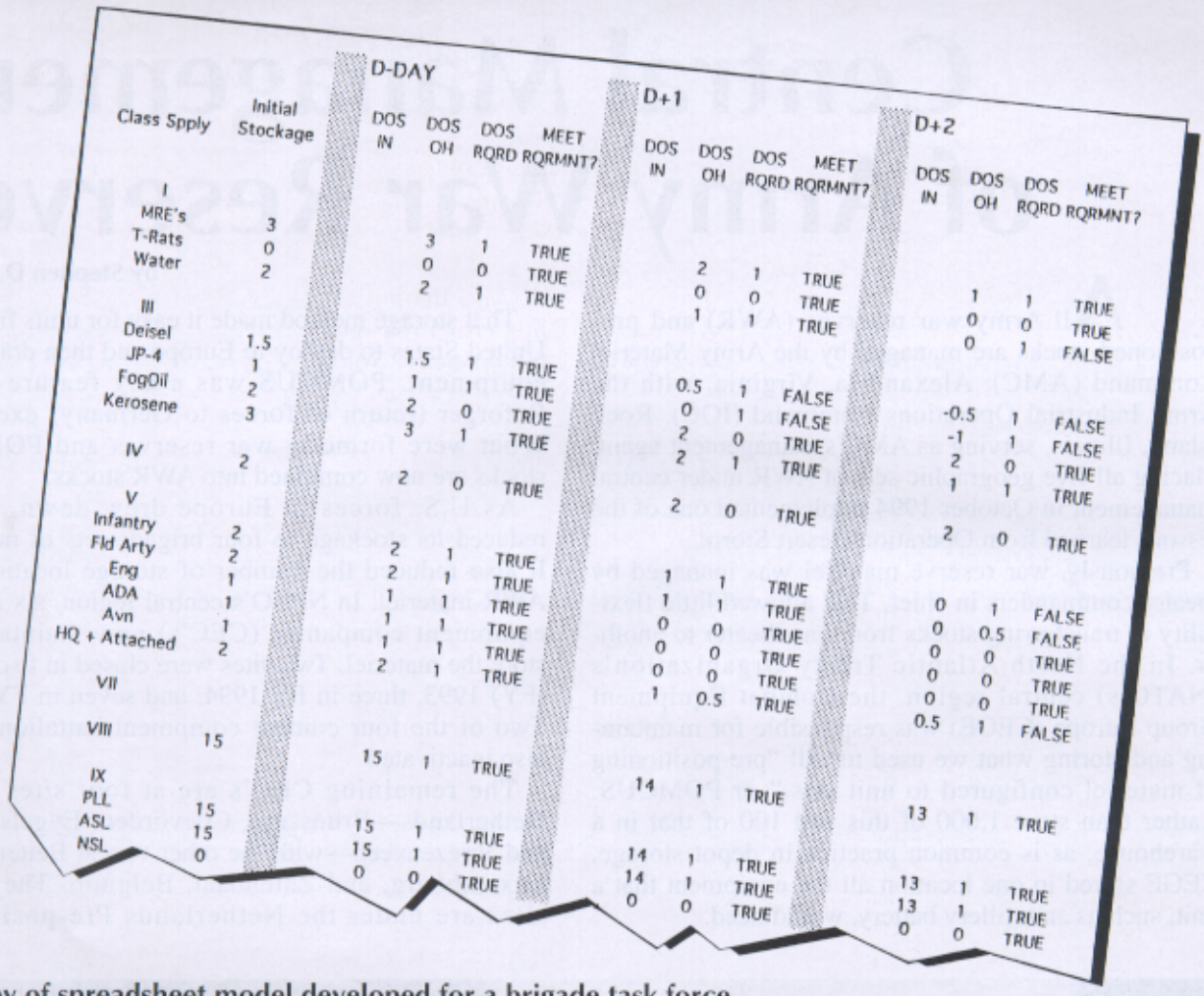
Requirements for items falling under classes I, III, IV, VI, and VIII could be determined based on known consumption rates, such as the MRE example, or estimated rates derived through use of FM 101-10-1, Staff Planning Guide; personal experience; and analysis of the anticipated operational tempo (OPTEMPO). Fuel and ammunition consumption were determined using the latter method, with the average expected daily consumption rate carried as 1 day of supply. During periods when this rate could be expected to rise or fall, such as before or after heavy activity, the consumption rates were correspondingly increased or decreased. Input of some requirements could be based on the commander's guidance. Barrier material and mine stockpiles were directed to be in place not later than day 7. Though a specific number of mines or rolls of concertina cannot truly be considered in terms of days of supply, the supply objective was known. This number was loosely termed 7 days of supply, and a single day of supply was measured as one-seventh of that total.

Class VII and IX items were not estimated for use in the initial plan because they are needed by exception and demand is determined on a case-by-case basis. All units should deploy with a 15-day supply based on the prescribed load list. There is no clear way to accurately predict additional requirements ahead of time, and demand depends almost solely on ground actions. In addition, the variety of items in these classes of supply is huge. Class IX ranges from firing pins for M16 rifles to major mechanical assemblies for vehicles. A truck engine and the transmissions for three high-mobility, multipurpose, wheeled vehicles (HMMWV's), for example, take up a good deal of aircraft space and can have a fairly sizable impact on the aerial delivery schedule. A requirement for two radiators and an antenna would have significantly less impact. Likewise in the class VII arena, replacing whole vehicles has far more impact than replacing weapons. To overcome such considerations, planners can leave empty slots in their delivery schedule, or they can use a bump plan to revise the priorities for the scheduled slots on a by-exception basis.

Once the initial plan has been completed, there are numerous reasons constant revision and adjustment must occur. Some have already been mentioned. These events have anywhere from minor to critical impact and can require simple modification or complete revision of the supply delivery schedule. An emergency requirement for Stinger air defense missiles, for example, might result in bumping one or two scheduled supply bundles, and a quick review of the spreadsheet model can easily determine which supplies are most appropriate for replacement. An event such as the destruction of a class V stockpile, however, would require a complete review of the entire spectrum of several days of supply in order to rapidly make up critical class V shortages. The commander's guidance and your own logistics expertise will be essential to prioritizing the other classes of supply and developing a time schedule that will allow units to regain appropriate stockage levels. The resupply model can give the visibility necessary to develop an optimal solution. Finally, a chemical attack in the BSA can destroy or contaminate all available stockpiles for the task force, and full-scale reconstitution would be necessary. In such a scenario, the most appropriate planning decision would be to clear the entire model and restart it using remaining supplies as the known initial stockage levels.

Another benefit of the model's flexibility is that it is simple to reevaluate and change anticipated consumption rates if necessary. Many of the rates used to create the initial plan were only best estimates. Once deployed, planners can fine-tune adjustments as actual requirements become known. Fighting in the desert, for example, requires a far higher consumption of lubricants and filters than fighting in the tropics. Actual combat, or lack of it, will tremendously impact the needs for ammunition resupply. Changing a few numbers on the spreadsheet allows simple adjustment of projected needs and a corresponding change to the aerial delivery schedule to avoid unexpected shortages or surpluses that waste cargo space. Again, planners can rapidly examine multiple options not only for feasibility of each course of action but also for simultaneous visibility of tradeoffs and costs to other requirements.

In any of these situations, the resupply model is a flexible tool to quickly assess and plan for changing



Class Spply	Initial Stockage	D-DAY DOS IN	D-DAY DOS OH	D-DAY DOS RQRD	D-DAY MEET RQRMNT?	D+1 DOS IN	D+1 DOS OH	D+1 DOS RQRD	D+1 MEET RQRMNT?	D+2 DOS IN	D+2 DOS OH	D+2 DOS RQRD	D+2 MEET RQRMNT?
I													
MRE's	3		3	1	TRUE		2	1	TRUE		1	1	TRUE
T-Rats	0		0	0	TRUE		0	0	TRUE		0	0	TRUE
Water	2		2	1	TRUE		1	1	TRUE		0	1	FALSE
III													
Deisel	1.5		1.5	1	TRUE		0.5	1	FALSE		-0.5	1	FALSE
JP-4	1		1	1	TRUE		0	1	FALSE		-1	1	FALSE
FogOil	2		2	0	TRUE		2	0	TRUE		2	0	TRUE
Kerosene	3		3	1	TRUE		2	1	TRUE		1	1	TRUE
IV	2		2	0	TRUE		2	0	TRUE		2	0	TRUE
V													
Infantry	2		2	1	TRUE		1	1	TRUE		0	1	FALSE
Fld Arty	2		2	1	TRUE		1	1	TRUE		0	0.5	FALSE
Eng	1		1	1	TRUE		0	0	TRUE		0	0	TRUE
ADA	1		1	1	TRUE		0	0	TRUE		0	0	TRUE
Avn	1		1	1	TRUE		0	0	TRUE		0	0	TRUE
HQ + Attached	2		2	1	TRUE		1	0.5	TRUE		0.5	1	FALSE
VII													
VIII	15	15	1	TRUE		14	1	TRUE		13	1	TRUE	
IX													
PLL	15	15	1	TRUE		14	1	TRUE		13	1	TRUE	
ASL	15	15	1	TRUE		14	1	TRUE		13	1	TRUE	
NSL	0	0	0	TRUE		0	0	TRUE		0	0	TRUE	

Copy of spreadsheet model developed for a brigade task force.

conditions that affect the resupply schedule. The same reassessment would be necessary in any number of other situations, including your brigade's loss of priority for air support. The advantage of using the spreadsheet is that several options can be evaluated without hours of pencil and calculator work. The logistician can look not only at the immediate mission directed by the commander but also can evaluate the impact such actions have on supply levels over the next week or longer. For example, if a commander were to direct that replacing ammunition would be the logistics priority for the next 2 days, the logistician could easily see how such activity might interfere with medical supply or class III buildup for another mission later in the operation. In addition, he would be able to determine feasible alternatives rapidly and confidently in order to make sound recommendations.

Though a JRTC rotation is a more familiar and definable scenario than the multiple real-world missions facing light infantry units today, most of the same factors apply to planning the aerial resupply for both. While the order and duration of individual missions in a real scenario cannot be as easily determined, the same mishaps and pitfalls that interfere with aerial resupply at JRTC should be expected. The model described here is applicable to both an artificial situation and a real one and allows not only rapid and effective initial planning but responsive and simple revision.

Inadequate supplies can cripple any combat unit and undermine the success of its mission. When dealing with aerial resupply, logistics planners must have the tools to offer responsive support to the ground soldier and the flexibility to make up shortfalls incurred when using nonorganic air assets. **ALOG**

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Central Management of Army War Reserves

by Stephen D. Abney

All Army war reserves (AWR) and pre-positioned stocks are managed by the Army Materiel Command (AMC), Alexandria, Virginia, with the Army Industrial Operations Command (IOC), Rock Island, Illinois, serving as AMC's management agent. Placing all five geographic sets of AWR under central management in October 1994 implemented one of the lessons learned from Operation Desert Storm.

Previously, war reserve materiel was managed by theater commanders in chief. That allowed little flexibility in transferring stocks from one theater to another. In the North Atlantic Treaty Organization's (NATO's) central region, the Combat Equipment Group Europe (CEGE) was responsible for maintaining and storing what we used to call "pre-positioning of materiel configured to unit sets," or POMCUS. Rather than store 1,000 of this and 100 of that in a warehouse, as is common practice in depot storage, CEGE stored in one location all the equipment that a unit, such as an artillery battery, would need.

That storage method made it easy for units from the United States to deploy to Europe and then draw their equipment. POMCUS was a key feature of the Reforger (return of forces to Germany) exercises. What were formerly war reserves and POMCUS stocks are now combined into AWR stocks.

As U.S. forces in Europe drew down, CEGE reduced its stockage to four brigade-sets of materiel. It also reduced the number of storage locations for AWR materiel. In NATO's central region, six combat equipment companies (CEC's) now maintain and store the materiel. Two sites were closed in fiscal year (FY) 1993, three in FY 1994, and seven in FY 1995. Two of the four combat equipment battalions were also inactivated.

The remaining CEC's are at four sites in the Netherlands—Brunssum, Coevorden, Eygelshoven, and Vriezenveen—with the other two at Bettenbourg, Luxembourg, and Zutendaal, Belgium. The Dutch sites are under the Netherlands Pre-positioned

An Italian employee of Leghorn Army Depot Activity in Italy loads ammunition into a container for shipment.

A sling load of contingency stocks is delivered to field unit.

Organizational Materiel Sets, a subcommand of the National Command of the Royal Netherlands Army; and storage and maintenance functions are performed "on contract" with the U.S. Army at those sites. The organization is managed by the management team at Coevorden; and its workers are Dutch civil servants. The U.S. commander at each site acts as a contracting officer's representative.

CEGE is also responsible for U.S. equipment stored at a NATO facility in Bardufoss, Norway. Bardufoss, 100 miles north of the Arctic Circle, stores enough equipment for four battalions—one each from Canada, Germany, Norway, and the United States. The U.S. equipment is for use by the 1/214 Field Artillery Battalion, Georgia Army National Guard. While CEGE personnel assist the unit, no U.S. personnel are assigned there. Finally, CEGE stores Air Force equipment on a reimbursable basis at Sanem, Luxembourg, a subfacility of Bettenbourg.

In line with the consolidation of AWR stocks in the three Low Countries, CEGE is in the process of moving its headquarters from Mannheim, Germany, to Kerkrade, the Netherlands. Worldwide, the AWR stocks are managed by the IOC's Deputy Chief of Staff for War Reserves.

The five geographic sets of AWR are located and managed as follows—

• AWR-1 are stocks in the continental United States, stored in depots and managed by AMC's commodity commands. The IOC is responsible for the ammunition in AWR-1 and stores and maintains various other items of AWR-1-stocks for the other commodity commands. Operational project stocks at Sierra Army Depot, for example, are part of AWR-1 and consist of water purification equipment, petroleum distribution equipment, and the ready-to-go Force Provider tent city.

• AWR-2 are the European stocks that fall under CEGE, as I discussed earlier. Last October, Leghorn Army Depot Activity in Italy became part of CEGE and maintains accountability for materiel stored in Israel. CEGE currently has assigned about 100 military, 50 civilians, 600 local nationals, and 1,150 contract employees. Total AWR-2 funding is approximately $100 million.

• AWR-3 eventually will store enough materiel for two brigades aboard 16 ships. The IOC already has assumed responsibility for AWR-3. The pre-positioned ships are loaded at the Strategic Logistics Mobility Base, Charleston, South Carolina; and Hythe Army Depot Activity, England, maintains the Army watercraft that are part of the AWR-3 equipment. The watercraft are used to open ports, provide logistics-over-the-shore, and serve as lighterage. At any given time, about half the AWR-3 watercraft are riding aboard a heavy-lift, pre-positioned ship in the Indian Ocean. Hythe sent employees to help download watercraft during recent operations in Kenya, Saudi Arabia, and Somalia.

• AWR-4 are in Japan and Korea to support the Pacific theater. The major maintenance and storage facilities for AWR-4 are at the Materiel Support Center-Korea at Camp Carroll and at Sagami Army Depot, Japan. The management cell for AWR-4 is in Korea and administers, plans, and executes the AWR-4 program.

• AWR-5 are located in Southwest Asia and consist of two brigade-sets of materiel—one stored in Kuwait and the other stored in Qatar. Plans call for storing a third brigade-set in the region eventually. The IOC is scheduled to assume control of AWR-5 by 30 April 1996.

The mission may grow even more. Since the purpose of war reserves is to have materiel ready to handoff to units at any location to which they have deployed, the IOC is studying a proposal to provide handoff training. The scenario would call for units to be issued their equipment at the National Training Center, Fort Irwin, California, when they arrive for a training rotation, as practice for real deployments.

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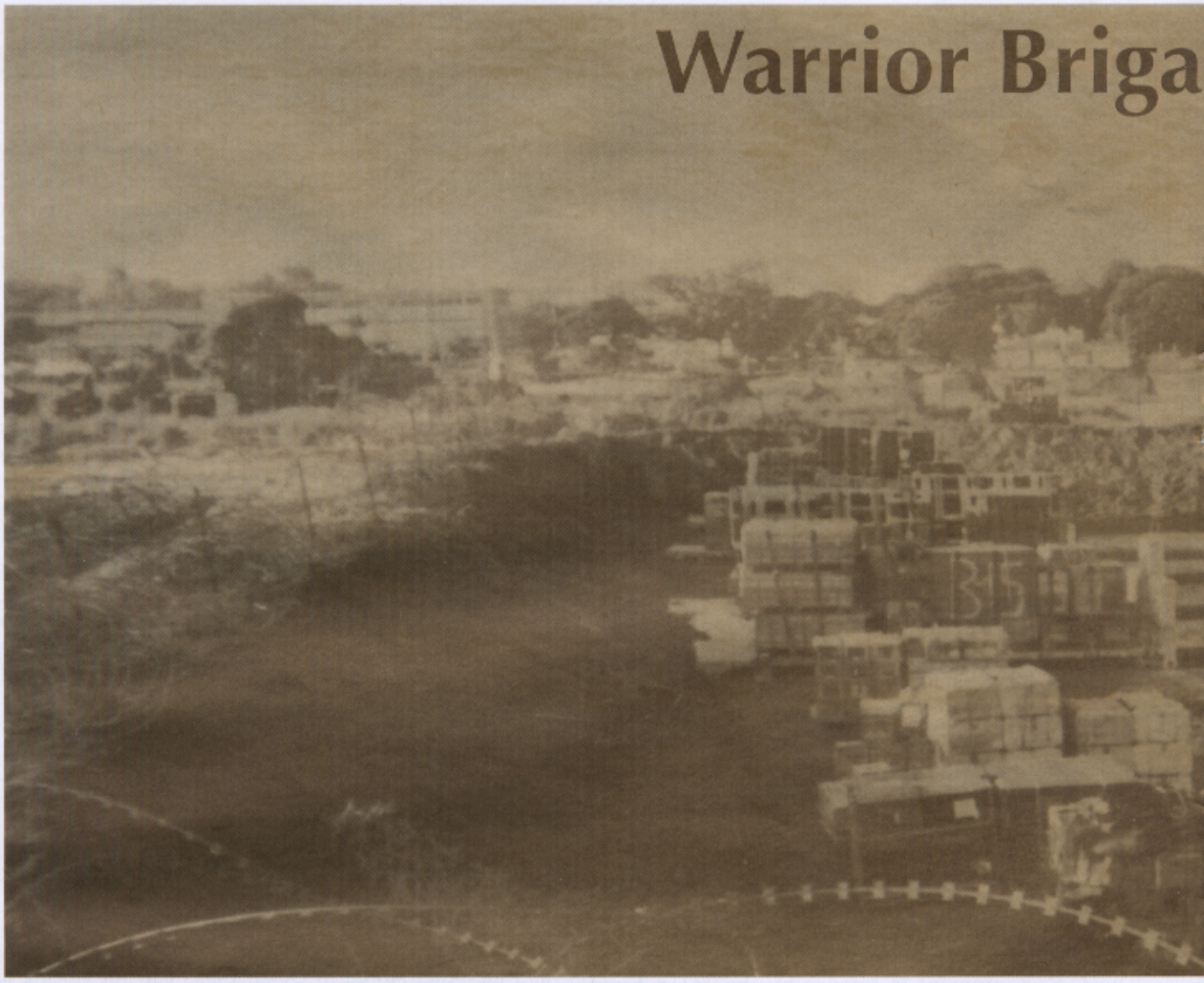
Warrior Briga



It was early August 1994. Political rhetoric was stiffening against the outlaw government of Haiti. In a Fort Drum, New York, training area, preparations for forced-entry operations were accelerating for the 1st Brigade (Warrior Brigade) combat team, 10th Mountain Division (Light Infantry).

Training for numerous scenarios continued around the clock to prepare the 10th Forward Support Battalion (FSB) to provide class V (ammunition) support of the initial Warrior Brigade assault package.

Later that same month, it was announced that elements of the Warrior Brigade, including the 10th FSB, would deploy to the joint operations area by ship. Immediately, the 10th FSB began planning for shipboard support operations that would later transition to a shore-based forward logistics element and, finally, to a forward operating base.

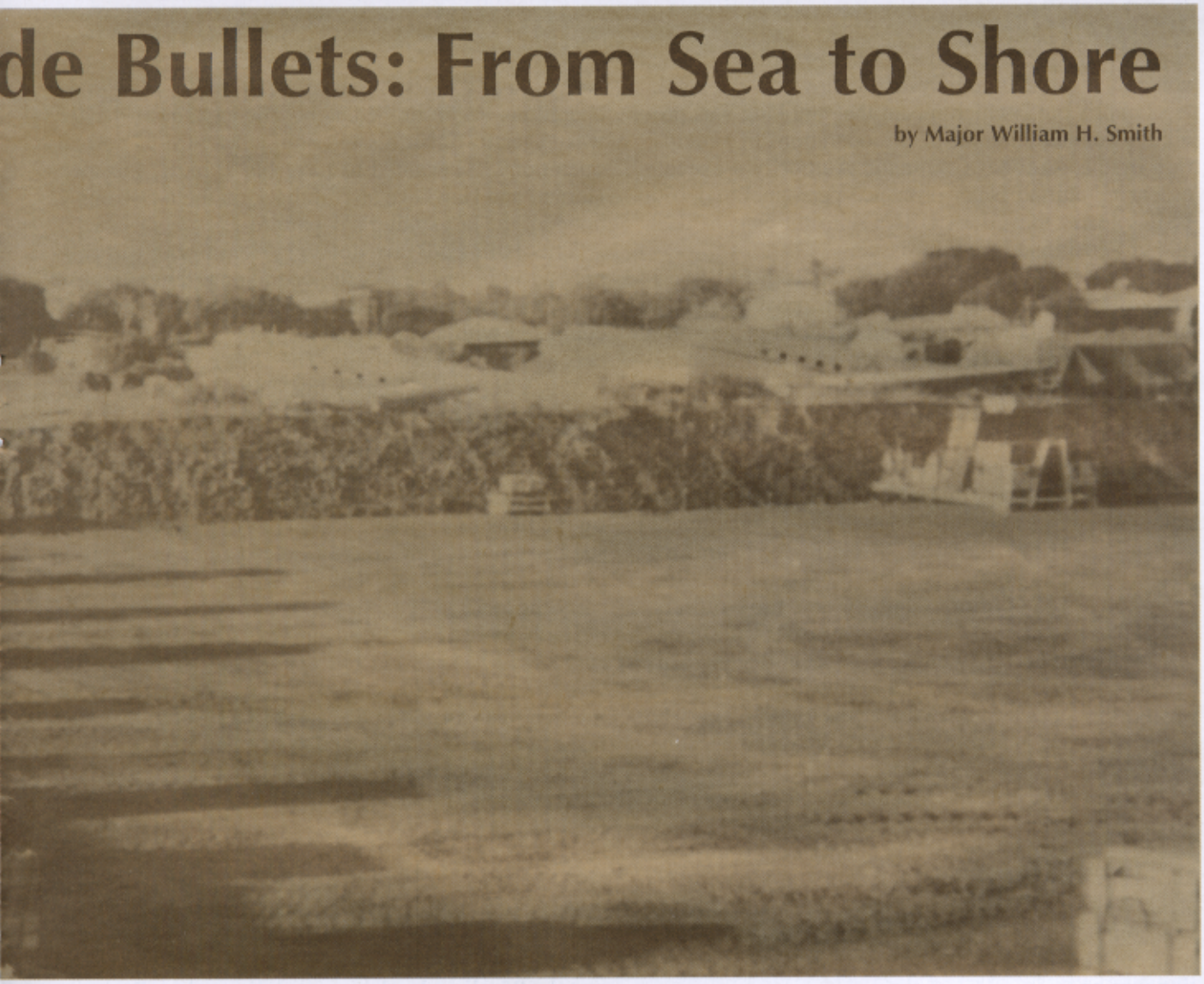
Constant changes in force structure kept everyone guessing about whether entry would be permissive or nonpermissive. Simultaneously with predeployment planning and train-ups, the 10th Aviation Brigade practiced helicopter landings and liftoffs on aircraft carriers at Norfolk, Virginia. On 13 September, the Warrior Brigade assault package, consisting of two light infantry battalions, the 10th FSB, and elements of the 10th Aviation Brigade deployed to Haiti aboard the aircraft carrier *USS Eisenhower* (the "*Ike*").

Being aboard the *Ike* was a first for the 10th FSB soldiers. The first order of business was orientation to the ship. Terms such as deck, bulkhead, stateroom, and galley were all foreign to light fighters. A quick vocabulary lesson and "you are here" diagrams placed along the ship's passageways helped, but most soldiers resorted to asking sailors for directions.

Rumors about the great chow aboard ship were true. The *Ike's* dining facilities (or galleys) were open

de Bullets: From Sea to Shore

by Major William H. Smith



The 10th Forward Support Battalion received, stored, and issued ammunition from the theater ammunition storage point at Bowen Military Airfield in Haiti.

24 hours a day, and the food was excellent. Hot meals, ice cream, and all the salads a hungry soldier could eat were standard. Midnight rations were very popular. A highlight for the soldiers was the invasion-eve feast of king crab legs, lobster, and steak.

As soon as the Warrior Brigade was organized aboard ship, precombat checks and rehearsals began in preparation for the green light for Operation Uphold Democracy. Intervention plans changed daily. There was a plan for every possible entry scenario. Would Warrior Brigade carry out a forced entry? Was the 82d Airborne Division coming? Who would be the follow-on force? Where was corps support? As the hours ticked down to D-day and then to H-hour, only the diplomatic process would determine when and how Operation Uphold Democracy would unfold.

Ammunition handlers from the 10th FSB worked closely with Navy ordnance personnel to ensure that the Army class V unit basic loads (UBL's) were loaded on board before departure for Haiti. Moving the ammunition required close coordination between the 10th FSB support operations officer and the Naval ordnance handling officer who was responsible for storage, movement, and control of all explosives on board.

Early on 18 September, class V stocks that included small arms rounds, grenades, and antitank grenade launchers were brought up from the *Ike's* ammunition magazines and placed in linear unit sets on the hangar deck. Before the onboard ammunition was moved, a

voice over the intercom system bellowed, "the smoking lamp is out," which meant that smoking was prohibited for the duration of the operation. In anticipation of the National Command Authority's execute order, red-shirted Navy ordnance personnel and 10th FSB soldiers moved all UBL's onto the hangar deck and pre-positioned them for issue.

The handheld PRC-127 radio, the 10th FSB's primary internal communication asset, proved vital for linking the battalion command group together on a ship as large as the *Ike*. However, whenever ammunition was moved from the magazines to the hangar deck, all radio systems had to be turned off because certain explosives can be accidentally detonated by radio signals. When the use of the PRC-127's was prohibited, the *Ike's* internal telephone system and company couriers provided backup communication.

While still off the coast of Haiti, the 10th FSB established an ammunition issue-point assembly line. Invasion force soldiers filed by and took bullets, grenades, and rockets directly from packing crates according to the commander's issue guidance. This method of issue was fast and eliminated the need to handle the ammunition twice at the issue point. The Navy ordnance handling officer documented accountability for UBL's on the ship's automated ammunition stock control record. As directed by a 10th Mountain Division ammunition office representative, class V was also issued in unit sets to battalion supply officers and recorded on the Navy's automated ammunition stock control record. Just as the initial class V issue was completed, the National Command Authority designated 19 September as D-day. The Haiti intervention was on.

Last-minute negotiations transformed the intervention in Haiti from nonpermissive entry to permissive entry operations. Precombat checks were made, and Warrior Brigade elements began historic air assault operations from the *Ike's* flight deck.

As Warrior Brigade soldiers departed the ship, an assortment of ammunition remained on the hangar deck and in the ship's magazines for follow-on operations. The 10th FSB assumed control of all remaining seaborne ammunition (that of both the Warrior Brigade and the 10th Aviation Brigade), and the ammunition pallet count quickly grew to 150.

Following the departure of Warrior Brigade elements on D-day, the 10th FSB was tasked to establish a forward operating base. A small, 12-soldier team remained on the *Eisenhower* to clear the ship of all Army class V stocks as soon as possible. Sling-load operations began immediately. The captain of the *Ike* was eager to finish his mission and return to normal operations. He wanted to have his Tomcat, Intruder, Hornet, and Hawkeye aircraft back on the *Ike* within 2 hours of the last soldier's departure.

The 10th FSB air delivery team was quickly pressed into service. As the operational tempo quickened, the troops performing ammunition removal competed with aerial water resupply troops for cargo nets and air delivery slings. The 10th FSB established a class V riggers' assembly line and pre-positioned the air delivery cargo nets and 463L pallets on the hangar deck. Navy ordnance handlers simultaneously positioned pallet loads of ammunition for rigging. The 10th FSB immediately formed three teams that could rig nine loads every half hour. The rigging teams were so efficient that they quickly exceeded the availability of free cargo nets, air delivery slings, and aircraft to carry the loads.

Each load of ammunition was marked with the cargo load weight and the appropriate landing zone destination in and around the Port-au-Prince International Airport and seaport. Each sling load was inspected by 10th FSB and Navy ammunition handlers for compatibility and by 10th FSB riggers for airworthiness. Navy safety personnel conducted the final clearance inspection, and any required corrections were made on the spot. Once cleared for departure, the rigged class V loads were moved to one of three giant aircraft elevators and lifted topside to the flight deck.

Most of the 150 pallets of ammunition (approximately 85 sling loads) were delivered to Port-au-Prince International Airport. As the *Ike* prepared to depart the joint operations area, the 10th FSB ammunition handlers were airlifted to the airport and positioned to take control of the class V supplies. A holding area was established at one end of the runway, and class V supplies were collected, segregated by type for compatibility, and temporarily stored using limited materials-handling equipment and personnel.

Meanwhile, the 10th FSB established a forward operating base for the Warrior Brigade at Bowen Military Airfield, a Haitian Air Force facility that is located approximately 3 kilometers south of Port-au-Prince International Airport. Within hours, the 10th FSB was notified that all class V stocks at Port-au-Prince International Airport would have to be moved to Bowen Military Airfield because they posed an

unacceptable hazard to incoming aircraft, including civilian airlines. Follow-on mechanized forces from Fort Stewart, Georgia, used a palletized load system to transport the ammunition from the airport to the airfield.

The 10th FSB's primary concerns became storage and security of the division's class V stocks. Empty MILVAN's were placed around the flatracks of ammunition to obstruct observation by the surrounding Haitian populace, and three strands of concertina wire were erected to prevent access by unauthorized personnel.

In a remote area of Bowen Military Airfield, engineers constructed an ammunition storage point measuring 100 meters by 100 meters, complete with drainage ditches and 8-foot-high berms, and surrounded the area with triple-strand concertina wire. The 10th FSB immediately established the first theater ammunition storage point and began receipt, storage, and issue of ammunition.

Just days later, the division ammunition officer coordinated with the XVIII Airborne Corps 8th Ordnance Company for removal of the ammunition from Bowen Military Airfield to their newly constructed theater ammunition storage point. With the transfer of the ammunition, the 10th FSB was relieved of its ammunition storage point mission.

After Bowen Military Airfield was cleared of explosives, the 10th FSB discovered that the manicured area once used to store tools of destruction could be used as a soccer field by the Haitian Air Force, and the surrounding berms could serve as elevated spectator viewing areas.

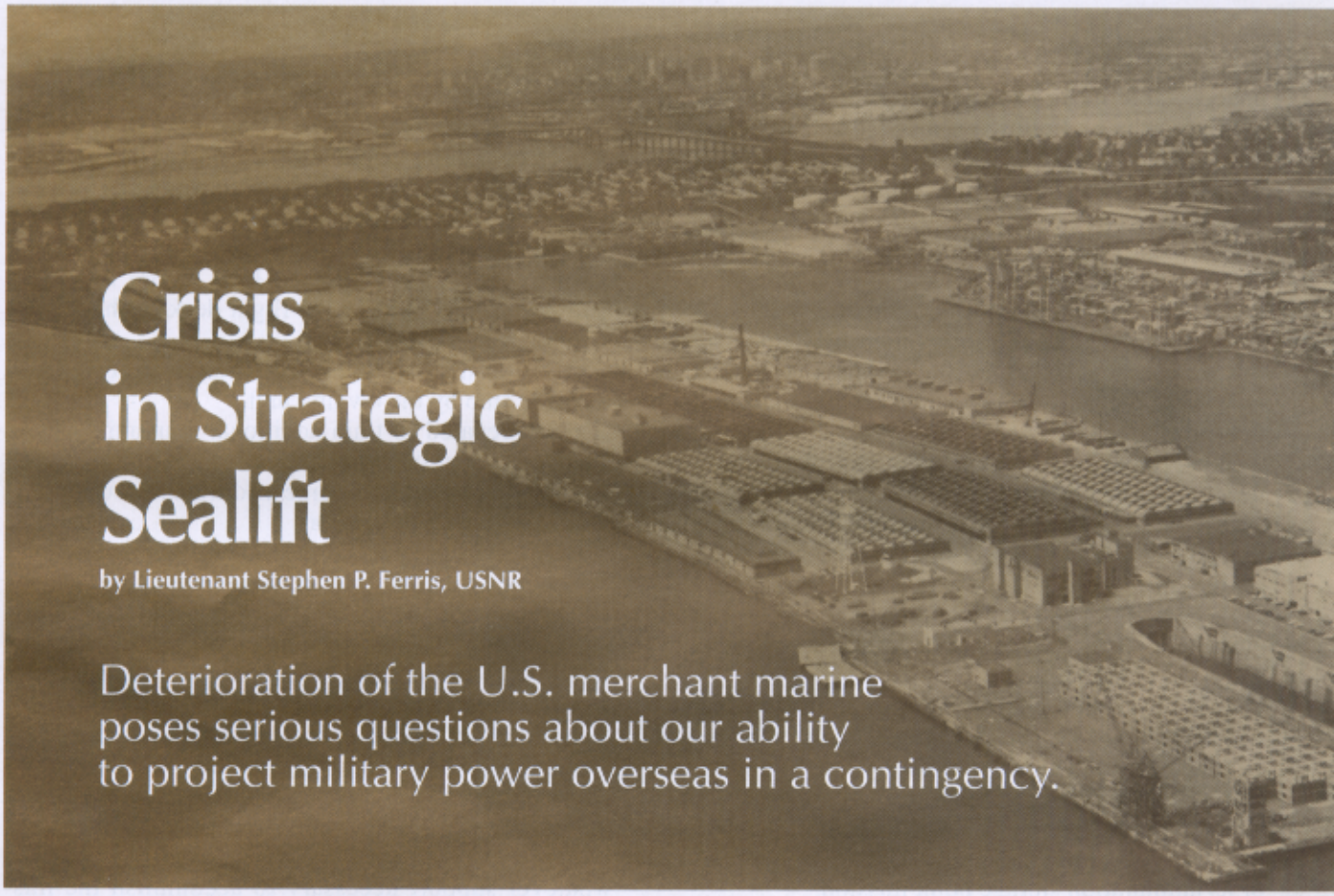
Logisticians studying logistics operations in Haiti will find that ammunition support during the infancy of Operation Uphold Democracy, from seaborne operations to establishment of the ammunition storage point in the joint operations area, transcended doctrinally stated missions. Future logisticians providing ammunition support under similar circumstances can benefit from the following lessons learned—

- Be flexible, think big, and anticipate missions beyond those doctrinally assigned.
- Establish early and direct coordination with the Navy ordnance handling officer.
- To meet operational timelines, preload ammunition into magazines, place ammunition at the issue point in advance, and stage individual equipment.
- Establish dedicated helicopters for ship-to-shore support missions.
- Ensure that an air delivery net and sling plan is part of operations planning. Consolidate all nets and slings under control of the task force logistics officer.
- Ensure that all unit equipment is properly marked for return after air delivery operations are concluded.
- Compute weight of each load before moving it from the hangar deck to the flight deck for hookup to a helicopter.
- Ensure that all issued UBL items are evacuated from the ship by the owning unit.
- Be prepared to train additional ammunition handlers to assist at the ammunition storage point.
- Be prepared to resource additional security personnel for bulk ammunition.
- Maintain a well-trained and robust air delivery capability within the forward support battalion.

Many factors, including creativity and flexibility, influenced the success of ammunition support during Operation Uphold Democracy. However, in the end it was the sheer determination of the light fighter logisticians that got the job done.

As logisticians of the future study accounts of support operations in Haiti, the professional will discover that the standard upon which excellence is measured ultimately rests with logisticians willing to provide whatever support necessary to accomplish the mission. **ALOG**

Major William H. Smith is a quartermaster officer and was assigned as executive officer, 10th Forward Support Battalion, during Operation Uphold Democracy. His assignments included logistics officer, United Nations Joint Security Force, Panmunjom, Korea; deputy J4, Joint Task Force Somalia, for Operation Continue Hope; and deputy G4 and division supply and services officer, 10th Mountain Division (Light Infantry), Fort Drum, New York. Major Smith is a graduate of the Army Logistics Management College's Logistics Executive Development Course and the Command and General Staff Officers Course.



Crisis in Strategic Sealift

by Lieutenant Stephen P. Ferris, USNR

Deterioration of the U.S. merchant marine poses serious questions about our ability to project military power overseas in a contingency.

Strategic mobility is critical to the success of U.S. military strategy in the post-cold war security environment. Our military planners must monitor a global network of interests and a multiplicity of threats. Warfighting and threat response require a sophisticated logistics capability that can transport vast amounts of materiel to distant theaters. Our military history clearly demonstrates that almost all of this materiel will be transported by sealift.

In spite of its overwhelming importance, the strategic sealift capability of the United States has been allowed to wither. The size of the U.S. commercial fleet has fallen constantly since World War II, with predictable results for the availability of trained merchant seamen to support a prolonged military campaign. The National Defense Reserve Fleet (NDRF) does not have extensive seaworthy capacity, as the recent Persian Gulf War illustrated.

The issue of sealift adequacy has both immediate and long-term implications. The immediate challenge is ensuring that sufficient sealift is available to support Army or Marine Corps ground forces that may be deployed in a crisis. The long-term issues that we must consider are establishing a national policy on subsidizing the maritime industry and crafting a domestic response to foreign protectionism.

Critical Shortfalls in Strategic Sealift

Sealift consists of ships that transport cargo and mariners who operate those vessels. The United States currently has a shortfall in both areas. In many ways, however, the shortage of ships is more critical. This is because the number of licensed and qualified merchant seamen ultimately depends on the size of the commercial fleet.

Both the projected volume of U.S. military needs and the geographic expanse of our defense commitments will combine to overtax the sealift assets now available for a military emergency. Sealift capacity either directly controlled by or under contract to the U.S. Government is insufficient to sustain any prolonged Army ground campaign. Airlift cannot meaningfully correct this shortage because of its inherent cargo-carrying limitations and expense. Thus, if projecting military force is to remain a viable option for U.S. policymakers in the post-cold war era, we must address the inadequacy in sealift.

The underlying cause for the shortage in sealift

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

Military Ocean Terminal Bayonne, New Jersey (above), operated by the Military Traffic Management Command, is an important component of U.S. sealift capabilities. Container ships (inset) dominate the commercial shipping industry, but the Department of Defense has made only limited progress in using them.

capability is inadequate capital investment in the U.S. shipping industry. But the determinants of capital formation within an industry are not magical; they derive from the simple economics of investment. The commercial shipping industry in the United States has declined because it no longer provides an attractive rate of return to investors. As the Department of Defense (DOD) downsizes, naval shipbuilding has been reduced, and that, in turn, has had an adverse impact on industry demand.

Perhaps even more important has been the reduction in demand for U.S. shipping by domestic businesses as foreign shipping has become more cost-competitive. U.S. firms find it economically advantageous to contract with foreign rather than domestic shippers in their business operations.

Largely because of programs and subsidies offered by their governments, these foreign shipping lines enjoy a more competitive cost structure than U.S. companies. Many foreign governments are active partners with their private shipbuilding companies, providing them with construction and operating subsidies, low-interest loans, cargo preferences, tax benefits, and various credits. This protectionism by foreign governments has resulted in an economic environment in which the unsubsidized U.S. shipping industry cannot compete.

As a result of the shrinkage of the U.S. shipping industry, the supply of qualified mariners has also declined. Once again, the phenomenon is economic. As the demand for U.S. shipping falls because of an unfavorable cost structure, the demand for U.S. mariners is likewise reduced. This creates an exodus of seamen from the industry and deters entry by new individuals. Although the mariner labor market may be in equilibrium from an economic standpoint, there will be an insufficient supply of skilled merchant seamen to satisfy the surge requirements of a military emergency.

Future of U.S. Strategic Sealift

Assessing the sufficiency of U.S. strategic sealift is highly situational. In contingencies like Operations Desert Shield and Desert Storm, our sealift capacity appears adequate. That conflict was characterized by a long lead time before actual hostilities began, which allowed our forces to establish forward logistics bases and transport needed materiel in an orderly fashion. Worldwide approval of the campaign resulted in a multinational effort rather than a unilateral U.S. operation, which ensured that foreign shipping was available to supplement U.S. capacity.

If, however, a conflict does not fit the Desert Shield-Desert Storm framework, then the future looks grim for U.S. strategic sealift sufficiency. A prolonged war, an internationally unpopular conflict, or a war with interdiction of U.S. transports by enemy forces will reveal the shortages in U.S. sealift.

The reasons for such a shortage are numerous, and no easy solutions are apparent. Current shipbuilding in the United States is negligible, and there are no signs of a likely turnaround. Moreover, given the long lead times associated with shipbuilding, any newly constructed vessels would only join the fleet a number of years into the future. Naval construction also continues to shrink, with the Navy falling below 400 ships for the first time since 1945.

Economic issues are also prominent in justifying pessimism. The U.S. will need to subsidize its shipbuilding and shipping industries if it is to possess adequate domestic sealift. A reserve program may also be

necessary to ensure a sufficient supply of ready and able mariners. But who will pay for these subsidies and programs? Given the recent trend toward economic deregulation, the intense political interest in domestic affairs following the cold war, and the historic U.S. inability to anticipate warfighting requirements, the future does not appear promising.

There also is no indication that the distorted economics of U.S. shipping wrought by international protectionism will correct itself in the near future. The current cost structures of the international shipping industry continue to remain unfavorable for developing competitive U.S. shipping rates. Concessions on this issue are doubtful, as foreign shipping interests continue to lobby their home governments to maintain their subsidies.

Two other issues further suggest that future U.S. sealift will continue to be inadequate. First, in spite of the fact that nearly 70 percent of the commercial shipping industry is containerized, DOD has made only limited progress in fully using container ships. Second, the Persian Gulf War revealed the poor state of readiness of many ships in the NDRF. The extent to which the NDRF can serve as a useful reserve of sealift capacity remains highly uncertain.

Satisfying Our Contingency Requirements

We have noted that, under highly specific circumstances, the current U.S. sealift capacity can satisfy national contingency requirements to support foreign-deployed ground forces. These circumstances involve the conflict's duration, the magnitude of required materiel, the theater's distance from the United States, and the international popularity of the war. Under appropriate circumstances, the Military Sealift Command fleet, the Ready Reserve Fleet (RRF), and ships pre-positioned abroad might be able to provide the sealift needed to respond to a military contingency.

The more interesting question, however, concerns the ability of the United States to satisfy its contingency requirements under a different set of assumptions. If the conflict is prolonged, and unaccompanied by a 7-month logistics buildup, then sustainment becomes more uncertain. As a conflict moves away from the characteristics of Desert Shield-Desert Storm, contingency sustainment becomes increasingly difficult.

A number of factors will either contribute to or exacerbate the inadequacy of current strategic sealift during a prolonged crisis. The first is the limited shipping assets that are presently available in the United States. The existing inventory of commercial shipping is meager, with no new construction under order. A unilateral military campaign by the U.S. might worsen the shortage if the conflict was unpopular abroad and access to foreign shipping deteriorated. Although the RRF can become operational within a period of 30 days, the NDRF is a much less useful asset. The long lead time needed to make the NDRF seaworthy prevents it from satisfying surge requirements, while the obsolete technology of many NDRF ships reduces their ability to provide sustainment support. Lastly, the trained mariners needed to man the ships providing the logistics sealift are simply not available in the United States. Nor can the labor market respond quickly enough to satisfy contingency requirements, given the time required to train a merchant seaman.

I conclude that current sealift capacity makes it extremely difficult for the United States to satisfy its present contingency obligations. It is only in the context of a highly popular and short war that current sealift would prove adequate. A prolonged conflict that fails to permit a pre-hostilities logistics buildup will overtax U.S. sealift capacity. A major reorientation of U.S. public policy toward subsidizing and nurturing the domestic shipping industry is probably necessary before sufficient sealift capacity becomes available.

The U.S. shipping industry is in a pronounced state of decline. Moreover, as the industry contracts, so does the pool of qualified mariners. The national security implications of these twin trends are significant. As the commercial fleet shrinks, so does our domestic sealift capacity. This suggests that the strategic mobility of U.S. ground forces may become compromised at the very point in time when their mobility is most critical. The ability of the United States to satisfy its contingency obligations is threatened when domestic sealift is insufficient and foreign shipping must be substituted. A shortage of trained merchant seamen further complicates the problem.

Although the solution to these problems is not simple, it nevertheless reduces to one of economics. The subsidization of foreign shipping lines by their governments has made American shippers uncompetitive. Federal programs to stimulate and protect the domestic shipping industry may be necessary if we are to possess an adequate and independent sealift capability.

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A Logistician's Command Vision

by Colonel Larry D. Harman

If he is wise, a new logistics commander, regardless of the size or level of his unit, will develop a vision statement to guide the unit, its leaders, and himself. Some may view a vision statement as an insignificant formality required of a new commander—one that he can quickly forget about after he settles into command. Wrong! An enduring vision for command is essential.

What, exactly, is a commander's vision? It is the commander's condensed expression of the unit's purpose, ideals, and end states. The commander's vision clearly and succinctly focuses on the principal issues that impact unit effectiveness. It is more than a restatement of the unit's mission-essential task list or mission statement. It provides a glimpse of the commander's core values, beliefs, and passions. The commander must write his own vision statement and mean every word of it.

A well-conceived, concise vision statement requires assessment of the unit and its activities as well as creative thinking, input from others, and long-term goal setting. Once the vision statement is finalized, it should be distributed throughout the command to help the soldiers develop a better "feel" for their commander based on his vision.

There is no recipe for producing a commander's vision. Each one is unique, but they do share some common characteristics—

- There is no room for ambiguity.
- It is achievement oriented and rekindles soldier and leader enthusiasm.
- It affirms the commander's commitment to the unit and to superior mission support.
- It is inclusive rather than overly specific in nature; it guides the entire unit toward ideal end states.
- It addresses the core capabilities and skills that allow the unit to endure as an effective force.

A genuine vision statement leads to, but does not guarantee, legitimacy and credibility for the new commander. Only the commander's deeds and selfless service guarantee legitimacy and credibility.

A typical command vision statement may read—

We will provide first-rate command and control for assigned and attached forces with leaders (both line and staff) who will be trained to act decisively. We will master the basics and fundamentals in all that we do to stay proficient. We will deploy effectively as a logistics task force (LTF) or as part of a larger LTF. Whether or not our soldiers are deployed, their families will always be our concern. We will provide for internal sustainment—maintenance, supply and services, and soldier support—while providing combat service support to supported units at the right time, in the right place, and in the amount required. We will demonstrate a genuine sense of urgency in our approach to logistics support. We will protect and manage our human and material resources and use them wisely to influence tactical mission success. We acknowledge that each success is only a phase line, and will remain alert and flexible to changes. We will strive to be a learning organization that embraces creativity, initiative, soldier education, teacher and leader development, coordination, and risk-taking. Our unit's foundation will be built with sound leadership, quality management practices, and "intangibles" such as pride and cohesion that are inherent in dynamic units. The pillars on this foundation will be command and control, mission support, organizational sustainment, force protection, and deployment readiness. We will constantly assess our achievements and strive for excellence in all that we do.

Each new commander must prepare his vision statement based on personal assessments, past experience, input from others, and intuition. The vision statement, coupled with the commander's philosophy, lays the groundwork for the development of a comprehensive, coordinated command strategy. **ALOG**

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Supporting Nondivisional

Planning for support of nondivisional engineer forces operating
Here are some ways to improve the process.

While transitioning to a deliberate defense, the division G3 discovered that he needed more engineers. After a hasty conference with his assistant division engineer, the G3 requested a corps combat battalion in direct support. Within hours, a corps combat engineer battalion was moving forward into the division area.

But problems soon arose. As the battalion set to work, it immediately ran into shortages of petroleum, oils, and lubricants (POL). The forward support battalions (FSB's) for the forward brigade, as well as the main support battalion (MSB) in the division rear, were already stretched to their limits. In order to secure fuel, the engineer battalion's TPU's had to make the long haul back to the corps rear to fuel points established along the main supply routes. Dozers and small emplacement excavators began to break down, but maintenance support (aside from the battalion direct support unit) was far to the rear. Special munitions items, such as mines, were in short supply, and the availability of construction and barrier materials was limited.

What was the result of the engineers' logistics problems? What looked like a robust engineer team quickly became a logistics nightmare and a burden to the maneuver unit. Potential combat power was wasted, and so was the precious force multiplier represented by the combat engineer battalion.

This scenario actually occurred in a recent Warfighter exercise, and it focused attention on the need to support nondivisional engineer units operating within a division and a corps. The crux of the problem was inadequate planning when tasking the combat engineer battalion. At no time during the Warfighter exercise did planners consider how to support the engineer force. As usual, support was expected to magically appear, much like an apparition. The planning process did not include a thorough assessment of the logistics requirements of the engineer battalion and did not develop an effective method for supporting it in the division area.

Supporting nondivisional engineers is always difficult. Let me present some strategies for improving the planning process for engineer logistics support and making the engineer force more effective. Though my focus is on light infantry and airborne units, the lessons can be easily extrapolated to heavy forces; the differences are a matter of scale, not process.

Challenge of Supporting Engineer Units

Engineers present a unique logistics challenge. Of all the supporting arms, they are perhaps the greatest consumers of logistics. FM's 101-10-1 and -2, Staff Officers' Field Manuals, allocate 8.5 pounds of construction and barrier materials (class IV) per man per day. But experience indicates that a battalion can use considerably more. Engineers have limited haul capability and cannot even begin to move what they require. Most of their vehicles are dedicated prime movers. Someone else must bring bulk class IV supplies forward.

Engineers have low-density, and some admittedly fragile, equipment. Anyone who has worked with an M1087 small emplacement excavator can appreciate

☐ **Engineers require large quantities of class IV for such tasks as constructing base camps.**

Engineer Forces within the division area is often inadequate.

by Major Christopher J. Toomey

how hard it is to get parts. Supporting the engineer force is made more difficult by the many items of unique, maintenance-intensive equipment engineers carry.

Engineer forces often are needed very early in contingency operations, before a logistics infrastructure is established. Lack of support planning for the engineers not only reduces their effectiveness but also limits their participation. The support infrastructure at division level is often ill-prepared to receive and support these units without significant assistance from the corps support command (COSCOM).

Engineer Support Options

When engineer and CSS planners are faced with the task of providing combat service support (CSS) to nondivisional engineers supporting division forces, they can consider several options proposed in FM 63-3, Corps Support Command. They need to be sensitive to the advantages and disadvantages of these options, including the significance of the support relationship. Planners can—

Use dedicated combat support battalions (CSB's) in the division rear. This is a good general option; it is especially convenient when the engineer assets are operating in direct support of the entire division and the division area of operations is stable and mature. However, during periods of rapid movement, or when limited CSS assets have deployed, it will be difficult for engineer assets to acquire support under this option. In addition, moving CSB's into the divisional rear area can present a real estate management problem for the division—particularly if physical space in the rear area is limited.

Augment the divisional FSB's and MSB. Adding limited CSS assets to the divisional support structure provides support when engineer assets are attached to the division or physical space is limited. In this configuration, the division CSS planners can best allocate the CSS assets provided by the COSCOM. These assets can deploy as part of the FSB and MSB slice during contingency operations.

Rely on the divisional FSB's and MSB. It is possible, particularly if engineer units will be in direct support for a very short duration, for CSS to be drawn directly from the divisional CSS slice. This is conve-

nient because it requires no reallocation of CSS assets. However, care must be taken to ensure that divisional assets are not overtaxed to support the engineers.

Deploy a CSS slice with the engineers. If a large engineer task force is deployed, it may be a good idea to deploy a CSS slice under engineer control. This option is attractive if engineers are conducting operations with the other armed services and allies. In all cases, care must be exercised in determining requirements and packaging the CSS assets to fit the need. For example, a POL capability may not be needed when working with Navy engineers if they agree to provide POL.

Getting It Right

Determining the best support option, or combination of options, and the CSS requirements for engineer forces requires logistics deep planning, which must be done in concert with operational planning. Typically, engineer staffs at the corps and division levels place most of their focus on operational concerns and regard logistics requirements as secondary. Most CSS planners focus on supporting maneuver and fire support units so that combat support units like the engineers become an afterthought. Engineer planners cannot let this happen; they must establish a solid interface with CSS planners and be able to articulate their requirements clearly and early. Here are a few key points to keep in mind—

The engineer planner must have a firm grasp on the CSS requirements of engineer forces in the area and must be in a position to pass these requirements and recommendations for support to the CSS planner. An engineer planning guide summarizing vehicle densities and requirements (such as one published by the assistant corps engineer of the XVIII Airborne Corps at Fort Bragg, North Carolina) is indispensable.

Developing a clear, well-considered support relationship between the engineer unit and the maneuver unit with which it will operate is critical in determining the logistics support the engineer unit will receive. Unfortunately, deciding on a support relationship is often a casual decision.

Before determining the support relationship, engineer and CSS planners must weigh the ability of the maneuver unit to provide support to the engineer unit, the CSS assets in theater, and the scale of future operations. When engineer units are attached, it often will be necessary to augment the divisional CSS structure. However, that creates an inherent inflexibility: Once engineer forces are attached and the requisite CSS adjustments are made, changing the support relationship becomes a more complex matter.

Anticipating requirements is part of the engineer planner's job. Engineer class III (POL), IV, V (ammunition), and IX (repair parts) requirements must be identified as soon as possible. If the engineer unit waits to request its logistics requirements until after it receives its mission, it will be too late to influence a normally strapped logistics pipeline and will experience unnecessary delays. An engineer planner at the highest level possible needs to stress the system to produce support so it reaches the engineers as they need it. Examples of the support vital to engineer forces are forward POL supplies on main supply routes, barrier and construction materials, and special breaching and demolition munitions. Prepackaged, combat-configured loads—such as the packaged unit loads configured for light infantry divisions—will speed this process.

Engineer and CSS Planning Guidelines

Throughout the engineer community, engineer planners must be thoroughly familiar with support requirements and the capabilities of available CSS assets. Here are several planning guidelines for engineer planners to follow—

Don't be "ops only" in planning at brigade level and above. The case can be made that logistics considerations, more than operational considerations, will dictate engineer operational tempo. Problems normally arise when engineer "operators" force-feed insupportable plans that dwarf the capability of the available CSS assets. For example, class IV intensive construction can be well planned but impossible to execute unless the necessary transportation is available.

Clarify engineer support relationships to ensure that the CSS units not only know that they will support engineer forces but are knowledgeable about the magnitude of that support. The area support group concept is fine as long as the group is robust enough to facilitate a free flow of engineers across the battlefield.

Ensure maneuver staffs have a clear understanding of requirements. Experience has shown that, though well intentioned, most maneuver staffs—especially in light forces—fail to grasp the extent of engineer logistics requirements. They must understand clearly that extensive engineer work will normally require dedicated CSS assets that will have to be diverted from other activities.

Get special logistics requirements into the flow of requests early. Early identification of logistics requirements will aid engineer units down the line by helping them to synchronize their efforts with the logistics flow. Even if the initial requirements are an "engineer estimate" that needs to be modified later, getting the train started is what is important.

Look for host nation support as early as possible.

Thinking about local support is normally limited to POL and water. However, local building materials and contract haul assets can aid the engineer logistician and yield more responsive support. Host nation support is a valuable asset, and information about what the host nation can offer—including the locations of building materials, quarries, manufacturing plants, and power sources—must become part of the commander's priority information requirements.

A Case Study: Cap-Haitien

An example of nondivisional engineers operating apart from their parent unit is the experience of the 37th Combat Engineer Battalion (Combat) (Airborne), 20th Engineer Brigade, during Operation Uphold Democracy in Haiti. The battalion operated as part of Task Force (TF) Castle in direct support of a brigade combat team from the 10th Mountain Division (Light Infantry). From 26 September to 11 November 1994, the Eagle Battalion operated as part of a combined arms team at the extreme end of well-extended logistics lines. In the austere environment at Cap-Haitien on Haiti's northern coast, the battalion succeeded in executing an ambitious mission that included force protection and construction of a parking area for C-130 transports and two 1,000-soldier base camps.

The bulk of TF Castle operated in the Port-au-Prince area (Port-au-Prince is the capital and largest city of Haiti) and received support from the 264th CSB of the 46th Corps Support Group (CSG). Under the direction of the Logistic Support Command, these units provided direct support to the task force, with the TF S4 interfacing directly with the 46th CSG and 264th CSB.

It was evident that engineer forces operating outside the Port-au-Prince area would need to draw support through local support units. For the 37th Combat Engineer Battalion, this meant that support would come from the 10th Mountain Division's 210th FSB, which was augmented by elements of the 189th CSB. Combined, these units were able to provide class I (subsistence), II (clothing and individual equipment), III, VI (personal demand items), and VIII (medical material). These commodities were not unique to the engineers, but planning was needed to ensure that the FSB and CSB were aware of the scale of the support the engineers would need. For example, the 37th Battalion's requirement for nearly 3,000 gallons of JP5 fuel per day (under the single fuel concept) dwarfed the normal requirements of the brigade combat team. The CSB therefore ensured that additional POL storage capacity was on hand.

Since Uphold Democracy was conducted in a permissive environment, there was no need to provide class V in excess of the ammunition basic load. However, it was necessary to modify the class V push package to include engineer-related munitions requirements, particularly demolitions and mines. Although the need for munitions was not tested because there was no combat, all indications are that this supply effort was successful.

Support for class IV posed a particular problem that required extensive planning. The roads from Port-au-Prince to Cap-Haitien were nearly impassable for convoys of any sort. Since the only support to Cap-Haitien arrived by C-130 transports and landing craft, utility (LCU's), coming from Port-au-Prince, moving the sheer density of class IV materials necessary for constructing the base camps required special consideration. The camps required nearly 5,000 sheets of plywood (3/4 inch by 4 feet by 8 feet) and almost 20,000 pieces of lumber (2 inches by 4 inches by 8 feet). The 210th FSB stated up front (as did the 46th CSG at Port-au-Prince) that it would be unable to handle this requirement. In this instance, the parent unit had to provide support directly. It was left to the TF Castle S4 staff to acquire and coordinate transportation for all class IV going to Cap-Haitien. This translated into a major effort that moved over 1,800 short tons, primarily by LCU, over a 2-week period.

Predictably, class IX was another area where the engineer logisticians needed to become directly involved. The maintenance infrastructure in the FSB could not absorb engineer class IX requirements, especially for low-density equipment. Despite predeployment planning, the engineers had to provide for the majority of their own repair parts.

Engineers have unique requirements that demand imaginative solutions. Engineer planners must be well versed in support requirements, interface with maneuver and CSS units, and assess the capabilities and responsiveness of supporting units. The critical nature of class IV, V, and IX items makes them areas of special concern that require particular attention. Numerous options for supporting the engineer force exist. The engineer planner must work with the CSS planner as closely as with the operational planner to provide seamless support that will ensure engineers continue to serve as combat multipliers. **ALOG**

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Objective Supply Capability

by Major James C. Bates and Gregory W. Kropp

The objective supply capability (OSC), fielded by the Army in 1992, is an important technological advance that offers the supply community a significant increase in responsiveness of the supply system. OSC uses a centralized computer data base known as the *gateway* to store current asset records for most supply support activities (SSA's) in the Army. The gateway, located in St. Louis, Missouri, tracks items in stock and the number on hand at each SSA. OSC does not replace the current standard Army management information systems (STAMIS); instead, it augments these supply systems and improves their responsiveness.

The concept for OSC was developed in 1987 by Jeffrey Crisci and Gregory Kropp, co-author of this article, at the Strategic Logistics Agency (SLA) in Alexandria, Virginia, in an effort to improve supply responsiveness. (At that time, SLA was a staff support agency of the Office of the Deputy Chief of Staff for Logistics, Department of the Army. Its functions have now been combined with those of the Logistics Evaluation Agency, New Cumberland Army Depot, Pennsylvania, and the new activity has been designated the Logistics Integration Agency.)

According to the OSC Commander's Guide, the objectives of OSC are to—

- Reduce the order segment of the order and shipping time.
- Provide for lateral distribution of assets.
- Provide visibility of assets within a geographical area.
- Provide near real-time status to the user.
- Improve automation and communications.
- Create the image of a single supply system.

Current STAMIS supply software, such as the standard Army retail supply system (SARSS), direct support unit standard supply system (DS4), and standard Army intermediate level supply system (SAILS), depends on information batch-processing. Generally, each of these STAMIS programs takes at least 1 day to process a batch of information. The STAMIS software is based strictly on organizational supply hierarchy. If a divisional unit needs a repair part, it sends a request to its forward support battalion (FSB). If the FSB does not have the part, the FSB contacts its main support battalion (MSB). If the MSB does not have the part, it relays the request through the division materiel management center to its corps support command.

To access the new OSC, company-level units use the unit-level logistics system (ULLS), and direct support-level units use the standard Army maintenance system (the unit- and shop-level version known as SAMS-1). The ULLS and SAMS-1 operators bypass SARSS, DS4, and SAILS automation and send their supply requests, usually once a day, through a modem to St. Louis, where the gateway computer processes them. (Those SSA's that have received the new standard Army retail supply system-objective [SARSS-O] software have not been linked to the gateway yet but will be able to interface soon with a program currently being written.)

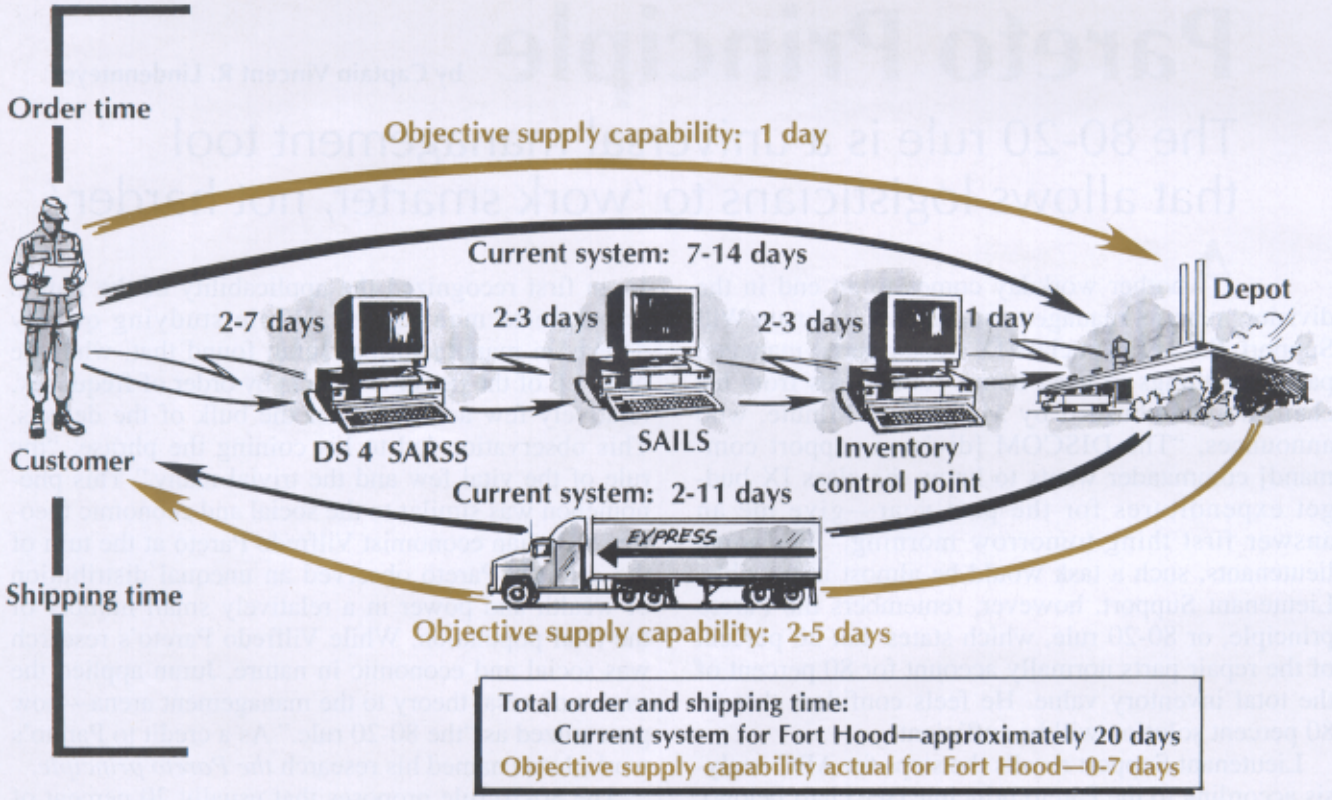
The requisitioner receives a near real-time response from the gateway (17 seconds on average) on whether the item is available at the SSA's in the surrounding area. Based on organizational and geographical considerations, parameters in the gateway establish which units are supported by each SSA.

For each repair part request, the gateway provides one of the following responses—

- "The item is in your normal supply support chain; go there to obtain it."
- "The item is not in your normal supply support chain, but it is available at another SSA located near your unit." (In this case, the gateway computer would instruct that SSA to produce a materiel release order authorizing transfer of the part to the requesting unit.)
- "The item is currently not available at an SSA in your area." (In this case, the gateway would pass the requisition to the wholesale item manager.)

Before OSC, a requester wouldn't know for days if his SSA had the part unless he hand-carried his request to the SSA, nor would he be able to get the part from an SSA outside of the established supply chain of support. Without access to a centralized data base, a nondivisional SSA located in the same vicinity as the requesting unit would not be tasked to provide the part even if it had it on hand. Using earlier supply systems software, it could have taken weeks for a requisition for a part unavailable at a nearby SSA to be submitted to the wholesale supply system.

With OSC, units are able to get parts from all the SSA's within a specified geographical area regardless of the existing supply chain of support. A unit using OSC receives almost immediate feedback on the



Comparison of flows between current system and objective supply capability

desired part's availability. The requester knows quickly if the part is available at his supporting SSA or at another SSA nearby. If the part is not available, a repair part request is submitted to the wholesale level the same day.

OSC and the SSA computer systems communicate data on a daily basis. The SSA computers inform OSC about their stockage levels, and the gateway updates the SSA's computers on requisitions processed outside of the normal supply chain.

The near real-time feature of OSC allows soldiers operating the ULLS and SAMS-1 computers to receive editing feedback at the same time their data are being transmitted. The gateway informs the soldiers of duplicate requisition numbers, invalid stock numbers, invalid unit-of-issue codes, and dollar thresholds, and tells them if an item must be procured locally. Without OSC, a soldier would not know that some of his requisitions were invalid until after a day or two of careful analysis of numerous coded reports.

OSC has decreased the time a unit must wait to receive a nonstocked item (order and shipping time) by nearly 2 weeks. The chart above compares requisition flow at Fort Hood, Texas, with and without OSC. With OSC, a customer can submit a requisition directly to the depot in as little as 1 day. Without OSC, the customer had to submit his requisition to SARSS and DS4, which took as long as 7 days. Another 7 days were required to send the requisition through SAILS to the inventory control point (ICP) and on to the depot.

Although there is no improvement in the time required to actually ship the item, OSC reduces the "order" portion of order and shipping time by up to 14 days. The improved responsiveness of the supply system and the resulting enhanced effectiveness of the soldiers on the battlefield have proven OSC a remarkable success. **ALOG**

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Pareto Principle

by Captain Vincent R. Lindenmeyer

The 80-20 rule is a universal management tool that allows logisticians to 'work smarter, not harder.'

Another workday comes to an end in the division materiel management center. Lieutenant Will Support, the assistant class IX (repair parts) manager, packs his things to head home. As he rises from his chair, he is ambushed by Major Less Minute, who announces, "The DISCOM [division support command] commander wants to know the class IX budget expenditures for the past year—give me an answer first thing tomorrow morning." For some lieutenants, such a task would be almost impossible. Lieutenant Support, however, remembers the Pareto principle, or 80-20 rule, which states that 20 percent of the repair parts normally account for 80 percent of the total inventory value. He feels confident that an 80 percent solution will be sufficient.

Lieutenant Support recalls the steps for ABC analysis according to the Pareto principle (see chart below). He obtains data from the integrated logistics analysis program, extracting the top 25 cost drivers, their national stock numbers (NSN's), and their total number of demands for the year. He then builds a spreadsheet based on the steps for ABC analysis. Lieutenant Support discovers that 9 out of the top 25 NSN's (36 percent) account for over 75 percent of the total annual dollar expenditures. In just minutes, he has an answer for the DISCOM commander.

Pareto Background

In 1950, in *The Quality Control Handbook,* J.M. Juran first recognized the applicability of the Pareto principle to many fields. While studying quality defects in manufacturing, Juran found that, when he listed all of the possible defects by order of frequency, relatively few accounted for the bulk of the defects. This observation led to his coining the phrase, "the rule of the vital few and the trivial many." This phenomenon was similar to the social and economic theories of Italian economist Vilfredo Pareto at the turn of the century. Pareto observed an unequal distribution of wealth and power in a relatively small number of the total population. While Vilfredo Pareto's research was social and economic in nature, Juran applied the same universal theory to the management arena—now generalized as "the 80-20 rule." As a credit to Pareto's work, Juran named his research *the Pareto principle.*

The 80-20 rule proposes that usually 20 percent of the study population accounts for 80 percent of the measure under consideration (see chart on page 39). This universal rule is an effective management tool that produces valuable information in simple terms.

The Logistician and Pareto

The current Army focus is on maintaining readiness while rapidly changing the force structure and preparing for the 21st century. Reductions in inventory, decreases in repair times, and increases in mission requirements push managers to continually search for proven management tools. The following scenarios

Step 1: Select some criterion (for example, revenue, high turnover, annual cost).

Step 2: Rank items in descending order of importance according to the criterion.

Step 3: Calculate the item percentages and total the cumulative percentage.

Step 4: Assign items to groups below based on importance and cost.

Group	Size (percent)	Total Cost (percent)
A	10-20	60-80
B	20-30	20-30
C	60-80	10-20

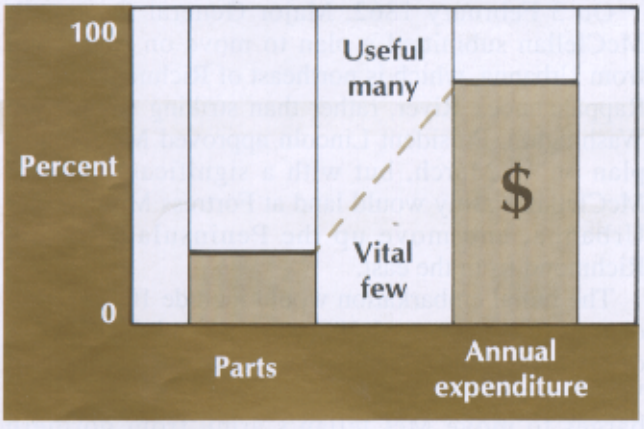
Steps for ABC analysis.

highlight the universal qualities of the Pareto principle that logisticians can apply in everyday situations.

A warehouse example. Denials are a constant concern for most warehouses. A denial occurs when a part is on hand according to documentation but cannot be located. The logistician begins causative research, recording the reasons for each denial's occurrence. As the study proceeds, a Pareto chart is developed to identify the reasons for denials and their frequency. The chart reveals that "keypunch error" is the explanation for the greatest number of denials. This justifies establishment of a training program on the correct procedures for entering automated receipt documents. Regardless of current procedures, personnel experience and training, or type of equipment used, Pareto analysis reveals systemic problems, their causes, and effects.

A transportation example. The transportation company commander for a main support battalion of a heavy division DISCOM is responsible for the division's direct support transportation assets. With over 100 vehicles to maintain, it is difficult to intensely manage every vehicle in the entire fleet. By performing a mission analysis, the commander finds that a mere 15 percent of the fleet (the M911 heavy equipment transporters that move Bradley fighting vehicles and M1 tanks to gunnery) performs as much as 90 percent of mission support. With this information, the commander can "work smarter and not harder" in focusing unit supply and maintenance activities on the critical vehicles of the fleet.

A class IX example. Major engine assemblies and components of combat systems and major end items normally fall into groups A and B. These items are managed at the warehouse supervisor level in the DISCOM. Knowledge of items in groups A and B helps supervisors make decisions on security of parts, stockage quantities, reorder points, and requisition tracking. However, there is a tendency to neglect low-cost parts that, for no other reason, would be in group C. Some group C candidates may complement a group A or B item, which increases their importance far more than their cost (for example, some nuts and bolts associated with a major component). Although many of these low-cost parts are easily fabricated, a more proactive management system minimizes the distractions and increases the productivity of the fabrication section.



Pareto analysis of parts and annual expenditure.

Pervasive Pareto

Managers and logisticians alike recognize the Pareto principle as a viable technique to identify problems, prioritize issues, and help optimize systems. The Pareto principle is a tool that can effectively communicate the bottom line at any level, from section leaders to DISCOM commanders. It has application from the micro to the macro level.

The Pareto principle does, however, have its limits. Concentrating on the 20 percent that are the "vital few" today will allow decisions to be made today. As logisticians know, the automated environment of the logistics world requires intense daily management. A caveat to logisticians: The Pareto principle does not have a "magic" breakpoint at the 80-20 line but is simply a rule of thumb. Additionally, all 80 percent of the "trivial many" should not be disregarded. When taking action based on the Pareto principle, it should be remembered that some of today's "trivial many" may be part of tomorrow's "vital few."

In the meantime, logisticians should add the Pareto principle to their box of management tools. They should become accustomed to thinking with the whole system in mind, across functional boundaries, and not just in their own discipline or field. The Pareto analysis is a communication tool that can emphasize disparity, provoke a decision, and trigger action. Most importantly, the Pareto principle can help mold logistics processes into flexible and efficient systems ready to support the 21st century force. ALOG

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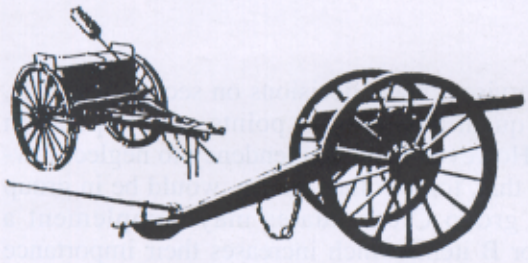


Union Logistics in the Peninsula Campaign

by Bruce P. Schoch

Logistics played a major role in the Union advance on Richmond in 1862, influencing the base of operations and the conduct, and ultimate failure, of the offensive.

A century and a quarter before Operations Desert Shield and Desert Storm, the United States Army engaged in another large-scale deployment into a hostile theater. Just as in Southwest Asia, nearly everything required for the mission had to be imported, and the enemy allowed the buildup to proceed without serious interference for several months. Unhappily, the operation did not end as well as the Persian Gulf War—nowhere near as well, unless you happened to be a Confederate defender of Richmond, Virginia.

This operation was the Civil War's 1862 Peninsula campaign in Virginia. Its roots lay, ironically, in continued Union control of a fortification designed by the great Confederate general, Robert E. Lee, and in a newspaper article.

Lee, while serving as a captain in the Army Corps of Engineers before the war, had supervised much of the construction of Fortress Monroe in Virginia. The massive masonry fort was designed to protect the mouth of the Chesapeake Bay from European naval marauders, such as the British who attacked during the War of 1812. It was this fort, at the eastern tip of the Peninsula between the York and James Rivers, that became the starting point for the Union movement toward the Confederate capital at Richmond in 1862.

Hampton, the city immediately outside the fort's moat, was burned on 7 August 1861 by the Old Dominion Dragoons of Elizabeth City County, Virginia, commanded by Captain Jefferson Phillips, on the order of Confederate Brigadier General John Bankhead Magruder. Magruder had read in the *New York Tribune* about the "Slabtown" that Union Major General Benjamin F. Butler, the commanding general of Fortress Monroe, was building in Hampton to house all the "contrabands" (freed and runaway slaves) who were flocking there. He feared that the Union Army would also use Hampton to provide winter quarters.

Hampton, which had been burned by the British in 1813, was just beginning to regain its economic vitality in 1861. Butler disclaimed any military appreciation of what he termed an act of barbarism, but Magruder's burning of the city did focus President Abraham Lincoln's attention on the Peninsula. It also forced the initial Union deployment to the Peninsula to be based at Fortress Monroe rather than upon the surrounding expanses of Hampton.

Initial Deployment to the Peninsula

On 3 February 1862, Major General George B. McClellan submitted a plan to move on Richmond from Urbanna, which is northeast of Richmond on the Rappahannock River, rather than striking south from Washington. President Lincoln approved McClellan's plan on 13 March, but with a significant change: McClellan's army would land at Fortress Monroe, not Urbanna, and move up the Peninsula to attack Richmond from the east.

The initial embarkation would include 100,000 soldiers, 15,000 horses, 1,100 wagons, and 44 batteries of artillery. John Tucker, the Assistant Secretary of War, chartered 113 steamers, 188 schooners, and 88 barges to move McClellan's army from northern Virginia down the Potomac River and the Chesapeake Bay to Fortress Monroe. The first vessels arrived from

seaports in the Northeastern States at Alexandria, Virginia, across the Potomac from Washington, on 17 March.

Lieutenant Colonel Rufus Ingalls, the acting quartermaster for the move, was conducting the largest deployment the U.S. Army had ever made. Over a 3-week period, the transports moved 3,600 wagons, 700 ambulances, 300 tubes of artillery, 2,500 head of cattle, and 25,000 horses and mules.

Four hundred five vessels totaling 86,278 tons—including 71 side-wheel steamers; 57 propeller-driven steamers; 187 schooners, brigs, and barks; and 90 barges—hauled an enormous tonnage of cargo for the Peninsula campaign to Fortress Monroe in the spring of 1862. The daily supply requirements were prodigious: 3 pounds of subsistence per man and 26 pounds of fodder per horse or mule; over 500 tons of rations and fodder and over 100 tons of all other classes of supply for the entire army.

Amphibious Operations and Support

The Mexican War landing of Major General Winfield Scott's army of 10,000 at Vera Cruz, Mexico, on 9 March 1847 was the first large amphibious operation planned and executed by Americans. There was little precedent for it. But the Army gained no subsequent experience in amphibious operations, and certainly not in what we now know as logistics over the shore.

Many of the watercraft used to support McClellan's Peninsula campaign were the same ones that had ferried his troops and supplies from the Washington area to Fortress Monroe. Other craft he used had even humbler origins: the flight of many of the contrabands down the James and York Rivers had left hundreds of canal boats (which had a draft of only 1 foot when empty) cluttering the Fortress Monroe waterfront. Lincoln proposed that these craft be beached at Willoughby Point, across the James from Hampton, and used as floating causeways and piers for disembarking troops at Norfolk in May. The subsequent advance up the York River toward Richmond used these watercraft again in much the same role.

As a result of lessons learned during the Peninsula campaign, the quartermaster fleet was eventually to consist of coal-fired ships displacing 900 to 1,100 tons and capable of speeds of 8 to 10 knots. They included some steam-driven, light-draft stern ferries built in Philadelphia. These ferries could carry a fully equipped battery of artillery, a wagon train, or a regiment of infantry and functioned as a very early form of landing craft.

Establishment of Logistics Base at White House

Major General Stewart Van Vliet, McClellan's quartermaster during the Peninsula campaign, noted that rain and mud made traffic very slow. He estimated that the army, then consisting of 130,000 troops, required 500 tons of forage and subsistence daily. On 15 May, the Navy cleared the James River of Confederate shipping; the York River was always clear.

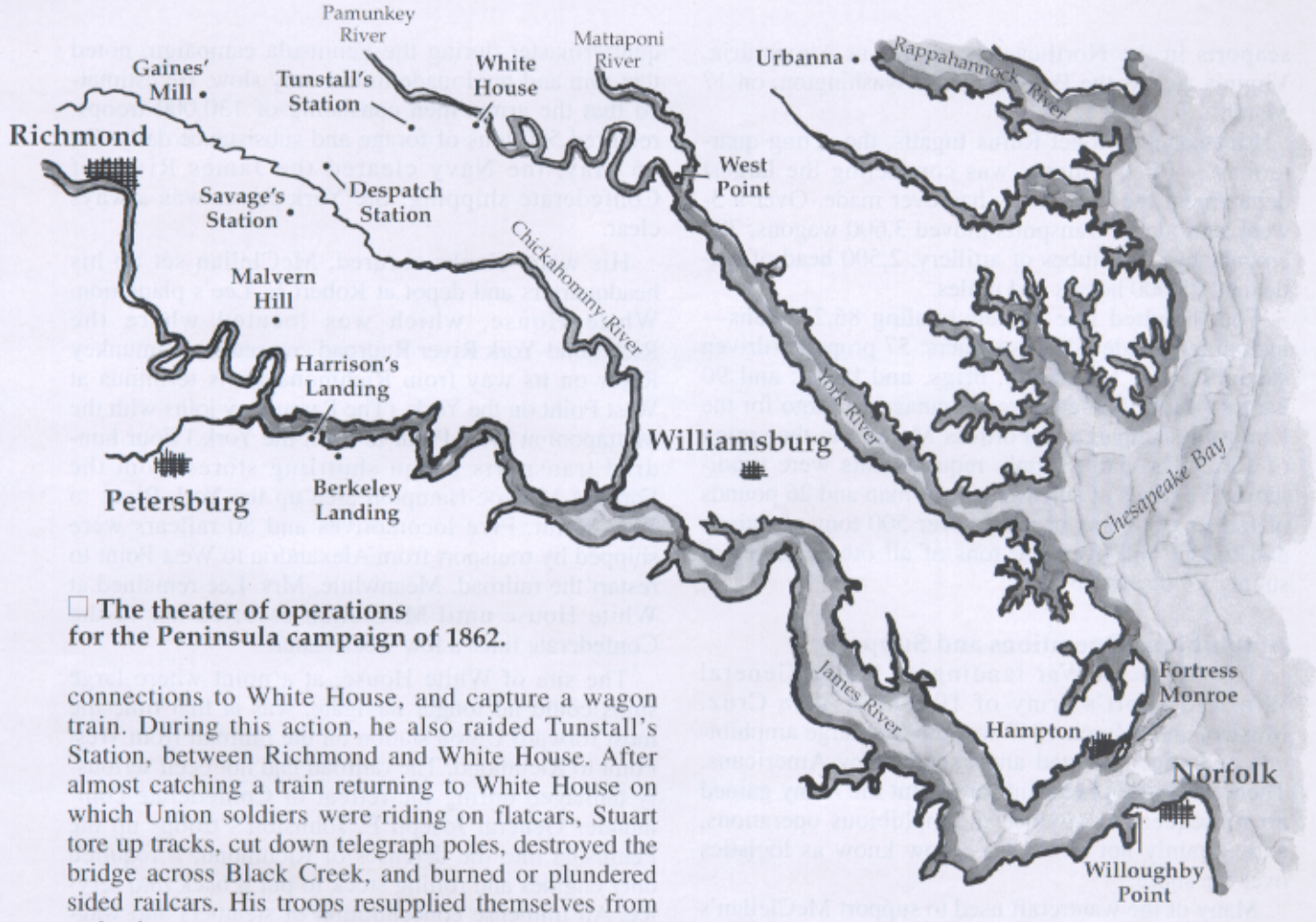
His water flanks secured, McClellan set up his headquarters and depot at Robert E. Lee's plantation, White House, which was located where the Richmond-York River Railroad crossed the Pamunkey River on its way from Richmond to its terminus at West Point on the York. (The Pamunkey joins with the Mattaponi at West Point to form the York.) Four hundred transports began shuttling stores from the Fortress Monroe-Hampton area up the York River to West Point. Five locomotives and 80 railcars were shipped by transport from Alexandria to West Point to restart the railroad. Meanwhile, Mrs. Lee remained at White House until McClellan escorted her to the Confederate lines a few weeks later.

The site of White House, at a point where large ships could no longer navigate, was at that time the most forward Union station on the railroad from West Point to Richmond. The railroad had not been seriously damaged during the retreat of Confederate commander General Joseph E. Johnston's troops up the Peninsula into the defenses of Richmond; it required only engines and rolling stock to put it back into service. An immense concentration of steamers and wagons combined to move all kinds of supplies forward and evacuate the sick and wounded.

The bulk of McClellan's army was south of the Chickahominy River, which divides the Peninsula before flowing into the James. They were therefore nearer the James than the York. Only the V Corps under Brigadier General Fitz-John Porter was centered around and based upon White House. Supplies from the White House-West Point area were transferred by wagon and rail to the units in the field. The railroad was a single line and was constantly threatened by washout, but its great advantage was that it ran straight to Richmond, the strategic objective of the campaign.

Confederate Appreciation of Union Logistics

The Confederates' concern about disrupting McClellan's supply lines manifested itself in a failed attempt on 1 June to drive the Union left wing into the Chickahominy and thus cut McClellan's line of communications from White House. Brigadier General J.E.B. Stuart's raid and ride around McClellan's army on 12-15 June managed to burn two transports at Garlick's Landing on the Pamunkey River, cutting



The theater of operations for the Peninsula campaign of 1862.

connections to White House, and capture a wagon train. During this action, he also raided Tunstall's Station, between Richmond and White House. After almost catching a train returning to White House on which Union soldiers were riding on flatcars, Stuart tore up tracks, cut down telegraph poles, destroyed the bridge across Black Creek, and burned or plundered sided railcars. His troops resupplied themselves from sutlers' stores.

Stuart did not press an assault on the supply base at White House because he reasoned that the defenses would be thoroughly alerted. However, his raid caused McClellan to change his supply base from White House to the James River.

Shift to Harrison's Landing

McClellan began relocating his supply operation and shifting his tactical focus south of the Chickahominy River within a week of Stuart's raid. On 18 June, he ordered 800,000 rations shifted from White House to the James River. Colonel Ingalls, in charge of the White House depot, dispatched several loads of forage and provisions to the James on 23 June. Canalboat and barge floating wharves on the York River were broken apart. Four hundred transports began shifting cargo from White House to the James.

In the meantime, Johnston had been wounded and replaced by Robert E. Lee as the Confederate commander. Lee counterattacked McClellan's army on 26 June, intent on driving the Union invaders away from Richmond. The ensuing Confederate offensive lasted until 1 July and became known as the Seven Days' Battles.

While struggling to repulse the attacking Confederates, McClellan began shifting his actual base of operations to Harrison's Landing on the James on the morning of 27 June. Contrabands were evacuated to Fortress Monroe on canal boats. Supplies not needed by the forces north of the Chickahominy during the switch of fronts were retrograded by wagon and rail to White House.

Van Vliet shipped supplies by wagon and rail to Savage's Station so advancing troops could resupply en route to Harrison's Landing. They destroyed excess stocks. Supplies at Orchard Station and Despatch Station were sent on to Savage's Station as well, and excess stocks were evacuated to White House. Some 2,500 cattle were herded across the Peninsula to the James.

Transports evacuated hundreds of sick and wounded. Cavalry screened the hospital while litters and ambulances evacuated the wounded. Gunboats (the *Commodore Barney, Currituck,* and others) stationed around the port complex at White House provided additional security. Commissary stores were evacuated by transports; the sutlers' supplies were looted by departing Union soldiers and advancing Confederates. Buildings, including White House itself, and rows of

tents were fired with whiskey-soaked hay. Ammunition dumps that could not be evacuated were blown up—the sounds convinced Confederate leaders that a full-scale Union retreat was in progress. Three locomotives and a hundred railcars were also burned. When all was done, Colonel Ingalls, now deputy quartermaster for the Army of the Potomac, and his staff boarded the transport *Circassian* and sailed to Fortress Monroe.

Following the Union retreat after the battle of Gaines' Mill on 27 June, wagoneers loaded all the supplies possible at Savage's Station for retrograde; the rest were destroyed. Meanwhile, Stuart arrived at White House in time to see the last gunboat leaving and nine barges, five destroyed locomotives, trains of railcars, and rows of tents burning.

Lee and his chief subordinate, Major General Thomas J. (Stonewall) Jackson, were both convinced after the main battle that McClellan would hold his lines of communication with White House. Stuart therefore ordered Brigadier General Richard S. Ewell's cavalry to attack White House. The cavalrymen saw fully loaded trains being run into the river with engines at full steam to avoid being captured by the Confederates. The finale of the entire operation was, fittingly, unusual: Stuart's horse artillery traded shots with the Union gunboat *Marblehead* at the very end of the evacuation from White House.

Aftermath

After the Seven Days' Battles, McClellan's equipment status at Harrison's Landing was 2,578 wagons, 415 ambulances, 5,899 horses and 8,708 mules. Colonel Ingalls reported on 20 July that the Army of the Potomac had 3,100 wagons; 7,000 cavalry mounts; 5,000 artillery horses; 5,000 draft horses; and 8,000 mules. He described its status thus: ". . . the Army was then perfectly equipped." Whichever benchmark is used, the logistician knows that the 1862 Peninsula campaign did not fail for want of support.

The impact of logistics upon the conduct of both Union and Confederate operations during the 1862 Peninsula campaign was significant. The buildup and sustainment of a huge Federal force before McClellan undertook any major combat operations forced his logisticians to move materiel on either muddy roads or the rivers. As the James River was still a contested waterway until the campaign was quite mature, that left the York River. The need—or the attraction—to use the railroad (and McClellan was a railroad president before the war) made the choice of White House as a logistics base eminently logical. The use of White House, however, put the main focus of sustainment north of the Chickahominy River. The Chickahominy became a major obstacle in the drive on Richmond, because the capital city was south of that river. Most of McClellan's army was also south of the Chickahominy after its advance up the Peninsula from Fortress Monroe.

The inherent cacophony and seeming chaos of a shift of base operations from White House to Harrison's Landing, coupled with an unexpected counterattack, appears to have distracted, paralyzed, and then panicked McClellan. Stuart's "ride around the Army" had convinced him that his supply base was too vulnerable; it was already slow in responding to the units south of the Chickahominy. His decision to move to Harrison's Landing, once the James River had been cleared by the Navy, was as logical as his original move to White House. That it occurred when Lee launched his counterattack was unfortunate; it conveyed the image of an Army in retreat, both to Lee and, ultimately, to a disoriented and distressed McClellan.

The Confederates were still expecting to encounter an operation based at White House when they attacked. They read the noise of the destruction of excess supplies as a sign of full retreat, instead of abandonment. Had Lee known that McClellan was relocating rather than retreating, he would probably still have attacked Porter's V Corps; but he probably would not have left as few troops as he did directly in front of Richmond. His counterattack probably would not have been decisive in ending the Union offensive. The subsequent slaughter of the useless Confederate attacks at Malvern Hill, just northwest of Harrison's Landing, on 1 July probably would not have occurred. The campaign could have resulted in a drawn battle, a continued slow Federal advance toward Richmond, and the beginning of siege warfare in 1862 instead of 1864. As to the long-term effect on the war, however, we can only speculate. **ALOG**

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