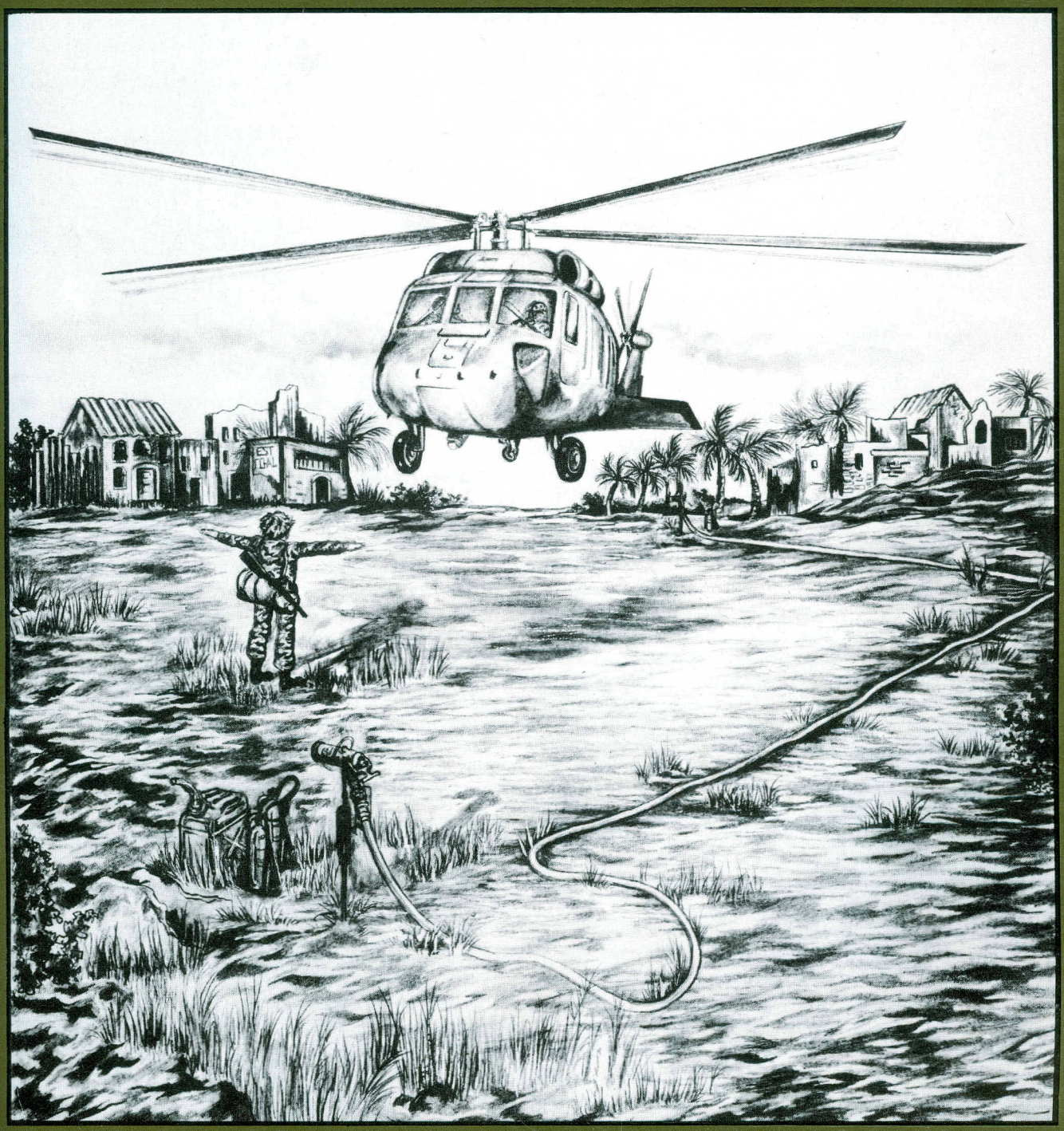
Quartermaster

PROFESSIONAL BULLETIN

SUMMER 1991 PB 10-91-2



SUPPORTING CONTINGENCY OPERATIONS

uarters, Department of the Army

This Publication Is Approved For Public Release; Distribution Is Unlimited

FROM THE EDITOR

We have just witnessed the results of a logistics effort unprecedented in history. This effort was so vital, and so successful, that General H. Norman Schwarzkopf, architect of Operation Desert Storm, felt the need to single out all the logisticians for a job well done. But bringing the troops home will prove just as much a logistical feat as putting them in. For the soldiers of the Quartermaster Corps there is no time to sit back. Rest assured that your contribution has not gone unnoticed. Responsive supply support ensured victory. Continued support ensures a quick return. Keep it coming!

While most of us remain concerned with the here and now, the Directorate of Combat Developments here at Fort Lee, VA, has remained targeted on the future.

Elsewhere in the Army, work continued on shaping the force of the Nineties - and beyond. This issue highlights some of the specifics in the support of contingency operations. In the Special Feature section, James S. Emery offers an overview of what supporting contingency operations will mean. He and MAJ Sarah Satterfield give the logistician a new way to approach logistics planning in **A New Tool for the Logistics Planner**. As we saw in Saudi Arabia the wave of the future is contingency contracting. But what are the specifics? Conrad I. Brown provides some answers in **Contingency Contracting**. Rounding out the Special Feature section are two articles on supply. CPT Melinda C. Litman spells out where we are and where we're going in **Water Support - The Future Begins Here**. Conrad I. Brown offers some background on our new mission of **Map Supply for the Army in the Field**.

One of our early problems in the desert was the lack of water support in the active force structure. This won't be an option in the future. CPT Brett D. Weigle proposes a very workable solution in **Complete Water Support For the Force**.

One of our more recent contingency operations was Operation Just Cause in Panama. There is still much to be learned from that operation, and we'll pass on some of those lessons here. CPT Mark E. Drake's **Panama Journal** is history as it happened. He kept a diary that has something to say about anticipation, improvisation, flexibility and innovative thinking. LT Edward A. Welch was the petroleum platoon leader in the 193d Support Battalion during Just Cause. In his **Fuel Support for Just Cause**, he comes out in support of "wet wing" refueling operations as *the* way to support aviation in areas like Panama. CPT Robert J. Gaddis, a company executive officer during Just Cause, summarizes the logistics and tactics of moving supplies forward in **CSS Lesons From Operation Just Cause.**

In **Support Operations Planning - A Technique**, CPT William E. Morris demonstrates how the logistics overlay can help drive the planning process. Some of a unit's most realistic training comes from rotations at Army training centers, according to CPT James E. Davis, Jr., and LT David M. Hammons in **Combat Service Support - The Critical Link**.

Whatever the future brings, the "nuts and bolts" of the Army will remain training and leadership. To complete this issue we have articles on each. Armywide, a new strategy is being developed which will simplify the planning and execution of our training. In **CATS on the Horizon**, CPT Eddie B. Williams of the Directorate of Training and Doctrine here at the Quartermaster School, introduces CATS (Combined Arms Training Strategy). Anything that simplifies training planning cycles is bound to be welcome in the field. CATS simplifies the planning process by tying it all together and cross-referencing requirements. CSM Bobby L. Casto is the Commandant of the Quartermaster Noncommissioned Officer Academy. In a time of shrinking budgets can we really afford NCO Academies? CSM Casto asks **Should We Retain the Academy**? and highlights the consequences of *not* having NCO Academies. The smaller Army will require quality and commitment from each and every soldier. In an effort to get more out of every soldier, you'll see that less is not more. In **Leadership Counseling**, CPT John M. Paul offers his input on how to develop and monitor a unit counseling program. An important leadership task - often neglected. Input to the soldier on performance and improvement is the core of leadership.

-MPG

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official: **PATRICIA P. HICKERSON**
Colonel, United States Army
The Adjutant General

Distribution: Special

Quartermaster
PROFESSIONAL BULLETIN

THE QUARTERMASTER GENERAL
Major General Paul J. Vanderploog
EDITOR-IN-CHIEF
COL John E. Dawley, Jr.
MILITARY EDITOR
CPT Michael P. Gilroy
EDITOR
Linda B. Kines
EDITORIAL ASSISTANT
Judy A. Charlotte
GRAPHICS, PHOTOGRAPHIC SUPPORT
TASC, Fort Lee, Virginia

The *Quartermaster Professional Bulletin* (ISSN 0896-9795) is published quarterly by the U.S. Army Quartermaster Center and School, Fort Lee, VA. This publication presents professional information, but the views expressed herein are those of the authors, not the Department of Defense or its elements. The content does not necessarily reflect the official U.S. Army position and does not change or supercede any information in other U.S. Army publications. Use of news items constitutes neither affirmation of their accuracy nor product endorsement.

The *QMPB* reserves the right to edit material. Use of the third person pronoun "he" and any of its forms is intended to include both masculine and feminine genders. All photographs are official U.S. Army photographs unless otherwise credited.

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

The *QMPB* will print only materials for which the U.S. Army Quartermaster Center and School has proponency. That proponency includes systems and doctrine that provide major end items; repair parts; water; petroleum; individual and organizational clothing and equipment; personal demand items; storage and distribution of maps; fortification and barrier materials; materiel to support military and nonmilitary programs; field services including laundry and bath, clothing exchange, bakery, fabric repair, graves registration, classification, reclamation, salvage and property disposal; parachute packing, maintenance and aerial delivery; training for all specialty code (SC) 92 officers, area of concentration (AOC) 920A, 920B, 921A and 922A warrant officers and Career Management Field (CMF) 76,77 and 94 enlisted soldiers; post exchange and commissary support; Quartermaster functions in multifunctional logistics units; and the logistics, history and leadership of Quartermaster units.

Material may be reprinted if credit is given to the *QMPB* and the author, except where copyright is indicated.

3 **Beginning the Real Work**
Major General Paul J. Vanderploog

SPECIAL FEATURE - SUPPORTING CONTINGENCY OPERATIONS
Directorate of Combat Developments, Fort Lee, Virginia

4 **Support of Contingencies - The Real Challenge**
James S. Emery

6 **Contingency Contracting**
Conrad I. Brown

9 **A New Tool for the Logistics Planner**
MAJ Sarah Satterfield James S. Emery

13 **Water Support - The Future Begins Here**
CPT Melinda C. Litman

17 **Map Supply for the Army in the Field**
Conrad I. Brown

GENERAL ARTICLES

19 **Complete Water Support for the Force**
CPT Brett D. Weigle

24 **Fuel Support for Just Cause**
LT Edward A. Welch

28 **Panama Journal**
CPT Mark E. Drake

36 **CSS Lessons From Operation Just Cause**
CPT Robert J. Gaddis

40 **Support Operations Planning — A Technique**
CPT William E. Morris

44 **Combat Service Support — The Critical Link**
CPT James E. Davis, Jr. LT David M. Hammons

48 **Leadership Counseling**
CPT John M. Paul

51 **Should We Retain the Academy?**
CSM Bobby L. Casto

53 **CATS on the Horizon**
CPT Eddie B. Williams

2 **Coming in the QMPB**
2 **Directory**
57 **Professional Readings**
54 **Safety**
58 **Quartermaster Update**

DISTRIBUTION: Approved for public release. Distribution is unlimited.
POSTMASTER: Official postage paid at Petersburg, Virginia 23804-9998, and other mailing offices.

Coming In The QMPB ...

Coming up in the next edition of the *QMPB*, we'll focus on supply support at brigade and below. More of the Army is focused on this level than perhaps any other. As the Army downsizes and the brigade becomes ***the*** basic tactical unit, no other area of our mission will assume greater importance than supply support at this level. Several articles have been submitted on supporting "where the rubber meets the road," and we'll bring them to you. As always, we'll have the latest news in the Corps in the Quartermaster Update section.

DIRECTORY - Points of Contact

Fort Lee DSN prefix: 687
Commercial prefix : (804) 734-XXXX

Editorial Offices

Editor-in-Chief
COL John E. Dawley, Jr. 3530

Military Editor
CPT Michael P. Gilroy 4382

Editor
Linda B. Kines 4382

Editorial Assistant
Judy A. Charlotte 4382

MAILING ADDRESS:
Quartermaster Professional Bulletin
ATTN: ATSM-QMG-B
Fort Lee, VA 23801-5032

ARTICLE SUBMISSIONS:
Submit articles in the form of typewritten (or near letter quality), double-spaced drafts consisting of no more than 12 pages. Articles may also be submitted on 5 1/4 or 3 1/2 inch floppy disk in most common word processing software as well as ASCII format. Hard copy must be included. Please tape captions to any photographs or diagrams included.

INDIVIDUAL DISTRIBUTION:
The *QMPB* is mailed free of charge to all Quartermasters in the rank of master sergeant and above. Soldiers can ensure receiving their individual copies by keeping their addresses on their officer record brief/enlisted record brief up to date.

UNIT DISTRIBUTION:
Report delivery problems, changes of address or unit designation to Judy A. Charlotte at DSN: 687-4382 EXT 8507. Requests to be added to free distribution should be in the form of a letter to the Military Editor.

QUARTERMASTER HOTLINE:
The Office of Evaluation and Analysis maintains a hotline to provide assistance on technical, doctrinal and training matters and response to inquiries regarding other Quartermaster proponent areas. DSN: 687-3767, Commercial: (804)734-3767, Toll free: 1-800-554-4570 outside Virginia or 1-800-552-4820 within Virginia.

U.S. Army Quartermaster Center

The Quartermaster General MG Paul J. Vanderploog	(ATSM-CG) 3458
Assistant Commandant COL Michael R. Devine	(ATSM-AC) 3759
Chief, Office of the Quartermaster General COL John E. Dawley, Jr.	(ATSM-QMG) 4237
Command Sergeant Major CSM Milton B. Hazzard	(ATSM-CSM) 3248
Petroleum and Water COL Ronald V. Bila	(ATSM-PWD) 2981
Directorate of Combat Developments COL Thomas C. Hill III	(ATSM-CD) 2832
Directorate of Training and Doctrine Dr. Darl McDaniels	(ATSM-DT) 4644
Office of Evaluation and Analysis Mrs. Arlene R. Barkley	(ATSM-OEA) 5769
Airborne and Field Services LTC David L. Shaw	(ATSM-ABN-FS) 2938
Supply and Professional Development LTC Richard B. Gilmore	(ATSM-SUP) 2425
Army Center of Excellence, Subsistence LTC John Q. McNulty	(ATSM-CES) 2950
Mortuary Affairs Center LTC Thomas O. Rexrode	(ATSM-MA) 3831
23d Quartermaster Brigade COL Edward W. Phelan	(ATSM-TPC) 1878
Noncommissioned Officer Academy CSM Bobby L. Casto	(ATZM-SGA-C) 3738

DESERT STORM - QUARTERMASTER MISSIONS CONTINUE

Major General Paul J. Vanderploog

The end of Operation Desert Storm provides a time for reflection....As we celebrate the historic victory of our armed forces in Operation Desert Storm, let me take a moment to express my pride in all the soldiers of our Corps. Those who deployed to the Middle East and others, who made the likewise significant contributions to training deploying soldiers and sustaining global readiness elsewhere, all proved that quality logistical support plays an ever-increasing role in combat operations. The swift and decisive victory won by the coalition forces is a testament to the hard work and dedication of Quartermasters everywhere. We were trained and ready to provide this support on a continuous basis. The victory in the Middle East would have been an impossibility without the men and women of our Corps. The ability to execute supply support operations throughout the campaign grew from the continued high state of training our units maintained.

Operation Desert Storm challenged our Corps to support a large-scale contingency force deployment. It also pointed out shortcomings in our force structure, and we intend to make adjustments. Most importantly, our performance reinforced the relevance of maintaining a high state of readiness by training to standard. During our quest to do even better, let's not forget that Operation Desert Storm validated much of what the Army and the Quartermaster Corps have been working on for the last 10 years and showed that we were on target. Procurement decisions made years ago were shown to be sound. Support and tactical doctrine written for a war in Europe against a numerically superior enemy proved its worth in the desert - against a numerically superior enemy.

Now is not the time to rest on our laurels. Our water support system requires some fixes. Our contracting system demonstrated its flexibility, and now we have to conduct training and get the word out on "contingency" contracting. We need to ensure that, as the Army builds down, we aren't gutting our support arm. As the national strategy changes in order to support contingency operations, there must be the ability to sustain a contingency Corps with all commodities contained in the active force.

The magnificent job done by the Active Army, U. S. Army Reserve and Army National Guard proved that the Total Army team is capable of supporting any operation anywhere in the world. One of our strengths as an Army and as a nation is the ability to be critical of ourselves. This self-examination guarantees self-improvement. We are already beginning to see some of the lessons learned from Operation Desert Storm incorporated into doctrine being written for the future. There is still an abundance of work ahead.

Our daily mission continues, both in Southwest Asia and around the world. Redeployment, replenishment of depleted stocks, and aid in the rebuilding of a nation - these tasks rest squarely on our shoulders. Our work began before deployment, continued during the operation and will continue long after the redeployment of combat troops. I count on each and every one of you to put your best effort behind the task ahead. It is no less important than what you have just accomplished. We must continue to train to standard, as we update doctrine and bring on new equipment and procedures....This will ensure our readiness and sustain operations around the world.

The mission of sustainment we now face is not unlike the missions faced by our predecessors: the Civil War, Spanish-American War, both World Wars, Korea, Vietnam, Grenada and Panama. All highlighted our skills - now the curtain has risen again. We are the heirs to a proud tradition. I know that all of you will continue to demonstrate the dedication and devotion to duty that has made us the Sustainer of Armies Since 1775.

MG Paul J. Vanderploog is the U.S. Army Quartermaster General.

SUPPORT OF CONTINGENCIES - THE REAL CHALLENGE

James S. Emery

Work is underway to refine the supply and services support concept for the echelons above division (EAD) to include support to contingency operations. This is where the real challenge begins. Not only is the real sustainment potential of the Army located in the corps, but it is here that real flexibility, "tailorability" and deployability must be built into combat service support (CSS) units. These CSS units must be quickly task-organized to support low-intensity conflict as well as mid-to high-intensity conflicts. We must understand that being prepared for one type of conflict does not necessarily equate to being prepared for another. The reality of the 90s, and the years beyond, is that forward deployed forces will be very limited in most cases. Therefore, we will need to "tailor" and "deploy" before we "employ" these forces. In many cases, these forces will not be combat-heavy. Once the supply and services concept for contingency operations is fully defined, work will begin on structuring Quartermaster units that can effectively provide the required support. This offers unique challenges and opportunities, not only for the Quartermaster Corps but the Army as well.

AIRLAND OPERATIONS CONTINGENCY

Under AirLand Operations, we are moving away from forward deployed forces and toward forces based in the continental United States (CONUS). Our focus will emphasize force projection and deployability. Since we must usually deploy forces before we employ them, contingency planning and its corollary, time-phased deployment lists, will become even more important. One of our major problems in the past has been tailoring support packages to deploy at approximately the same time as the combat forces to be supported. This problem will become even more apparent under AirLand Operations because all sustainment above brigade level must come from the corps. In the past, when a brigade element deployed, a portion of the main support battalion (MSB) routinely deployed with it. With the MSB no longer available under AirLand Operations, this sustainment slice, by default, falls on the

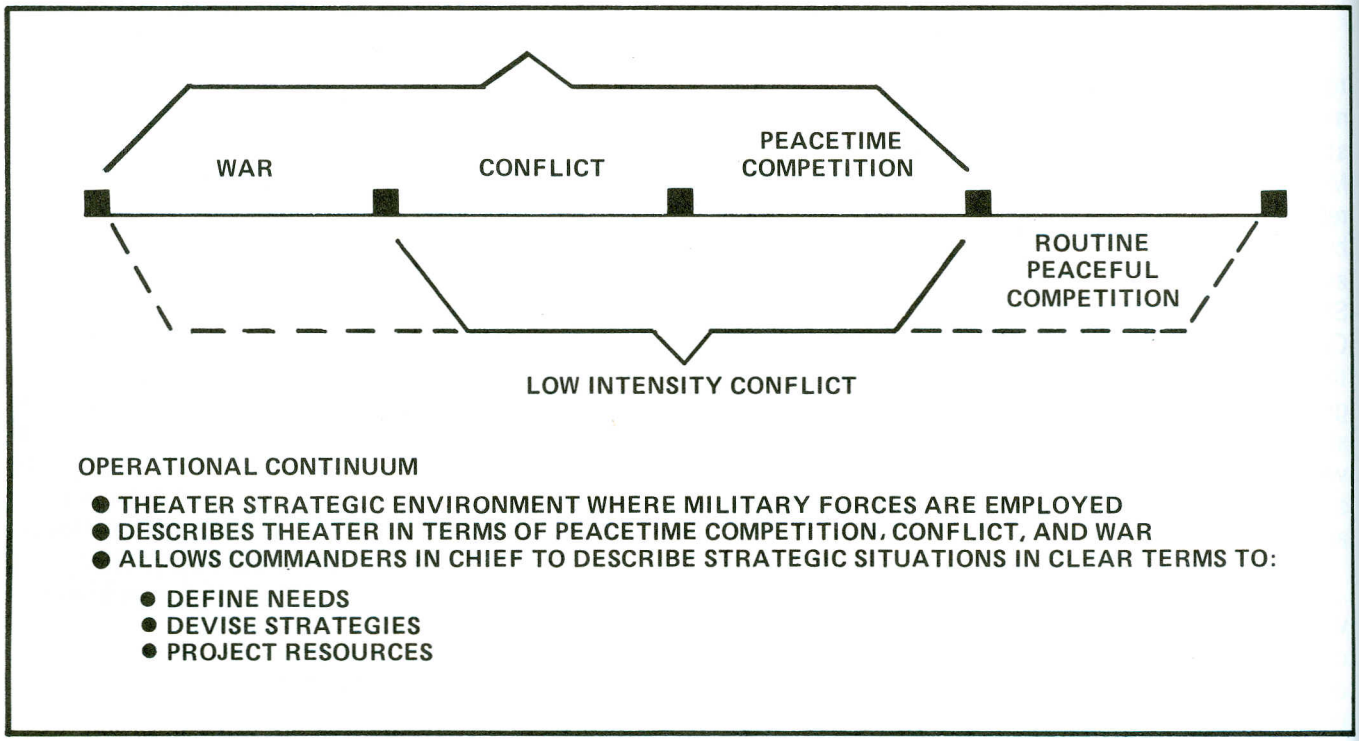


Figure 1. Operational Continuum

corps.The size of the CSS building blocks creates some problems in putting together an efficient, economical support package. LTC Gilbert S. Harper alluded to these problems in his June 1990 article in *Parameters* titled "Logistics in Grenada: Supporting No-Plan Wars." In his conclusions, LTC Harper said, "Operation Urgent Fury was a success but, as with other no-plan operations that preceded it, logistic support was unwieldy and inefficient. " This indicates a need for a revision in the size and focus of the EAD CSS building blocks.

Joint Chiefs of Staff (JCS) Test Publication 3-0 (Doctrine for Unified and Joint Operations), as well as the AirLand Battle-Future operational concept, spoke to the need to structure forces with the ability to operate across an operational continuum of three general states: peacetime competition, conflict and war.

Peacetime Competition: National objectives are achieved by political, economic, informational and military measures short of combat operations or by support to warring parties. Examples: peacekeeping operations (United Nations Forces in the Sinai); joint training exercises to show resolve (Team Spirit in Korea); nation-building activities (Task Force Bravo, Honduras); disaster relief and humanitarian assistance (Hurricane Hugo in Charleston, SC); and show of force (Operation Desert Shield in Saudi Arabia).

Conflict: An armed struggle between organized parties within a nation or between nations in order to achieve limited political or military objectives. Conflict is further defined as often being prolonged, confined to a restricted geographic area, and limited in weaponry and level of violence. Limited objectives may be achieved by the short, focused, direct application of force. Example: Operation Urgent Fury (1983 incursion into Grenada to rescue students) and Operation Blast Furnace (a short drug suppression operation in Bolivia in summer 1986).

War: Sustained use of armed force between nations or organized groups within a nation involving forces in a series of connected battles and campaigns to achieve vital national objectives. Example: Operation Desert Storm in Southwest Asia.

SUPPORT ACROSS THE OPERATIONAL CONTINUUM

Perhaps the major challenge we will face is developing units that can provide support during peacetime competition, conflict and war. (See Figure 1. Operational Continuum.) This becomes increasingly important when we consider that the future Army will be much smaller and therefore must adapt single organizations to perform multiple roles. As we move into the 21st Century our most likely scenario will probably have combat support (CS) and CSS units used extensively at the lower end of low-intensity conflict (LIC): peacetime competition. The primary mission of these support units would be to demonstrate the concern of our government by reestablishing essential services in an area. Assistance may consist of distributing food, water and supplies (CSS) as well as removing debris, rebuilding buildings and restoring utilities (CS). The bottom line is that we cannot over emphasize the need for CS and CSS units, particularly in the lower end of LIC.

On the other hand, we cannot ignore the fact that events could change and force our nation into conflict or war. Therefore, we must be able to rapidly tailor support organizations to meet the needs of fighting forces. Instead of focusing on services, there will be a need to deploy/employ support organizations for all classes of supply and services. To logistically support the operational continuum, it is imperative to have CSS force designs (building blocks) that are highly "tailorable" to form efficient and economical logistical support packages on short notice. Force design will be the real challenge as we begin to work out the details for our EAD support to AirLand Operations.

In summary, we can see that it is a delicate balancing act to structure forces that can support the Army in the field at both extremes. However, we accept and are ready to execute the challenge. The war fighting concept, AirLand Operations, is developing at a rapid pace. AirLand Operations presents some unique logistics challenges and opportunities. AirLand Operations will provide us with a Quartermaster Corps that is totally responsive to the many unique demands the Army will face in the 21st Century.

James S. Emery is a Military Analyst with the Concepts and Studies Division, Directorate of Combat Developments, U.S. Army Quartermaster Center and School, Fort Lee, Virginia. He has 22 years of active service with the Army and 8 years of civil service. He has attended the Logistics Executive Development Course, Fort Lee, Virginia, and the Command and General Staff College, Fort Leavenworth, Kansas.

CONTINGENCY CONTRACTING

Conrad I. Brown

The roles and missions of the U.S. Armed Forces are changing. In strategic terms, reliance on established, forward-deployed heavy forces keyed to a European land war has diminished. In its place has arisen a more flexible approach to what has been described as the "new world order." U.S. forces have deployed recently to areas of the world outside of existing theaters. Trends in world events suggest such operations will become more likely in the future. This article discusses one important aspect of the support required for such "contingency deployments" and one important part you might play in this area.

Our recent experience with contingencies have involved military and other public, joint or allied elements. Contingencies have been, or may be, caused by natural disaster, terrorist or subversive activities, collapse of law and order, or political instability. Military contingencies also can include demonstrations of force, raids, rescue missions and larger operations to protect U.S. interests, lives and property. The scope and size of these deployments can vary widely, as illustrated by Operation Urgent Fury in Grenada and Operation Desert Shield/Storm in Southwest Asia.

Meeting contingencies requires planning, rapid response, flexible procedures and an integration of efforts. An important factor in the conduct of these deployments has been the use of contingency contracting by U.S. forces to provide various supplies and services.

What is Contingency Contracting?

According to the Department of Defense Dictionary of Military and Associated Terms (Joint Publication 1-02), contingency contracting is "Contracting performed in support of a peacetime contingency in an overseas location pursuant to the policies and procedures of the Federal Acquisition Regulation System." More simply stated, contingency contracting is the capability to purchase locally essential goods and services to support a deployed force.

Contingency contracting is sometimes incorrectly equated with host nation support (HNS). As presented here, contingency contracting most often means face-to-face contact with foreign national business firms or individuals who are providing the supplies or services and who are paid directly by U.S. forces. HNS, on the other hand, may provide similar supplies and services, but the payments are usually made at the level of U.S. government to host government. You can expect to see either or both types of support used during a deployment.

A key element of the contingency contracting process is the need to separate the contracting and disbursing functions. While close cooperation between contracting and finance personnel must be maintained, this separation of functions helps ensure a system of checks and balances.

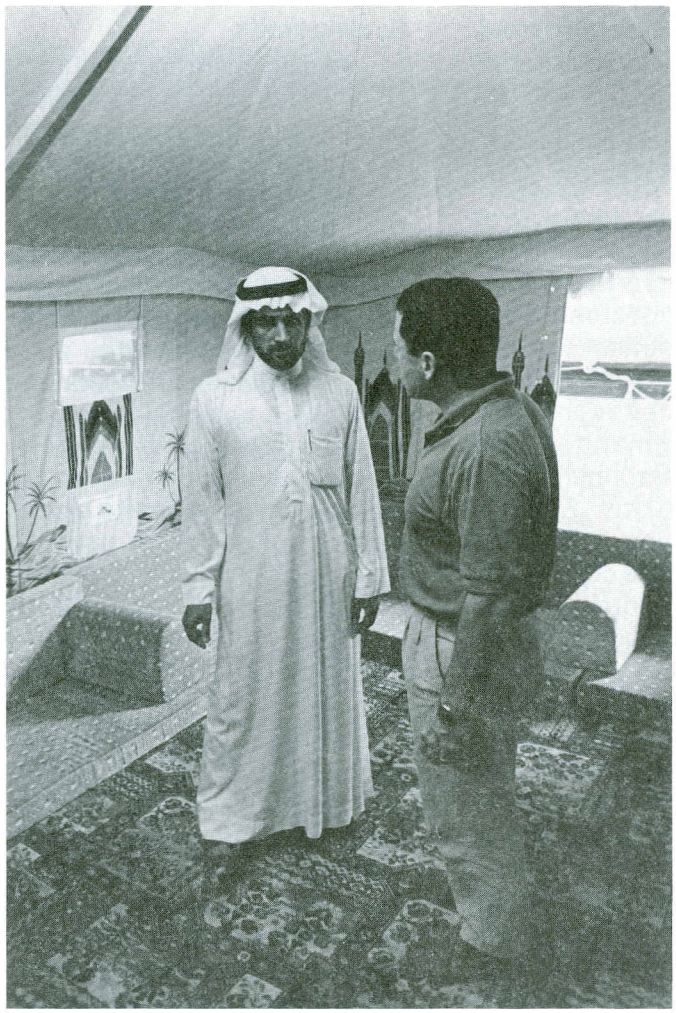
Properly used, contingency contracting is an effective force multiplier of combat service support (CSS) for deployed forces. Contingency contracting can bridge gaps that may occur before the mobilization of the logistical civil augmentation program (LOGCAP) resources, or if a deployment is too small or too short to use the LOGCAP. Contingency contracting is valuable where no HNS (nation to nation) agreements exist in the deployment area. It can reduce dependence on the continental United States (CONUS)-based logistics system. Contingency contracting also can augment existing logistics support capabilities, providing a new source for critically required supplies and services. Meeting demands for supplies and services by contracting for locally available resources both improves response time and frees airlift and sealift for other priority needs.

The U.S. Army Quartermaster Center and School is cooperating with the U.S. Army Contracting Support Agency (an office of the Assistant Secretary of the Army for Research, Development, and Acquisition), and the U.S. Army Combined Arms Support Command (CASCOM) to develop an operational concept for contingency contracting. The concept seeks to institutionalize planning and use of contingency contracting. It outlines responsibilities for commands and agencies that support contingency deployments. The planning systems will ensure considering all potential support resources for deployments: the normal Army supply system, LOGCAP, HNS and contingency contracting.

The contingency concept

builds on an existing contracting branch in the corps support command (COSCOM) Materiel Management Center (MMC) and introduces a similar, slightly smaller element in the division support command (DISCOM) MMC. As outlined in the concept, the corps contracting element will be directed by a lieutenant colonel and will consist of three officers and three enlisted personnel. The division contracting element will be directed by a major and will consist of two officers and two enlisted personnel. Officer personnel assigned to these offices will normally be trained contracting officers.

As a logistician, it is important for you to remember that contracting is only one part of the system to provide supplies and services to U.S. forces in an area of operations. All requests for supplies or services are processed in the same manner, with the G4/S4 controlling whether the supply or service comes from the military supply system by HNS, by LOGCAP or by contract.



LTC Doug Byther, Quartermaster, purchased tents from Saudi Arabian vendors through contingency contracting during Operation Desert Shield/Storm. (Chief of the XVIII Airborne Corps Acquisition Office, Fort Bragg, NC, he wrote an article for the Winter 1990 edition of the *Quartermaster Professional Bulletin* after 60 days of contingency contracting as a deputy contracting officer in the desert.)

Planning for the Unplanned

Unplanned deployments still require planning for their support. All levels must plan to perfect the mechanisms and organization required to provide support with a minimum of lost time or effort. One important aspect of this contingency contracting concept is the development of a planning mechanism. This mechanism is the Contingency Contracting Support Plan (CCSP).

The CCSP begins at the major Army command (MACOM) and is incorporated in subordinate levels of command. The CCSP ensures that contingency contracting plans and procedures are implemented, reviewed and carried out. It further ensures that contracting receives proper weight in logistic planning for contingency deployments. Each MACOM ensures that senior subordinate units have a CCSP to cover probable emergencies and deployments of the unit or units supported.

Units with requirements that may be met by contingency contracting must be aware of the plan and help the supporting contracting element develop procedures and plans to cover various contingencies. Supported activities, units and functions receive copies of approved CCSPs.

Units with contracting personnel establish and maintain Contingency Contracting Support Kits. A separate kit is prepared for each location covered in operational plans. In developing these kits, contracting personnel must use all available data about local resources. This data includes area studies, locally developed logistical support data bases, recommendations from the State Department's foreign service personnel, and information from U.S. or other civilians familiar with the area. A thorough knowledge of existing LOGCAP and HNS agreements, if any, available in the area of operation is also necessary. Contracting personnel must continually update this information. The assistance of supporting finance and civil affairs units should also be obtained. The kit

also contains a full set of forms, supplies and "nice-to-have items" for the contracting office to use when deployed.

The Ordering Officer

You will most likely first encounter the world of contracting as an ordering officer (OO). As a logistics officer, your chances of appointment as an OO during a deployment are high. You would be nominated as an OO by your unit commander and appointed by personnel authorized in the Army Federal Acquisition Regulations Supplement (AFARS) - that is, the contracting officer from the contracting element at your higher headquarters. You would receive instructions and guidance from the contracting officer, but you would not be assigned or attached to the contracting element. Here are some important points to remember about OOs:

- Although generally only commissioned officers are selected, OOs may also be warrant officers or noncommissioned officers.
- OOs must stay within strict monetary and procedural guidelines set forth by the contracting officer. The OO maintains contact with both the contracting officer and the supporting G4/S4 to ensure the existing logistics system is not being bypassed.
- OO may make purchases using Imprest funds (cash fund established by the finance officer for use by OOs to make small purchases).
- OO may make over-the-counter purchases not exceeding a predetermined amount using a Standard Form (SF) 44 (Purchase Order Invoice Voucher), or other designated form or method of record keeping. The contracting officer will keep you informed about funding limits.
- Assignment and location of OOs varies with geographical, political or military requirements. Additional OOs and contracting officer representatives may be required at special locations which produce more than average numbers of contracts or require more than average control. An example may be a port of entry. Also, if a theater of operations overlaps a national boundary, separate OOs or contracting officers may be needed to conduct business under separate laws or customs of each host nation. In the case of a single division straddling a national boundary, for example, additional contracting personnel from corps or the MACOM may be attached.

Alternatively, you may be appointed a contracting officer's representative (COR). CORs are generally subject matter experts (SMEs) or specialists in some specific area. CORs are appointed in the same manner as an OO but do not have the authority to commit the U.S. to the payment of funds. As a COR, you would advise the contracting officer or an OO of details about items or services purchased. You also would monitor contractor compliance and assist in administration of a particular contract. As a COR, you would play a key role in the government's quality assurance responsibility. You would typically monitor the progress of contracts, and inspect and accept the supplies or services delivered to ensure timeliness, quality, quantity and conformance to specifications.

Properly used, contingency contracting is an effective force multiplier of combat service support for deployed forces.

The Contracting Officer

While you can expect to be an OO or COR, you will not be a contracting officer without receiving more training. The legal needs of contracting for the Army in the field require fully qualified personnel in these positions. Your work as OO or COR can serve as an introduction to this area.

As the Army's budget becomes increasingly smaller, and the world becomes increasingly economically and industrially developed, contracting will become more important during support of contingency deployments. As a logistician, you can expect to become an OO or COR during any deployment. To become more qualified to perform these tasks, you can look forward to more training in contingency contracting from the U.S. Army Quartermaster Center and School. Expanded programs of instruction on the role of the OO and COR are being developed for presentation to Officer Basic, Warrant Officer and Officer Advanced Courses, as well as in exportable training for non-Quartermaster officers.

Conrad I. Brown is a Military Analyst with the Concepts and Studies Division, Directorate of Combat Developments, U.S. Army Quartermaster Center and School, Fort Lee, Virginia. He is a former Quartermaster Officer with more than 25 years of Army service in Active and Reserve units. He is a graduate of Command and General Staff College, Fort Leavenworth, Kansas.

A NEW TOOL FOR THE LOGISTICS PLANNER

MAJ Sarah Satterfield *James S. Emery*

Logistics Preparation of the Battlefield (LPB) is a relatively new term used more and more frequently in logistics circles. At this point, LPB has neither been clearly defined nor had its use by the logistician formalized or explained. LPB can be compared to, but should not be confused with, Intelligence Preparation of the Battlefield (IPB) which is covered in some detail in FM 34-130 (Intelligence Preparation of the Battlefield). In fact, some of the products generated under IPB will become a part of a data file of logistics-essential elements of information (LOGEEI) used to develop a plan for LPB. More on this later.

Logistics intelligence is a term that logisticians do not routinely use, so perhaps a definition is in order. FM 7-98 (Operations in a Low-Intensity Conflict) defines logistics intelligence as the operational and tactical information required by the logistician to develop and execute the logistic support plan. The final draft of the Joint Chiefs of Staff (JCS) Publication 3-07 (Doctrine for Joint Operations in Low Intensity Conflict, January 1990), indicates that logistics intelligence is critical to the low-intensity planning effort. JCS Publication 3-07 goes on to provide a list of the minimum areas to include in any logistics intelligence analysis. Some of these areas follow:

- Intent to engage in combined operations and the extent of logistics support to non-Department of Defense agencies and allies.
- Available resources in the area of operations.
- Conditions that alter consumption factors, such as severe climate changes or a requirement to support allies.
- Capabilities of local facilities to support reception and sustainment operations.
- Foreign military logistics structure, national infrastructure capabilities and political tendency to U.S. support forces.
- Environmental, geographical, climatological and topographical factors that may affect logistics operations.
- Analysis of the capabilities of the host nation's and region's lines of communication (LOCs) and capabilities to support the operation.

While JCS Publication 3-07 indicates that logistics intelligence is critical for low-intensity conflict (LIC) operations, it is equally critical to mid-intensity conflicts and high-intensity conflicts. That is enough for now on logistics intelligence. The key point to remember is that a logistician must have a complete logistics data base or file, in order to develop a solid plan for the LPB.

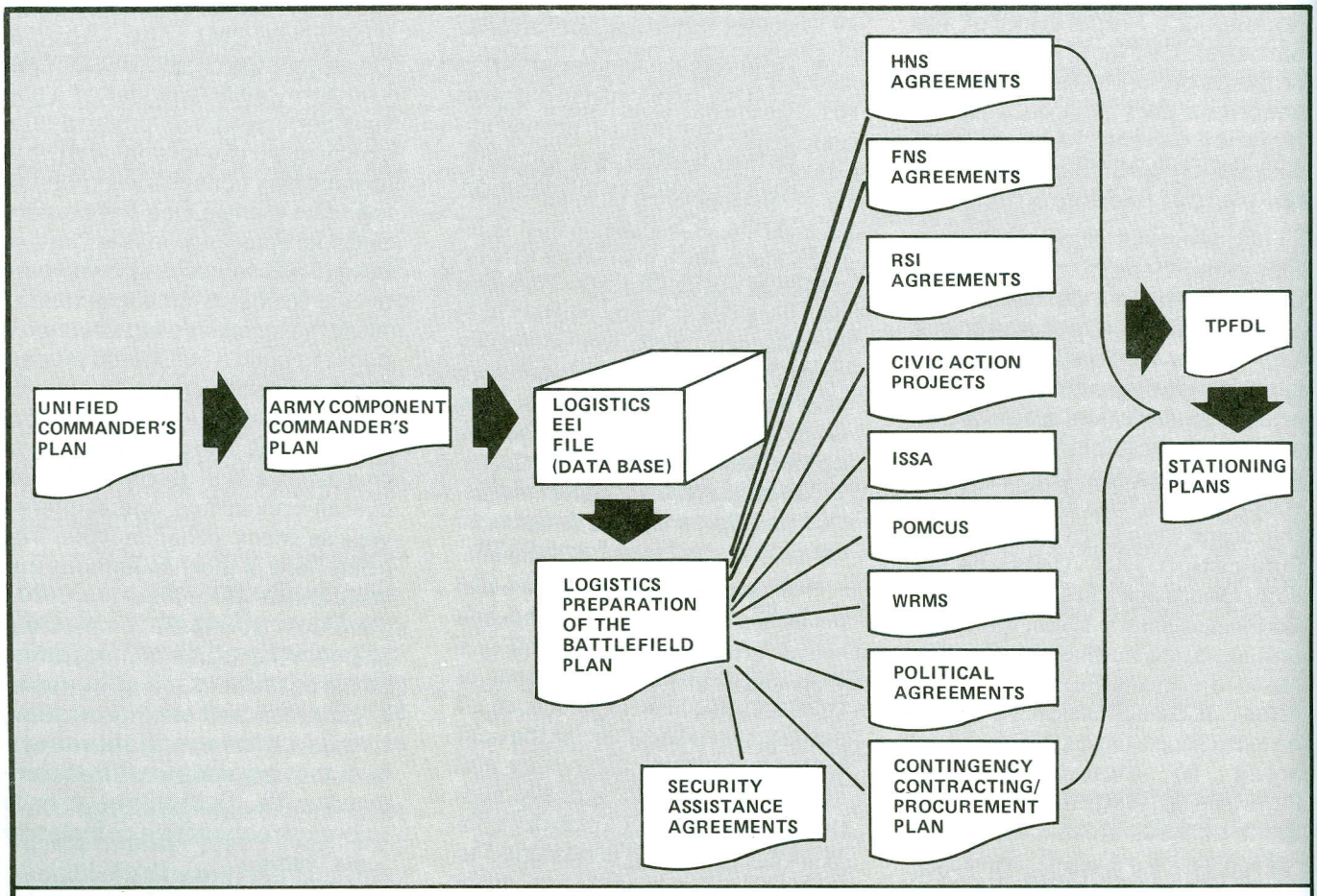
A doctrinal definition of LPB probably does not exist, so one will be proposed here and will become the basis for the rest of this article. LPB is the sum of actions taken to minimize the cost (force structure, resources and strategic lift) of logistically supporting an operations plan or a contingency plan. LPB is designed to lessen or eliminate potential problems during deployment, at the outbreak of hostilities and throughout the campaign. It is a systematic tool used by logisticians and commanders to accomplish their mission. In other words, LPB becomes the framework for the logistician and commander determining where, when and how to deploy their limited resources - supplies, equipment and personnel.

A New Tool for the Logistics Planner

Planning for contingency operations requiring Army forces is the responsibility of the unified commanders such as the United States Pacific Command (USPACOM), European Command (USEUCOM), Southern Command (USSOUTHCOM), Central Command (USCENTCOM) and Special Operations Command (USSOCOM). The Army's commander of a unified command will prepare supporting Army plans with his logisticians concentrating on the logistics plans. Once the country or geographic region is known, or even if U.S. forces only anticipate being focused on a particular area, the logistics planners should begin to build a LOGEEI data base. Once completed, this file can be used to develop a comprehensive plan for LPB. The priority given to this effort will depend on the overall concept of operations as well as many other factors. The point here is that, as logisticians, we cannot afford to wait until maneuver troops are "on the way" to begin the logistics preparation of the battlefield. It is an extremely complex and time-consuming function. If we anticipate correctly, at the national and unified command levels, we should never have to bring troops into a completely "cold" base.

Since this concept is relatively new, some time should be devoted to the process of LOGEEI development (Figure 1). Some suggested major categories of a LOGEEI file will be discussed briefly. Keep in mind that when we plan to use host nation or foreign nation support, one of our objectives has always been to not disrupt internal support of the host nation.

- **Geography:** Collect information on climate and terrain of the area of operations. Use this information to determine the types of equipment needed and when. Water information can assist in determining the need for early deployment of such assets as well digging, water production and distribution units.
- **Supply:** Collect information on supply items that are readily available in the area of operations and that can be used to support our forces. Subsistence items, bulk petroleum and construction supplies are the most common. Collect information on the supply system of the armed forces of the supported country. Is it compatible with ours? Are major equipment items compatible? Has the host nation bought, through foreign military sales, repair parts supporting current U.S systems? Based on these answers, are host nation support (HNS) negotiations feasible?
- **Facilities:** Collect information on warehousing, maintenance shops, production and manufacturing plants, reservoirs, administrative facilities, sanitation capabilities and other facilities. Examine the prisons and



LEGEND:

FNS - Foreign Nation Support
HNS - Host Nation Support
ISSA - Interservice Support Agreement
POMCUS - Prepositioning of Materiel Configured to Unit Sets
RSI - Rationalization/Standardization/Interoperability
TPFDL - Time-Phased Force Deployment List
WRMS - War Reserve Materiel Stocks

Figure 1. Logistics Preparation of the Battlefield Planning Cycle

jails for possible internment of enemy prisoners of war (EPWs). Internment of EPWs, with its implied support responsibilities, was one of our largest logistical problems during the ground phase of Operation Desert Storm in Saudi Arabia. In other conflicts, refugees have created similar logistics problems.

- **Transportation:** Collect information on road nets, truck availability, rail nets, bridges, ports, cargo handlers (longshoremen), petroleum pipelines and material handling equipment. Collect information on traffic flow, choke points and control problems.
- **Maintenance:** Collect information on maintenance facilities that could support our equipment. Examine the supported country's armed force. Can they be used to supplement our capability? Are there common equipment and repair parts? Does the country have adequate machine works for making repair parts?
- **General Skills:** Collect information on the general population of the supported country. Is English commonly spoken? Are there personnel available for interpreter/translator duties? Will a general labor pool be available? What skills are available that we can use. (For instance, drivers, clerical, material handling equipment (MHE) operators, food service, guards and mechanics.
- **Miscellaneous:** Include any other information that could prove useful. Establish other categories as necessary.

Collecting logistics intelligence information is not as difficult as it first may appear. Much information is routinely collected, and several agencies can assist the logistician as building a LOGEEI file. The State Department with embassies worldwide is an excellent source of detailed information on a particular country. Embassy staffs routinely do studies that, when current, provide the bulk of your information. A good college library is another excellent source of information. The weather and terrain data bases in the IPB with its overlays can provide excellent, current information for preselecting LOCs and sites for logistics facilities. The IPB Event Analysis Matrix and Template in the IPB (FM 34-130) can also help determine the need for route improvements and bridge reinforcements. If U.S. Army Civil Affairs or Civil-Military Operations units are either in country or targeted on a specific country, a wealth of logistics intelligence information will be available. These units have functional specialists who focus on particular areas, such as civilian supply, public health, public safety and transportation. These personnel can conduct specific country studies and can also provide outstanding support when the logistician begins to develop the plan for LPB.

Let us now assume that we have focused on a specific country and developed a comprehensive LOGEEI data file. How can we use this information to assist us in the LPB? We will use a few examples to demonstrate its utility.

If we are concerned with petroleum support, we could review the supply portion of our LOGEEI data file to determine what is already available. If large quantities of petroleum, oils and lubricants (POL) are available, we will not need to direct scarce airlift to transport fuel. When Operation Urgent Fury was initiated in Grenada, we used some of our early air frames to move bulk POL, only to find that a U.S. firm owned a large tank farm on Grenada which we could have used.

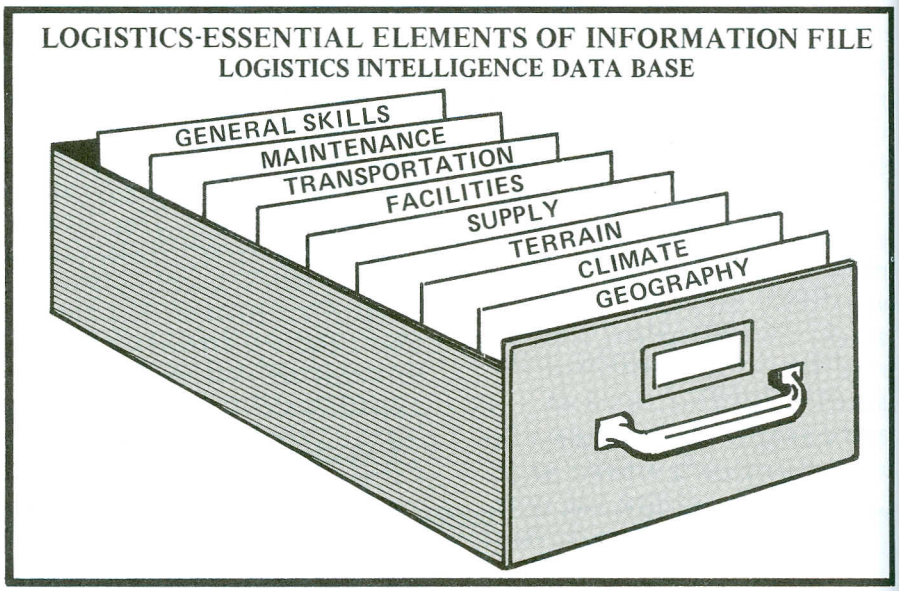
If we anticipate correctly at the national and unified command levels, we should never have to bring troops into a completely 'cold' base.

A review of the climate and terrain portion of our LOGEEI data file may indicate that potable water is a problem. This type of information could indicate a need for early deployment of engineer well-drilling teams, water purification equipment or water trucks. Conversely, we might choose to negotiate HNS to provide supply and distribution of water, as we did in Operation Desert Shield/Storm, so we can use the early air frames for other urgent requirements. HNS is an extremely important part of LPB, but since volumes have been written on this subject it will be treated lightly here. Suffice it to say that it takes time to develop good HNS agreements and that there is a fairly strict regimen to follow to formalize such agreements. The fact that most unified commands have special offices dedicated to HNS is an indication of its value.

Now, let us assume that we target a rather undeveloped country with an extremely poor

road network. A review of the proposed concept of operation reveals the need for a lengthy north-south main supply route (MSR) but neither a road nor a rail network is available. Only a dirt road, frequently impassable even to carts pulled by animals, is available. The dirt road is crossed frequently by two streams with primitive bridging. We may want to build into our LPB plan a humanitarian/civic assistance program to assist the host nation in building a road with bridges for heavy host nation traffic. Such projects must directly support a U.S. forces training need that cannot be met elsewhere at less cost. Operation Blazing Trails provides an excellent example of how this concept was used in South and Central America. U.S. Army Engineers, including several units from the Reserve Components working alongside host nation engineers during a training exercise, successfully constructed a road network that expanded the local economy, yet could be used as LOCs if military action developed.

Other assets or tools you may want to consider as you develop your LPB plan are prepositioning of materiel configured to unit sets (POMCUS), war reserve materiel stocks (WRMS), use of containerization to limit handling, HNS agreements, and interservice support agreements, among others. Any actions you can identify to reduce the cost of moving supplies, equipment and personnel into a target zone are candidates for your LPB program. Planning must provide for the timely arrival of combat service support (CSS) assets that are balanced according to the mission. Rapid deployment assets are extremely limited. We cannot afford to squander even one sortie on movement of unnecessary supplies, equipment or personnel. A well-thought-out LPB program, along with the time required for proper execution, will go a long way to help avoid this. Do not underestimate the time and resources required to accomplish many of these actions.



This article is not intended to cover all aspects of logistics intelligence and logistics preparation of the battlefield, but it is designed to project an idea which may prove useful in future logistics planning. It may also indicate a need for the development of doctrinal guidance on LPB similar to what the Military Intelligence Corps has done with its excellent field manual, FM 34-130. If you are interested in additional information in this area, you may want to refer to the JCS International Handbook for Logistic Systems Development which provides a comprehensive guide for establishing logistics support in an underdeveloped nation.

MAJ Sarah Satterfield, is Chief, Organization and Personnel Services Division, Directorate of Combat Developments, U.S. Army Quartermaster Center and School, Fort Lee, Virginia. Her previous assignments include Training Officer in a Women's Army Corps (WAC) basic training company; Company Commander with the 172d Infantry Brigade, Fort Richardson, Alaska; Executive Officer, Deputy Chief of Staff for Logistics, First Army, Fort George G. Meade, Maryland; S4, Provisional Support Battalion, Cuban Refugee Task Force, Fort Indiantown Gap, Pennsylvania; and Deputy G4, 3d Armored Division, Frankfurt, Germany. She is a graduate of Methodist College, Fayetteville, North Carolina; the WAC Officer Basic, Supply Management, Northern Warfare Training and Quartermaster Officer Advanced Courses; and Combined Arms and Service Staff School.

James S. Emery is a Military Analyst with the Concepts and Studies Division, Directorate of Combat Developments, U.S. Army Quartermaster Center and School, Fort Lee, Virginia. He has served in both joint and combined planning positions and has served on division, Army, and unified command staffs. He is a Distinguished Military Graduate of East Tennessee State University, Johnson City, a graduate of the Logistics Executive Development Course Fort Lee, Virginia, and the Command and General Staff College, Fort Leavenworth, Kansas.

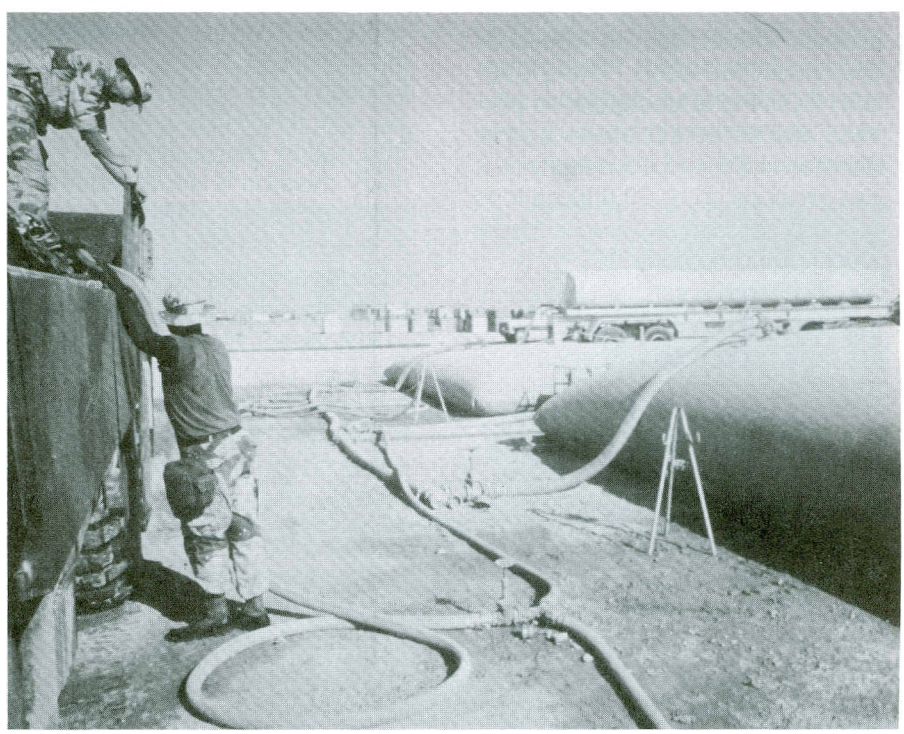
WATER SUPPORT - THE FUTURE BEGINS HERE

CPT Melinda C. Litman

An integral part of our ability to sustain combat operations is the water supply system. Water is a vital commodity, used for a variety of purposes. Soldiers require water for personal hygiene, field feeding, heat casualty treatment, vehicle maintenance, construction, laundry, aircraft maintenance, medical treatment and chemical decontamination. If a soldier does not have adequate water, his health, combat effectiveness and, ultimately, the success of the mission are jeopardized.

Current Doctrine

The current water support doctrine is in FM 10-52 (Water Supply in Theater of Operations), dated 11 July 1990. The updated FM 10-52 describes water supply point equipment and operations at all echelons, under all combat conditions and in all environments. According to current doctrine, water is purified, stored and distributed on an area basis under the control of Quartermaster units. Quartermaster units maintain and operate a potable-only water supply system. Although not all water required in a theater of operations must be potable, a potable-only system minimizes health hazards. All water is issued from water supply points, which can fill water containers ranging from 5-gallon cans to water trailers/ tankers and collapsible fabric drums.These water supply points are established as far forward as possible, considering the location of available water sources and the location of consuming units. The most forward point is normally located in the brigade support area (BSA) when possible. Supported units draw water from supply points using organic transportation. Water support is divided into direct support (DS) and general support (GS) levels. The DS water supply function is performed by divisional and non-divisional supply and service (S&S) companies. Divisional water support is provided by the S&S company of the main support battalion (MSB) or the headquarters and supply company of the supply and transport battalion. Within this unit, the water section can establish and operate water supply points in both the division support area (DSA) and each BSA. However, this method of water resupply is not feasible within the light infantry battalion, light infantry divisions due to the limited number of vehicles. Here water resupply is primarily by unit distribution. Water will be moved forward from the BSA to the battalions using five forward area water point supply systems (FAWPSS) and the unit's organic Reverse Osmosis Water Purification Unit (ROWPU) 5-ton prime mover. In most areas of the world where the Army expects to fight, water sources are readily available and the DS system in the organic water units is adequate. With no water sources or very limited sources in an area of operation, large quantities of water must be transported and stored. For this mission, a GS



Soldiers at a Tactical Water Distribution System (TWDS) during Operation Desert Storm fill a collapsible fabric drum transported in a truck bed. In the background, a commercial 'hardwall' water tanker replaces water in one of the TWDS' 20,000-gallon fabric storage drums.

water system is used. In GS operations, water purification units produce water from any available source. Water supply battalions and subordinate companies along with detachments and teams store and distribute bulk potable water throughout the theater of operations. Engineer units drill and construct wells and provide construction support for water point improvements.

An integral part of our ability to sustain combat operations is the water supply system.

Current Equipment

There are several types of water purification equipment. The 600-gallons per hour (GPH) ROWPU provides water to Army divisions, separate brigades and armored cavalry regiments. It can produce up to 12,000-gallons per day from a fresh water source or 8,000-gallons per day from a salt water source (based on 20 hours of operation per day). The 3,000-GPH ROWPU is designed to provide water at echelons above division in DS and GS missions. It can produce up to 60,000-gallons per day of water from a fresh water source or 40,000-gallons per day from a salt water source (again based on 20 hours of operation per day). The primary equipment being used by GS units is the 3,000-GPH ROWPU and a commercial 150,000-gallons per day ROWPU, which is presently deployed to Operation Desert Shield/Storm. Water storage equipment consists of a variety of collapsible fabric tanks. Either the newer 3,000-gallon "onion" tanks or stave tanks accompany the 600-GPH and 3,000-GPH ROWPU . Larger pillow tanks, with capacities of 20,000 and 50,000 gallons, are used to build systems capable of storing up to 1 million gallons. Divisions are augmented in a desert environment with sufficient 20,000-gallon tanks to provide 40,000 gallons of storage in each assigned brigade and 300,000 gallons in its division support area. Water supply companies build bulk storage terminals with the 50,000-gallon tanks

Water distribution is accomplished by several methods. The Tactical Water Distribution System (TWDS) is a general support piece of equipment. Its 6-inch hoseline is used to transport bulk supplies of water to major users and between bulk storage sites. The Semitrailer-Mounted Fabric Tank (SMFT) is used to convert flatbed semitrailers to water transporters. The Forward Area Water Point Supply System (FAWPSS) consist of six 500-gallon fabric drums. Its primary mission is aerial redelivery, however, it can be transported by a variety of cargo vehicles, or helicopters. The 400-gallon water trailer is used to transport and store water in nearly all units, except those without prime movers. For units without a prime mover, water is transported and stored in 55- and 250-gallon fabric drums.

Desert Shield/Storm

The water consumption planning factors used for soldiers deployed to Operation Desert Shield/Storm averaged 20 gallons/soldier/day for total water needs. Because of the hot, dry nature of the desert, soldiers drank approximately 3 gallons/soldier/day to prevent heat injuries and maintain effectiveness. Extensive host nation support (HNS) augmented our water system. However, even with this support, the water supply system still has been a concern. One problem is location of all GS water support assets in the Reserve Component. Because of the time required for mobilization and priorities for troop movement, water supply units were not in theater soon enough to provide responsive water support. While HNS assisted in meeting the requirements for Operation Desert Shield/Storm, HNS may not always be available in some contingency operations. One solution to the Reserve Component problem of Operation Desert Shield/Storm is to realign the force structure and place a portion of GS water supply units in the Active Component. This would make water units available for immediate deployment with the contingency corps and ensure conti- nuous support. Another problem is inadequate water distribution capabilities within the theater because of no dedicated water hauler suitable for delivery of water to the BSA. The SMFT was designed for the line haul of large quantities of water, rather than multiple deliveries at a series of sites. In Operation Desert Shield/Storm, 5,000-gallon "hardwalled" tankers delivered water down to the unit level. However, requiring these thin-skinned vehicles to perform so close to the front, over the long term, is in serious question.

AirLand Operations Concept

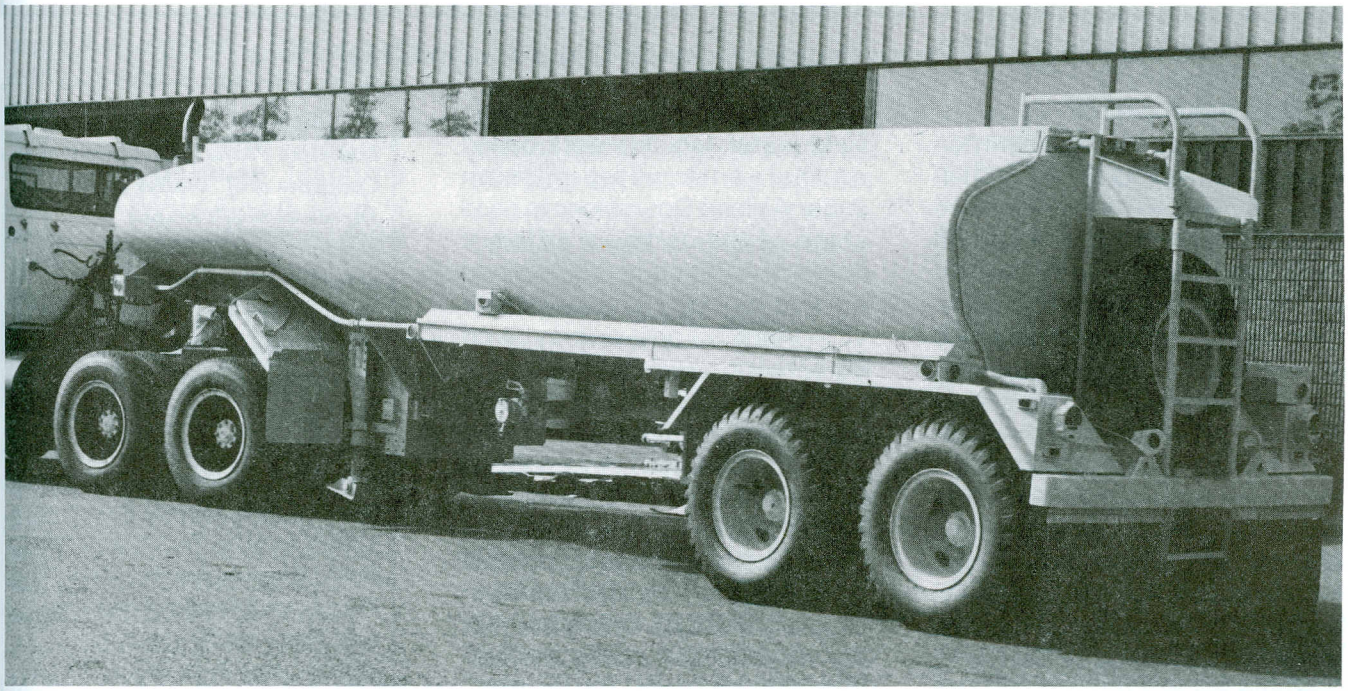
The current water system supported our requirements for Operation Desert Shield/Storm, but there is a need for refinements in light of the increased mobility and agility of units in the AirLand Operations concept.

AirLand Operations envisions a nonlinear battlefield. To adapt to this shorter, faster-paced battle of the future, divisional structures were "unweighted." Maneuver battalions were unweighted by moving the support platoon, with its ability to pick up and distribute water, to the forward support battalion (FSB). Therefore, water production and distribution to the unit level will depend primarily on corps. Responsibilities for water support operations will now shift within Quartermaster units (Figure 1). Under AirLand Operations, water operations will continue to be separated into DS and GS/arid operations. Within maneuver brigades, water will be distributed to the company combat trains. The field service company (FSC) will absorb all water assets from the MSB and will provide water support to both divisional and nondivisional units in a theater of operations. The FSC will also purify and store water for units located in the corps area on an area basis. Corps units will get their water from the closest water transfer point. The GS water supply company created for arid operations will be organic to the contingency corps. It will produce, store, transport and distribute water for corps and divisional units. The medium truck company will continue to have the mission of bulk water line haul.

Future Developments

The real problem we are facing in the AirLand Operations concept is how to deliver water from the BSA to the unit. We have expanded our scope to look at water support in a variety of ways. We are researching a system for packaging water, which would result in easier handling and delivery. The package could be a low-cost mix of different sizes. If water were handled as a packaged product for distribution purposes, large package quantities, like any other standard supply package, could be placed on a palletized loading system platform and moved forward to be placed on the ground. If the unit moved, the package would simply be left, and arrangements would be made to receive more water at the new location. Water distribution that mirrors the bulk Class III (petroleum, oils and lubricants) distribution system is also being studied. Here, a modified Heavy Expanded Mobility Tactical Truck (HEMTT) would make unit deliveries. Both systems have advantages. Further study will determine what is the best solution to support AirLand Operations.

The U.S. Army Quartermaster Center and School recently hosted a water "workshop" to help determine the best method of providing improved water support to the theater of operations. Representatives from all Army service schools were invited, and a vast majority attended. Discussions focused on the large volumes of water that combat and combat service support activities use. For example, medical treatment facilities consume



Operation Desert Storm highlighted the Army's need for a 'hardwall' water tanker.

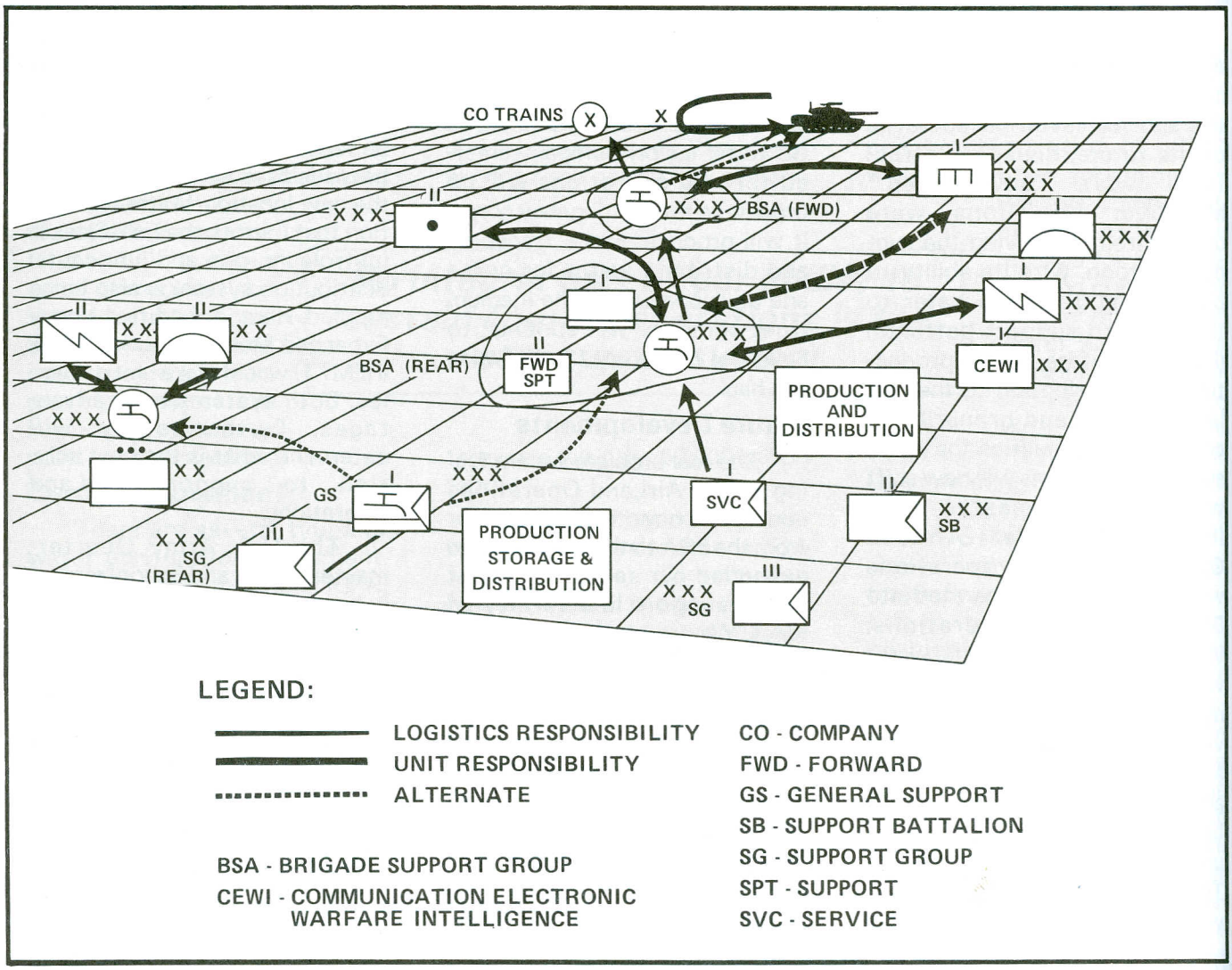


Figure 1. Water Support Concept Under AirLand Operations

25,000-50,000 gallons per day of potable water, and ammunition supply points require 3,000 gallons per day of water. Service school representatives agreed their units required some amount of residual water storage capacity. Quartermaster units would deliver water to the company combat trains or possibly the weapons system and replenish unit residual water storage. Receiving units would distribute from the point of bulk delivery to the individual soldier and continue to replenish the soldier's needs from unit residual storage until the next bulk delivery. Service school representatives were asked to determine battlefield water requirements based on their anticipated mission under Airland Operations in each stage of the battle, in different levels of conflict, in arid/nonarid environ-ments, and also to provide input on any size/type of equipment needed for storage and distribution. These requirements will be analyzed as the basis for continued development of the Quarter- master operational water concept. As the Quartermaster Corps continues to make great strides in water support, we must remember that our most prized asset, the soldier, runs on water.

CPT Melinda C. Litman is the Logistics Plans Project Officer, Concepts and Studies Division, Directorate of Combat Developments, U.S. Army Quartermaster Center and School, Fort Lee, Virginia. She is a graduate of Lander College, Greenwood, South Carolina, and the Quartermaster Officer Basic and Quartermaster Officer Advanced Courses. In previous assignments, she has served as CEB (Clothing Exchange and Bath) Platoon Leader, 593d Supply and Service Company, and Force Modernization Officer, 29th Area Support Group in Germany.

MAP SUPPLY FOR THE ARMY IN THE FIELD

Conrad I. Brown

Many soldiers have a story or two about the problems of reading a map or getting lost with a map in hand. As a Quartermaster officer or enlisted soldier you may soon have another consideration when thinking about maps. In addition to the universal requirement to know how to read a map, you may be the point of supply for maps. An emerging U.S. Army Quartermaster Center and School (USAQMC&S) concept provides for supply of standard mapping, charting and geodesy (MC&G) products within the Army supply system.

First, some definitions. Most supply personnel are probably not familiar with the terms "mapping, charting and geodesy products" and "standard maps and map products. " These terms are broadly the same.They refer to the many familiar types of printed or photographic maps but also include other items, such as gazetteers, aero-navigation maps, hydrographic charts and many others. A standard MC&G product can be defined as any item available by catalog number from the Defense Mapping Agency (DMA) catalog. DMA is also developing electronic media for storing and transmitting maps. Maps may soon be routinely available on compact disks and magnetic tape, as well as the familiar paper varieties. All of these items are standard products. Remember, no matter how esoteric the item seems, if the item has a catalog number and you can find it in the DMA catalog, it is a standard product. The supply system will provide it.

Nonstandard, or special MC&G products, on the other hand, are most often produced in the field by Engineer topographic units or modified by the Engineers from standard products in a variety of ways, such as overprinting. The requesting command normally picks up nonstandard products from the Engineers, so nonstandard products do not normally enter the supply system.

Some brief comments about map supply in support of Operation Desert Shield/Storm might be of interest. At a meeting held in mid-December of 1990, DMA reported shipping about 38 million maps to Saudi Arabia by the end of November. As a logistician, you should note that the 38 million maps weighed more than 3 million pounds and used approximately 1,900 pallets, requiring more than 86 semitrailers or Seavans to move. By comparison, 38 million maps is about the same number of maps held in all United States Army, Europe (USAREUR) stocks.

In the past, map supply was hampered by contradictory doctrine, wide local variations in requisition and stockage procedures, and poor access to the logistics and transportation network. Because it was an Engineer function, map supply existed outside the logistics system. For this reason, maps often received an undeservedly low priority for transportation. The integration of maps into the Army supply system, including requisition and distribution, is expected to improve map distribution. Existing direct support (DS) procedure does not change. Both divisional and nondivisional customers will order maps through respective DS channels using standard Army supply system procedures. This may not have been the case at some locations or in some units, as noted. However, as maps are integrated into the supply system, you should expect customers to follow normal DS procedures for map requisitions.

The major change in the system will take place at the general support (GS) level. In the past, Engineer units were the GS-level supply source for maps. Under the new concept, Quartermaster Corps proponent units will assume this responsibility. To perform GS map storage and supply functions, the USAQMC&S is developing a map supply organization (probably a detachment). Detachments may be assigned to selected Quartermaster supply companies (GS) (TOE 42418L000). These detachments are allocated at a minimum, based on one for each supported corps support command (COSCOM) or Theater Army Area Command (TAACOM). While not completely developed at this time, the map detachment will most likely consist of a platoon leader, specialty code (SC) 92B (Supply and Materiel Management), and about 20 to 22 MOS 76P (Materiel Control and Accounting Specialist) and 76V (Materiel Storage and Handling Specialist) soldiers.

Adding this detachment to existing GS companies will provide what is necessary to meet surges in requirements. Map storage sites will be collocated with supply points for other classes of supply operated by the general supply company. This mission will not call for an additional MOS. Existing MOS 76P and 76V soldiers will operate the map supply points with a minimum of

...the Army cannot adequately perform its training and missions without a dependable supply of maps.

additional training at the USAQMC&S. The training will aim at making Quartermaster soldiers familiar with the DMA catalogs and products, as well as the new terms.

As maps come into the supply system, stock and issue will follow the provisions of AR 710-2 (Supply Policy Below the Wholesale Level) for entry of map requisitions in the Military Standard Requisitioning and Issue Procedures (MILSTRIP) format. Transactions will be processed through existing or planned automated data processing systems using specified document identifier codes, with DMA map catalog numbers used like manufacturer part numbers. Maps will be included in stockage lists at GS Class II (general supplies), IV (construction and barrier materiel), and VII (major end items) supply points in TAACOM and corps.

You, as the supplier of maps, will not be required to develop demand data for maps. The unit S2/3 or G2/3 will generate map requirements. The requesting unit S2/G2 normally verifies map requisitions before submission by the S4/G4 to the Materiel Management Center (MMC). Individual major Army commands (MACOMS) or theater commanders will continue to follow the provisions of Army Regulation (AR) 115-11 (Army Topography) for requirements planning. Most MACOMS will publish a supplement to this regulation, providing details for specific requirements of the command.

MMCs at each COSCOM and TAACOM will treat MC&G products the same as other controlled supply items. They will maintain stock status, coordinate intratheater transportation of MC&G products with appropriate agencies, release stocks in response to valid requisitions and reorder bulk stock from DMA for shipment to storage sites. As with other general supplies, maps may be transported to DS units, or throughput as far forward as possible, depending on the tactical situation and availability of transportation assets. COSCOM/TAACOM MMCs will submit periodic reports of map receipts, issues and quantities on hand to the Theater Army Materiel Management Center (TAMMC).

At the highest level, the TAMMC acts as theater item manager for MC&G products. The TAMMC coordinates and plans map supply, asset visibility for in-theater MC&G products, access to the theater transportation system and stock control. Maps, although expendable upon issue, will normally be an intensively managed item at each MMC. DMA remains the source of supply, providing MC&G products in bulk as the wholesaler. Integration of MC&G products into the standard Army supply system will provide inventory control, visibility and adequate access to the Army's transportation system. This will improve the distribution of MC&G products, while providing new opportunities for Quartermaster-trained officers and enlisted soldiers.

DMA, as a Department of Defense agency, will be the supplier of maps to the Army, as it is to all the armed services and other government organizations and agencies. In a related and parallel initiative, DMA is working with Army cataloging and automation agencies to allow maps to be recognized by the automated system. The U.S. Army Corps of Engineers remains the proponent for Army topography. Engineer topographic battalions will continue their traditional role in the production of special maps and terrain-related products and services in the field. Engineers will also retain the ability to produce limited quantities of standard maps in theater, if required. Requests for special maps and terrain-related products will be routed through Engineer channels.

As much as it needs food, fuel and ammunition, the Army cannot adequately perform its training and missions without a dependable supply of maps. As the Quartermaster Corps adds this new and important "product" to its "line" of goods and services, USAQMC&S-trained personnel can expect to be challenged by this different item of supply.

Conrad I. Brown is a Military Analyst with the Concepts and Studies Division, Directorate of Combat Developments, U.S. Army Quartermaster Center and School, Fort Lee, Virginia. He is a former Quartermaster Officer with more than 25 years of Army service in Active and Reserve units. He is a graduate of Command and General Staff College, Fort Leavenworth, Kansas.

COMPLETE WATER SUPPORT FOR THE FORCE

CPT Brett D. Weigle

The requirement to provide potable water on a large scale to soldiers in an arid environment arose in the late 1970s with the formation of the Rapid Deployment Force (RDF). With the requirement to be able to rapidly project power into the Middle East, the RDF and its associated logistical support received considerable attention. Water support in that area is even more critical because the Joint Chiefs of Staff mandated that the Army provide backup general support to the other services when they exceed their organic water purification capability. Since then the Army has made tremendous progress in water support.

Water supply doctrine for a theater of operations was written. Equipment for the production, storage and transportation of potable water from previously unusable sources was procured. Water purification and supply units were activated in the U.S. Army Reserve (USAR) and Army National Guard, with their equipment placed into contingency operating stocks at Pueblo Army Depot in Colorado. Supply and service companies in the support battalions of several continental United States (CONUS) divisions received the capability to produce limited amounts of potable water from brackish water or seawater. This capability will eventually include all divisional and corps-level support units. Finally, high-volume water purification equipment capable of purifying 150,000 gallons per day was prepositioned in the Middle East to decrease response time during an operation there.

This doctrine, however, addresses a large-scale crisis, such as Operation Desert Shield. The Army currently suffers a shortfall in providing water support on a global basis during training exercises to Army forces which have not received upgraded equipment. This deficiency severely strains logistical support to these same units and those of the joint-service United States Special Operations Command (USSOCOM) during contingency operations or conflict. We will look at a possible solution.

Before we start, let's define some terms. We will refer to an "exercise " as a planned operation whose primary purpose is training. "Contingency operation" will be defined as one executed on short notice with minimal planning. This operation is carried out by selected forces in support of U.S. foreign policy goals. Contingency operations range from "showing the flag" in an area where American lives or interests are threatened to a hostage rescue action to actual combat. In the more technical arena, potable water is defined as water free from disease-producing organisms, poisonous substances, and nuclear, biological and chemical (NBC) contaminants that make it unfit for human consumption and other uses. Brackish water contains dissolved materials in concentrations from 1,500 to 15,000 milligrams/liter (mg/l) while seawater has over 15,000 mg/l of dissolved materials. The term "saline" includes both of these categories of nonpotable water.

Let's look at fielded and developmental water purification equipment available to the Army today. When the Quartermaster Corps assumed responsibility for this mission from the Corps of Engineers in 1984, supply and service companies inherited the existing Engineer Research and Development Laboratory (ERDLATOR) water purification units. The ERDLATOR comes in two models: 1,500 gallons per hour (GPH) and 3,000 GPH. The ERDLATOR produces potable water in much the same way that a municipal water treatment plant does, through settling and coagulation of impurities and chlorination to eliminate microorganisms.

The ERDLATORs are decades old and repair parts are difficult to obtain. Both models of the ERDLATOR are mounted on a truck chassis and can only be airlifted by C-5 cargo aircraft because of height restrictions. Their biggest shortcomings are that both models neither have the technology to purify saline water nor the ability to operate in an NBC environment.

Enter the Reverse Osmosis Water Purification Unit (ROWPU). It is the only water purification equipment capable of purifying brackish water and

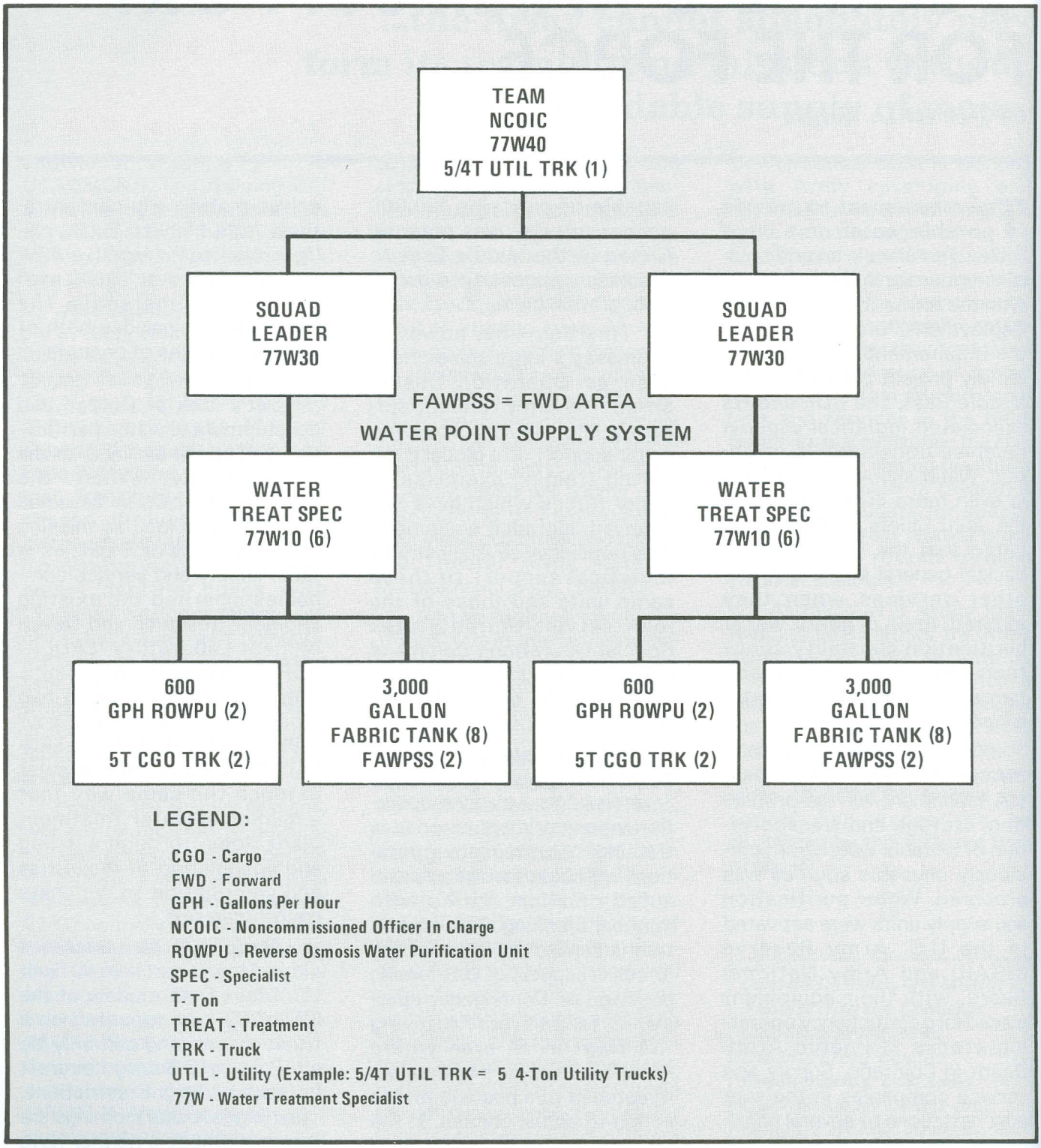
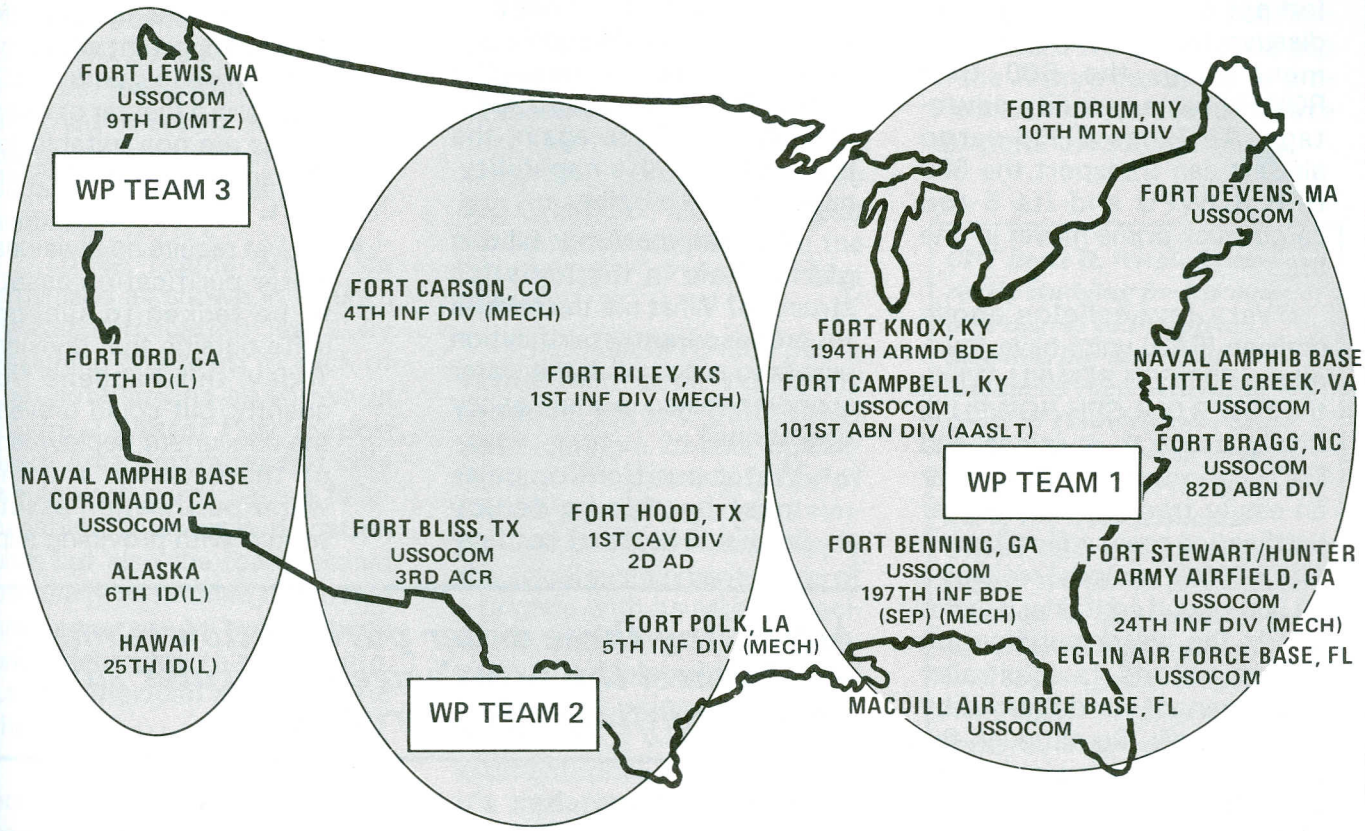


Figure 1. Water Purification Team

seawater. The ROWPU does this by forcing water under pressure through a semipermeable membrane which does not allow the salts and other impurities to pass. It can also remove NBC contaminants from water through a special set of filters. The ROWPU is being fielded in three models: a trailer-mounted version of the 600 GPH capacity, a 3,000 GPH version carried on a flatbed semitrailer, and a 150,000 gallon per day model. The 150,000 gallon per day model has been mounted in pairs with accessory electrical generators on ocean-going



LEGEND:

AASLT - Air Assault
ABN - Airborne
ACR - Armored Cavalry Regiment
AD - Armored Division
AFB - Air Force Base
AMPHIB - Amphibious
ARMD - Armored
BDE - Brigade
CAV - Cavalry
DIV - Division
ID(L) - Infantry Division (Light)
ID(MTZ) - Infantry Division (Motorized)
INF - Infantry
L - Light
MECH - Mechanized
MTN - Mountain
MTZ - Motorized
SEP - Separate
USSOCOM - United States Special Operations Command
WP - Water Purification

Figure 2. Water Purification Team Area Coverage

barges. These ocean-going barges can be towed to a theater of operations and anchored just offshore, where the ROWPUs will pump purified water ashore through a floating hoseline. While the 150,000 gallon per day ROWPU has the disadvantage of a long deployment time, the 600 GPH ROWPU has a mobility advantage. Air Force C-130 cargo aircraft can transport the 600 GPH ROWPU and its 5-ton cargo truck prime mover in one lift.

Very few echelon above division (EAD) units have fielded the 600 GPH ROWPU. When the new 3,000 GPH ROWPU is finally issued to divisional and EAD support units, the need for an easily transportable water purification asset will still exist. The 3,000 GPH model requires a 50,000-pound container handler to lift the water purification unit on and off its semitrailer and it cannot be delivered by C-130 aircraft. So although the ROWPU provides significant advantages in water purification, various problems in deployability will force the Army to adopt a mix of ROWPU models in the force structure. All combat units based in CONUS require augmentation to produce enough potable water to support the sustainment level of 11.1 gallons/soldier/day in an arid environment. The units that have fielded the 600 GPH ROWPU do not have enough ROWPUs to attain this standard. Units still using the ERDLATORs suffer from the deficiencies in that item of water purification equipment.

The supply and service company in a corps support command (COSCOM) currently provides direct support (DS) to divisions to overcome their water purification equipment shortfalls. It also provides general support (GS) to non-divisional units which have no organic water purification assets, such as USSOCOM units. To accomplish these missions, the COSCOM supply and service company uses the 1,500 GPH and 3,000 GPH ERDLATORs. Once again, the ERDLATOR limits capability, reliability and mobility.

How can the Army fill this glaring hole in the logistics structure? What are the criteria for proposed water purification assets to accomplish the water support mission in contingency operations?

- Water purification units must be able to deploy within 18 hours of notification. This matches the response time of the Ranger battalions, airborne and air assault brigades designated as the first units to deploy in a contingency.
- It must have the capability to purify saline water and water contaminated during NBC attack.
- It must be able to produce enough water to support the worst-case scenario of a 5,000-soldier brigade with its "slice" of support elements in an arid environment. Using consumption planning factors developed by the U.S. Army Quartermaster Center and School and the Army Combined Arms Support Command at Fort Lee, VA, this means 55,500 gallons per day at the sustainment level of 11.1 gallons per soldier.
- It must be easily transportable by C-130 aircraft. This is important when the only airstrips under U.S. control in a theater of operations are not suitable for the larger C-141 and C-5 aircraft.
- It must require no divisional water purification assets to be tasked to support units outside that division. Today, this happens frequently, but could prevent the concurrent deployment of the division and the water purification assets tasked with providing support during a crisis.
- It must not require any equipment not already in the military inventory.
- It should be assigned to a corps-level Army unit to provide responsive support over a wide geographic area to either a joint or single-service task force.

Activating three water purification teams would meet the Army's need for water support in contingency operations.

The water purification and water supply units assigned to the USAR lack the capability to properly support this quick-response mission. Their major end items are stored as war reserve stocks. Neither the personnel nor the equipment could be prepared to meet the necessary deployment window. To fill this gap in the Army's water supply structure, I propose to

activate three water purification teams, each with the capacity to purify 2,400 GPH. These teams would be assigned to corps support commands of I Corps at Fort Lewis, WA; III Corps at Fort Hood, TX; and XVIII Airborne Corps at Fort Bragg, NC. Consisting of only 15 soldiers, these teams would be attached to supply and service battalions for administrative, subsistence and maintenance support.

These teams would be organized as shown in Figure 1 (Water Purification Team). By assigning one team to each of the installations as shown in Figure 2 (Water Purification Team Area Coverage), not only would each corps have a fully-capable GS water purification unit, but also the teams would be ideally positioned to provide area coverage to contingency units deploying to the Pacific, Latin American and Atlantic theaters.

The additional soldiers and equipment required to staff and equip these teams could be offset by reallocating positions for 45 soldiers in military occupational specialty (MOS) 77W (Water Treatment Specialist) from those scheduled to redeploy from U.S. Army Europe under the upcoming Conventional Forces in Europe (CFE) treaty reductions. Most of the organizational equipment for the teams, such as vehicles, could be resourced in the same manner. The Department of the Army (DA) could issue twelve 600 GPH ROWPUs from depot stocks out of sequence on the DA Master Priority List (DAMPL).

The 2,400 GPH water purification team could nominally produce 48,000 gallons of water during a 20 hour operating day. The planning factor of 55,500 gallons/day means simply that one team could supply the actual sustainment needs of a brigade with its rated capacity. Consider that in some scenarios the deployed force would already be using its organic ROWPUs and would only need augmentation. In those cases, the planned production figure would be readily achievable. I have presented some challenges facing today's logistics planners in water support of contingency forces. I have also presented a solution that would only require the reallocation of personnel and equipment resources to three new units. The 2,400 GPH water purification teams would close the gap in the Army's capability to provide water to its ultimate weapon - the soldier.

CPT Brett D. Weigle is currently studying for his master's degree in Petroleum Engineering under the Advanced Civil Schooling program at Pennsylvania State University, University Park, Pennsylvania. He is a graduate of the Quartermaster Officer Basic, Quartermaster Officer Advanced and Ranger Courses. He has served as both a petroleum and water platoon leader, support operations officer, and, most recently, as Commander, 110th Quartermaster Company, Hunter Army Airfield, Georgia.

ARMY SPINOFFS CLOTHE CONSUMERS

Research on military clothing at the U.S. Army Troop Support Command's (TROSCOM's) Natick Research, Development and Engineering Center in Natick, MA, often benefits the civilian consumer with technological spinoffs.

Going back a few years, all major raincoat manufacturers continue to use a Quartermaster-developed water repellent process named "Quarpel." Lightweight body armor, an offshoot of an improved system for the combat soldier, is being used by civilian law enforcement agencies. Gore-Tex, a water-resistant material now widely used commercially for outdoor sporting attire, got its application as a fabric from Natick engineers. One of Natick's current projects - liquid-cooled garments to relieve heat stress on combat vehicle crews wearing protective clothing - has potential for civilians who work in extreme heat, such as steel mills. It also has applications in hospitals when specific patient temperatures must be maintained.

The molded sole concept pioneered for Army footwear revolutionized manufacturing in the civilian shoe industry. For example, the new lightweight polyurethane overshoes designed to replace the Army's cumbersome cold weather "Mickey Mouse" boots, are becoming popular for civilian winter wear.

FUEL SUPPORT FOR JUST CAUSE

LT Edward A. Welch

On 19 December 1989 the United States commenced combat operations against the Panama Defense Force (PDF) of General Manuel Antonio Noriega. This involved the most complex and well coordinated air assault operation since the Vietnam Conflict. It also required a unique approach to aviation refueling.

To allow numerous contingency plans for dealing with the ever-increasing threat to Americans living in Panama, two forward area refuel points (FARPs) were set up over a month before the conflict. One of these was located in Empire Range, 10 miles northwest of Panama City. The other was assembled at Venado Drop Zone near Howard Air Force Base. The control of these two sites belongs to the 193d Support Battalion, although the soldiers at the Venado FARP were primarily from the 1st Battalion, 228th Aviation Regiment.

These points were being operated around the clock by 16 Petroleum Supply Specialists (77F) from A Company, Supply and Transportation (S&T), 193d Support Battalion, Fort Clayton, Panama, and 10 from the petroleum, oils, and lubricants (POL) section of 1/228th Aviation. Normally, an operation of this scale would require many more personnel. However, intensive training and operational missions in the previous months had increased both the speed and efficiency of these soldiers. At 2300 hours on 19 December, the FARPs were informed of the impending operation.

Combat At H-Hour

At 0038 hours on 20 December, the soldiers operating the Empire Range FARP became part of the "war story" of Panama. An AH-1 Cobra attack helicopter and a OH-58 Kiowa scout helicopter screamed over this position at treetop level. After reaching a point three miles up the canal, they began a devastating attack on a PDF stronghold. This base had mortars that were easily capable of reaching the collapsible fuel tanks of the Empire Range FARP. As the Cobra fired a wall of tracer rounds into its target, a huge explosion rocked the area, and flames leaped into the air from the enemy's mortar position. This attack prevented indirect fire from being directed at Empire Range FARP.

By 0230 the first helicopters were arriving for fuel. They showed severe signs of the ferocity of the fighting. Every helicopter had sustained battle damage from enemy rounds. One pilot even said that a bullet had come through the floor of his UH-60 Blackhawk, gone through the tip of his boot, and out of the nose of the aircraft.

At 0315 reinforcements arrived on site from B Company (direct support maintenance) to man the perimeter since the Petroleum Supply Specialists were totally involved with refuel operations. Over 25 aircraft were either being fueled or were standing by at one point. There were so many helicopters on the cramped landing zone that the soldiers at one defensive position had to signal a Blackhawk that was about to land on their location.

The story was much the same at the Venado FARP. Seemingly never-ending, flights of helicopters were rotating in and out of this landing zone. The credit for the successful traffic flow rests with the U. S. Army forward air traffic controllers of the 195th Air Traffic Control Platoon attached to each FARP.

Approximately 40,000 gallons of fuel were issued in the first 24 hours at these two large-scale hot refueling points. This large amount seriously depleted the reserves of jet petroleum fuel (JP-5) on hand at the FARPs. Several armed convoys of trucks were sent to pick up fuel from Howard Air Force Base. The JP-5 they delivered was able to sustain the Empire Range FARP until it was disassembled on 24 December 1990.

Rio Hato, PDF Base

Rio Hato was the largest PDF base in the country. It was home of the Macho de Monte (the unit credited with putting down the October 1989 coup attempt against General Noriega). Some of the bloodiest fighting occurred here in the early hours of 20 December when Task Force Red, Romeo (3d Battalion (-), 75th Infantry Regiment (Ranger)), jumped onto the runway while under intense ground fire.

After eliminating all of the enemy strongholds on the

base, the Rangers were relieved by units from the 7th Infantry Division (Light) (ID(L)). It became apparent that a FARP would be needed at Rio Hato to support the continuing air assault missions that were being flown. The airfield seizure package from the 1st Corps Support Command (COSCOM) was given this mission. During Operation Just Cause this element from Fort Bragg, NC, was attached to the 193d Support Battalion.

By the 24th of December this FARP was running critically low on the fuel. A convoy with one heavy expanded mobility tactical truck (HEMTT) tanker, one 5,000-gallon tanker, one HEMTT wrecker, two Military Police high mobility multipurpose wheeled vehicles (HMMWVs), and the convoy commander's vehicle departed from Fort Clayton. The trip involved driving 75 miles over an unsecured route under the cover of darkness. An Air Force A-37 Dragonfly attack aircraft flew cover for the mission. Reflective "glint" tape had been attached to the vehicles and soldiers so that when lit with an infrared spotlight from the aircraft, the tape would glow through night vision goggles. (This method of identification was used extensively during the Panama Conflict to help avoid friendly fire.) During the convoy the 5-ton tractor hauling the 5,000-gallon tanker became disabled due to a ruptured fuel line. The convoy commander split the convoy, taking the HEMTT tanker and one HMMWV "gun jeep." The other HMMWV guarded the disabled tanker until another 5-ton tractor could return from the rear. The HEMTT wrecker towed the stricken 5-ton back to Fort Clayton. The first tanker rallied into Rio Hato at 0130 Christmas morning. It was immediately off-loaded into the 500-gallon collapsible drums at the FARP. The area was still "hot" at this point with occasional sniper or mortar fire, but the perimeter was closely guarded by elements of the 7th ID(L). The vehicle crews were able to get their first rest since the invasion started — only 4 1/2 hours in nearly five days. All attempts the next morning to establish communications with the 193d Support Battalion tactical operations center (TOC) from the 7th ID(L) proved futile. The fate of the second convoy element was not known until 0900 when the 5,000-gallon tanker and the other HMMWV rolled into the fortified compound at Rio Hato. All of the vehicle crews were tired, but otherwise intact.

On the return trip the tankers received sniper fire halfway to Panama City. Being shot at by General Noriega's Dignity Battalion definitely was not the kind of Christmas these soldiers had visualized just a week before. The convoy sustained no casualties or damage.

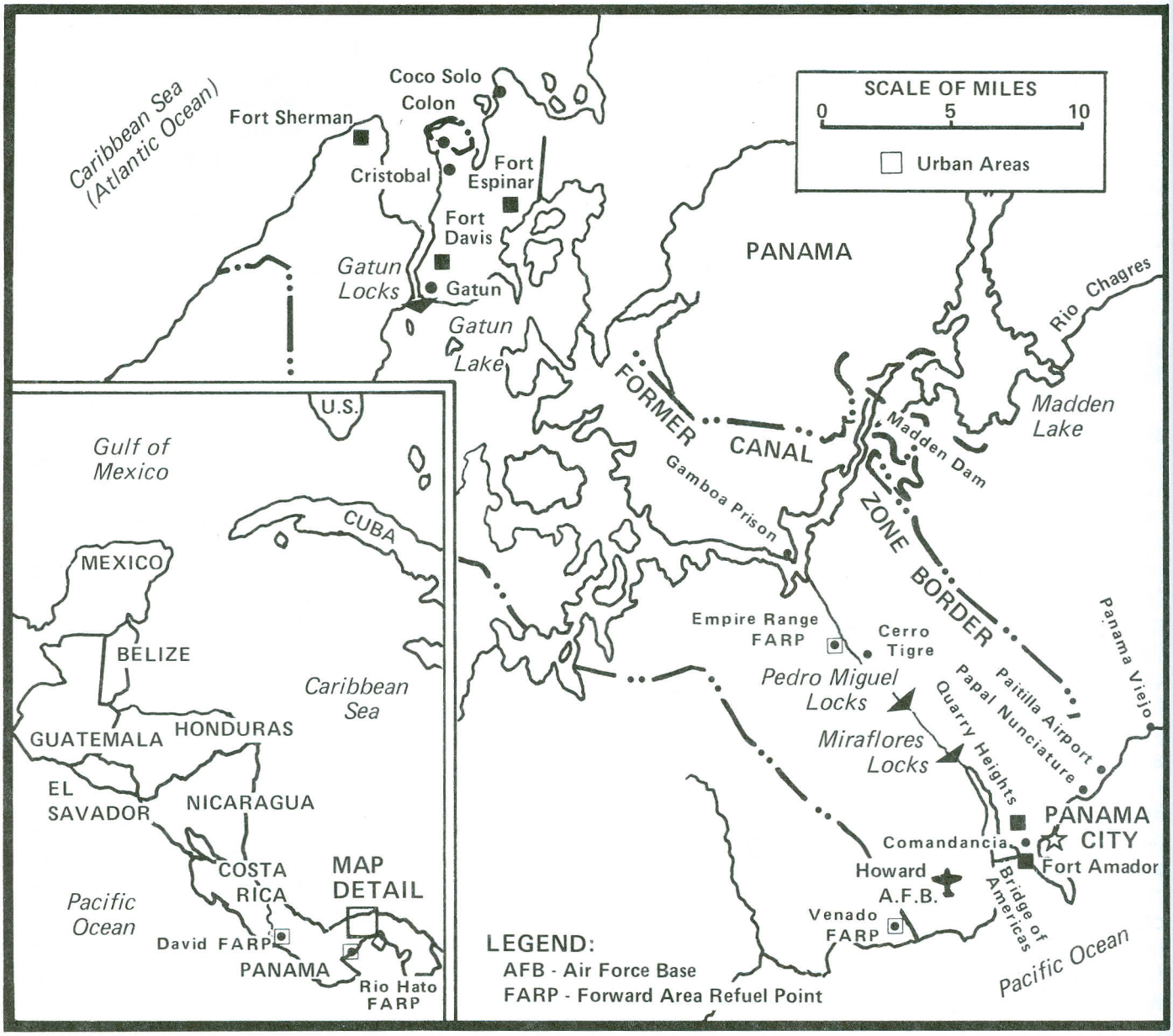
Later Christmas Day the decision was made to move the equipment from the recently disassembled Empire Range FARP to Rio Hato. The two forward area refuel equipment (FARE) systems at that site did not have sufficient storage capability to keep up with the missions. A fuel system supply point (FSSP) was loaded on two stake and platform (S&P) trailers. These trucks were accompanied by two HEMTT tankers, two 5,000-gallon tankers, and the same HEMTT wrecker, and HMMWV escorts that had been on the earlier convoy. Actually, the majority of those who had been on the Rio Hato convoy less than 24 hours earier were in this one. This was due to the petroleum platoon having less than 70 percent strength at the time.

The convoy arrived without a hitch, and was off-loaded at first light on 26 December. The convoy commander then received new orders from a 1st COSCOM petroleum officer who had flown to the former PDF base. Another FARP was needed in David, Panama, in the province of Chiriqui. The FARP was needed to support on-going missions near the border with Costa Rica, and it had to be set up in the next 24 hours.

David Airport, Panama

A PDF base was located at the David Airport 35 miles from the Costa Rican border. It had been taken virtually intact by the Rangers and on 26 December was occupied by the 7th ID(L).

A six-soldier POL team was handpicked and flown by C-130 to David from Rio Hato on the same sorties that carried the infantry. The palletized FARP consisted of two 10,000-gallon collapsible tanks, one 350-gallons per minute (gpm) pump, one 350-gpm filter/separator, and enough hoses and fittings to set up four refueling points. This and all of the necessary safety equipment fit on four 463L pallets. DD Forms 1387-2 (Special Handling Certification) were filled out on the filter/separator and fire extinguishers; and the fuel pump was drained before load-



Adapted From *Soldiers in Panama: Stories of Operation Just Cause*

ed on the aircraft.

The David FARP was too far from the main military POL supply point in the country, Arraijan Tank Farm near Panama City, to truck in the amount of fuel needed. Additionally, the majority of the 250-mile route from Panama City to this provincial capitol on the border with Costa Rica was unsecured. This was accentuated by the fact that the only tactical ground bulk fuel transporters in the country were seven 5,000-gallon tankers and seven HEMTT tankers from A Company (S&T). Most of the tanker operators were scattered across the country operating FARPs and ground refueling equipment.

The POL team at David devised a plan to fly in JP-5 using C-130 sorties and "Wet Wing" refuel operations.

'Wet Wing' Operations

"Wet Wing" refueling operations are not a new concept, but they have never been used on such a large scale. It is a technique that involves defueling a "host" aircraft, in this case U.S. Air Force C-130 Hercules cargo plane, for the

purpose of refueling numerous smaller aircraft.

At David, C-130s taxied up to a FSSP located on the edge of the tarmac. Once the Air Force flight and ground crews had placed the airplane in position, Petroleum Supply Specialists would attach a D-1 aviation refuel nozzle to the fuel port on the side of the C-130. The plane's flight engineer would then begin defueling by engaging the onboard booster pumps in the wings of the aircraft. The power necessary for this operation came from a ground power cart provided by the Air Force.

All coordination for sorties and delivery schedules were made directly with the Airfield Tactical Operations Chief (ATOC), an Air Force major collocated at the David Airport. The ATOC contacted Howard Air Force Base to ensure that incoming flights were loaded with the maximum loads of fuel they were able to carry with their specific cargos. This allowed the David FARP to meet all demands placed upon it for fuel by Army aviation. Each Air Force aircraft dropped as much JP-5 as it could and still make the return flight to Panama City.

A major factor in the efficiency of the operation was that the 7th ID(L) kept the fuel point informed of scheduled air assault missions through their aviation operations officer (S3 Air) at David. It allowed time to react by ensuring that inventories of JP-5 on hand met demand. Improper coordination could have led to either mission failure due to fuel shortages or needless reduction of incoming cargo due to excess fuel deliveries. This coordination was essential to the success of the FARP.

POL Lessons From 'Just Cause'

The main logistical lesson learned from the FARP used in David, Panama, is that for large-scale air assault operations in a remote location, where trucking is not feasible, the practical solution to the problem of refueling is the "Wet Wing" operation.

A FARE system is well suited for use in small ground or air operations where limited quantities of fuel are needed. However, in long-range or large-scale missions flying 500-gallon collapsible drums (blivets) in to resupply the FARP **will not work!** The helicopters will burn nearly three-fourths of the amount of fuel they are slinging in.

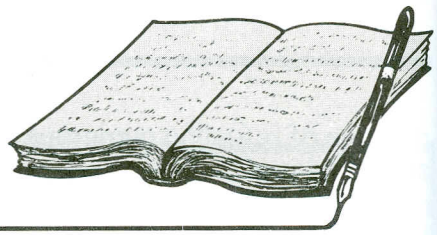
Another disadvantage to sling loading fuel in combat is that a helicopter laden with a blivet loses a great deal of its maneuverability and speed, both of which endanger the aircraft and its crew. Also, if these helicopters are not burdened with the mission of hauling bulk fuel, they will be free to perform other combat and combat support missions such as transporting soldiers and hauling other high priority supplies to remote locations. More of this type of mission would be possible if the majority of fuel to sustain an air assault operation could be flown in by fixed wing aircraft.

This also allows the 500-gallon collapsible drums to be used for other specialized missions. The drums could be filled and sent to resupply any unit that has generators or other ground equipment. In combat, tank and pump units (TPUs) and other tank vehicles are often totally committed refueling high priority items such as armored personnel carriers, tanks, and landing craft and may not be available to supply smaller missions. If units such as signal detachments are given those drums, it allows them to be self sustaining for extended periods of time. Thus, two missions, ground and aviation fuel resupply, are facilitated through the use of "Wet Wing" refueling operations. Operation Just Cause showed that air assault will play an integral role in low intensity conflicts that may arise in the future. An official contingency for refueling large-scale air assault and aviation forces needs to be adopted since fixed points, tankers and FAREs are not always a viable solution.

Meanwhile, doctrinal acceptance of the "Wet Wing" refueling procedure will help prepare the Quartermaster Corps for the logistical challenges of combat into the 21st Century.

LT Edward A. Welch was Petroleum Platoon Leader, A Company (Supply and Transport), 193d Support Battalion, Fort Clayton, Panama, during Operation Just Cause. He is a graduate of the Quartermaster Officer Basic, Quartermaster Officer Advanced and Airborne Courses. He is currently assigned to the Office of the Quartermaster General, Fort Lee, Virginia.

PANAMA JOURNAL



CPT Mark E. Drake

Editor's Note: The author was the Commander of Company C, 7th Supply and Transport Battalion, 7th Infantry Division (Light) during Operation Just Cause. This article is part of a journal he kept during the conflict. CPT Drake deployed to Panama on 1 Oct 89 to participate in Operation Nimrod Dancer and remained until 9 Feb 90.

19 December 1989, TUESDAY

I have decided to start a journal because I have a gut feeling something is going to happen in the next couple days because of the incidents that occurred over the past weekend.

Les [CPT Hahn, 3d Brigade Forward Area Support Coordination Officer (FASCO)] returned after a week of rest and relaxation (R&R) at home. After he returned, all hell broke loose when the Panama Defense Force (PDF) shot and killed a U.S. Officer and arrested and beat up another officer and his wife. All units in Panama went on full alert and my people began the mad rush of issuing ammunition to all the units and linking up units with trucks to move them to their contingency positions. We went on alert at 2145 hours Saturday night and finally stood down and began to get some sleep about 5 or 6 the next morning. We are still on a one-hour string; we must be able to execute our contingency missions within one hour.

Now we are all just waiting for Noriega [Panamanian General Manuel Antonio Noriega] to take some action blatant enough to invoke an active U.S. response. Unfortunately, Noriega is not stupid enough to do anything of the sort. We have been literally pointing weapons at each other for quite some time, eight months to be exact. The only reason they are getting away with incidents like Saturday's is that U.S. personnel were in a restricted area. However, until now, the PDF merely escorted U.S. personnel out of the restricted area whenever someone became disoriented in downtown Panama City.

Les spent some of his time back at Fort Ord, CA, coordinating with the division support command (DISCOM) staff. He talked with his boss LTC Beebe [Division Support Command Operations Officer] and the division ammunition officer about issues in Panama. With our division field training exercise (FTX) moved from January to May, COL Wright [DISCOM Commander] will probably visit us for a week in late January (just before or during my R&R trip home). He also mentioned that my boss LTC Jones [Commander, 7th Supply and Transport (S&T) Battalion] will not be able to visit because he is currently officer in charge of our alert support package which is part of the division ready brigade (DRB) in case the division has to execute another contingency operation in a different area of the world. The 2d Brigade does not come off DRB until after the first of the year. It sounds like he will probably come with COL Wright. It will be nice to see and talk with LTC Jones since I have only been at home station a month since he took command of the battalion in July.

The brigade executive officer (XO) just came by to ask how many days of rations we have in stock. It is very unusual for LTC Hamilton [XO, 3d Brigade] to walk all the way down to our office and ask a simple question like that, when he could have called us on the phone. Anyway, I have 10 days of rations plus, the 3d Brigade units have three days in case anything happens. Maybe my gut feeling is right.

Just received a phone call from the Brigade S3 stating that they need me as soon as possible. There is also a planning meeting with COL Kellogg [Commander, 3d Brigade and also the Commander, Task ForceAtlantic] at 1800 hours. My gut is telling me that this is not just any ordinary planning meeting, due to the fact that six UH-1Hs with their machine guns mounted in their doors are landing behind our office.

I just arrived back from talking to the Brigade S3. He wants me to start putting units into their contingency positions. He gave me a list of which units, times and locations for link-up. Right before I left, he took the list back from me and wrote "rehearsal" on it, telling me to make sure that my truck drivers take all of their equipment because they might be out for a couple of days. My gut feeling is getting stronger because as many times as we have practiced our operations plan (OPLAN), they never once put rehearsal on my mission sheet. In any case, my drivers take all of their equipment. It's brigade policy.

We just completed moving one company into position. I talked with the first sergeant today back

at Fort Ord. I had a couple of missions he needed to accomplish back there for me. Before I hung up the phone, I told him that he went home at the wrong time and might miss the festivities. Well, it's 1715 hours, I must sign off and get dinner before the meeting with COL Kellogg.

20 December 1989, WEDNESDAY

My gut feeling was right! I was not as surprised as I thought I would be when they told us that we have been given the word to execute our OPLAN. I had a feeling this would happen due to the PDF killing one U.S. officer, and beating another and his wife on 16 December 1989. So,last night we executed an operation plan that our division began planning almost two years ago and refining ever since.

COL Kellogg discussed the execution of the OPLAN at last night's meeting. He, the XO, and the Brigade S3 had known that the operation would go down several hours in advance and begun phased implementation of the OPLAN (moving the one unit into position early yesterday). At the 1800 hours command meeting, COL Kellogg announced that JTF Panama OPLAN 90-2, the offensive take-down of all PDF forces, would be implemented effective 0100 hours, 20 December 1989 and that all PDF and armed civilians would be considered hostile effective H-Hour minus 30 minutes (0030). The meeting lasted about an hour. We were instructed not to brief our soldiers until 2100 hours. I had two hours to ponder on how I was going to tell my soldiers that we were going into battle. My biggest challenge was how to change their mindset from a peacetime exercise using MILES (Multiple Integrated Laser Engagement System) equipment to the real thing. I also had to make the point that one of us might have to shoot at someone and that it was very possible that we will be shot at. I gathered all the soldiers up at 2055 hours. I told them that we have been given the OK to execute our OPLAN at 0100 hours, 20 December 1989 (less than four hours). I went over the rules of engagement, and what threat we could expect here at Fort Sherman, Colon City and Coco Solo. I told them to take all their instructions from their squad leaders and carry them out to the best of their ability. My last words to the soldiers were "We are all in this together and my goal is to take everyone back to Fort Ord alive. You are about to become a part of ***history****, good luck and God bless you." I believe this is the first time since I've been in command that each and every soldier's eyes were focused on me. I instructed the noncommissioned officers (NCOs) to break their squads down into buddy teams. I did not want any soldiers left by themselves at any time.*

The company had two major missions prior to H-Hour. First, it ensured that all units received all their basic load of ammunition before moving out to their combat locations. This used every truck (18) within the task force which have been put under my control. All units departed on time with as much ammunition as they could carry.

Our infantry has taken a few casualties, but they have done a super job of overwhelming the PDF forces in our area of operations, in spite of one-to-one strength ration against fortified positions. Admittedly, we had total control of the air and initiated fire on the PDF facilities with two Vulcan 20 millimeter (mm) antiaircraft gattling guns in the direct fire mode. After initial resistance in the face of overwhelming firepower, a majority of the PDF soldiers surrendered. There are still some pockets of resistance in our area and we must still clear the city of Colon, including the 2d Military Zone Headquarters, police and DENI (defense/police investigation types), and drug dealers and miscellaneous thugs and looters.

Just heard over the radio that Mike [CPT Beech, Commander, Company A, 4-17 Infantry Battalion], my buddy, has been wounded, but they do not know how bad. We have one confirmed friendly killed in action (KIA) and several wounded who are at Coco Solo Hospital (where our medical company is located) or have been evacuated by helicopter to the Field Surgical Hospital that XVIII Airborne Corps has established at Howard Air Force Base. God bless them.

21 December 1989, THURSDAY

I called over to the hospital where my buddy Pete is in charge to see if any of his records have Mike's name on them. He checked them out and said no. I asked him to keep an eye out for him and call me if he hears anything from his medics in the field.

We are in the planning stage to launch another offensive in the city of Colon sometime tonight. I have been working out the details with the Brigade S3 reference moving the soldiers in place by trucks. At this point, I have three trucks out of 18 that we sent out on 19 December 1989 back. We still have not found Noriega. I have no doubt in my mind that we will find him. The question is whether he will be delivered alive.

The infantry has carried out its orders in an

outstanding manner. Now it is up to us to sustain them. The next couple of days the company will be stressed to their max to ensure that our infantry soldiers and slice elements have the best support that we can possibly provide them. I know we will not let them down!! Our area of operation has been pretty quiet so far today as mentioned, we have been busy resupplying our combat units with food, water, fuel, barrier material and ammunition. Our rations are going fast, due to the fact that we have to feed enemy prisoners of war (EPWs), Panama Canal Commission folks and some local civilians, currently numbering 450 and growing rapidly as well as the soldiers. Lesson learned: ensure when planning for contingency operations that you consider EPWs and civilians in your head count. We have taken over the Gatun Tank Farm (our fuel source) and the Self-Service Supply Center (SSSC) store located near Fort Davis. I instructed 1 LT Leonard [Platoon Leader, Company C, 7th S&T Battalion] to cut the locks and put our own on. We're tracking what we draw for reconciliation purposes: that way, when the civilians return at those sites to work we won't screw up their records or accounting system. It took three hours for my fuel handlers to figure out what valves to turn to get fuel. Some of the valves were so big that it took three people to turn them, but the bottom line is we have fuel (JP8) for our vehicles and helicopters. MOGAS (motor gasoline) is a problem because for the last three months we have been receiving deliveries from the Pacific side and with the roads blocked and all aircraft dedicated to the ground forces we must come up with an alternate plan.

22 December 1989, FRIDAY

The operation for Colon as been put on hold until sometime today. We were very busy yesterday as anticipated. We have not received any supplies from the Pacific side since H-Hour. Les and I game-planned this would happen (back in November) due to the fact the roads would not be secured, and air support would go to the ground forces (as I mentioned), so we beefed up our stocks just in case we had to execute the OPLAN. Chalk one up for two old GRUNTS!! We still have enough food on hand for two or three days. We have ordered a resupply of AT-4s and LAWS (light antitank weapons). We are expecting resupply of Class I (rations) and Class V (ammunition) to arrive from the Pacific side via LCM (landing craft, mechanized) sometime Saturday.

Our soldiers moved into the City of Colon to filter out the remaining PDF. The 3d Brigade has control of the city. It was a great operation conducted by the soldiers. The locals were very helpful in pointing out where the PDF had weapons stored. Once again we have captured hundreds of weapons and ammunition. The press Cable News Network (CNN) is on the ground at the high school football field (in Colon) where the last of the EPWs were consolidated earlier today. This is the first time that the press has been brought into northern Panama (our area of operation). The hunt for Noriega continues. Lots of leads in all directions due to the bounty put on him by the president. COL Kellogg told us that Noriega was in Colon the day prior to the kickoff of Operation Just Cause. We have been conducting raids and air strikes on a house and hotel where a very reliable source says he is hiding. Today, the trucks brought in five loads of weapons such as AK-47s, a 1928 Thompson machine gun, revolvers, antitank rockets, 50-calibers, etc.

Les and I have been running the combat service support (CSS) operations and reporting our needs to the division cell. They only deployed with one G4 Rep initially, so Les sent Juan [CPT Sans, FASCO Operations Officer, 3d Brigade] to help out. That was a good move due to the fact that we are the only brigade that presently understands XVIII Airborne Corps reporting procedure. We just finished Exercise Market Square with them in September prior to our deployment the 1st of October 1989. We have both been working with about two to three hours of sleep within each 24 hours. We have both pulled a couple of 22-hour days. I am learning a lot from Les; he has been a great teacher. In a couple months, I will be giving up command and replacing him as the 3d FASCO. This experience has been most valuable to me and the company. Today, I finally received confirmation that all my truck drivers are alive and well. I have only seen them about three hours since Tuesday night. They have been doing an outstanding job!

I called back to Fort Ord to give LTC Jones a thumbs up on all of our people in Panama. My soldiers are dealing with the stress well and they are all doing an outstanding job! I am proud of each and every one. I had the chance to talk with Korynn [the author's wife] for a couple of minutes to inform her to initiate our Pink Bayonet Roster to notify the wives that everyone is OK so far and call all the single soldiers' parents or whomever they put on their 3X5 card they filled out before we deployed.

25 December 1989, MONDAY

Merry Christmas! The last few days are a gray haze. Les and I have been working almost continuously. I finally stopped functioning about 2300 hours last night. I couldn't remember when I had slept last. According to the duty log, it was sometime on the 23d, on the couch in the office. Good news, Mike was wounded in the arm and he is doing fine. He is still with his company. What a relief.

COL Kellogg reported at 0915 hours that the city of Colon is secure and that no looting exists. Mop up operations will continue throughout the day. All active threats in the city were neutralized by evening and another 200 EPWs were captured or surrendered. Most of them gave up and turned over their weapons.

Civil-military operations (CMO) began in Colon almost immediately. We had a five-hour CMO planning meeting that started at 1900 hours. We brainstormed over the responses to requests for support that might be asked by the New City Council members of Colon. We also developed our own plans for returning the city to normal without jeopardizing our missions. Since H-Hour, we have had Colon sealed off from ground, sea and air escape. We had good intelligence that Noriega had been in Colon the day before the operation started and we cannot allow 50,000 civilians and PDF to wander around. Our major CMO objectives are to help the people help themselves. Our major areas of support are as follows: food, medical assistance, sanitation/area damage control, building a new police force, protecting personal property and reestablishing/maintaining normal city functions. We are also implementing the "cash for weapons" program directed by President Bush.

My friend Pete [CPT Garguilo, Commander, Company C, 7th Medical Battalion] is in charge of medical support: restocking the hospital with supplies and providing field medical teams at locations throughout the city to treat wounded and sick civilians. I have had SPC Campos [Graves Registration (GRREG) Specialist, Company C, 7th S&T Battalion] attached to Pete since the second day of the invasion to assist him with the dead bodies. I can honestly say that I never thought that the six-hour GRREG class at the Advanced Course would come in handy. My eyes water up and my gut turns every time I see or handle the bodies.

I was in charge of the food program, but I handed it over to the 4-17 Infantry S4 since his battalion controls the city. I have made all the contacts for him. I have coordinated for about 20,000 turkeys and canned food to be donated from store owners in the Free Zone. The Panama Canal Commission has helped me out tremendously by providing me a list of ships waiting to move through the canal that contain food. I contacted the ships' captains and asked them if it is possible for the U.S. Army to purchase their goods. If they say yes, they have priority to dock and the contracting officer takes over. Very interesting process. I attended a joint Panama/U.S. forces council meeting today at the Colon Municipal Building. I had a brief chance to see Mike. He is doing fine. During the meeting, the acting mayor was called by the new president of Panama and was telephonically confirmed as the new city mayor of Colon. I arrived about 30 minutes late due to another meeting, so there were no chairs available for me to sit, so I sat on a small brown box. Someone leaned over and told me that I was sitting on the $50,000 they intend to use for the "cash for weapons" program. Needless to say I had the most expensive seat in the house!

This morning Les informed me that last night he instructed SGT Anes [Warehouse NCOIC, Company C, 7th S&T Battalion] to go to Clothing Issue Facility (CIF) at Fort Davis and obtain 200 sets of BDUs (battle dress uniforms) to outfit the new police force of Colon. If we would have let them stay in civilian clothes our soldiers might mistake them for members of the Dignity Battalion.

Last night we received mail for the first time since the 20th. The Christmas stockings and goodies arrived for the soldiers that Korynn sent, so 1LT Leonard and I went and delivered them to the soldiers personally and wished each of them a Merry Christmas. The soldiers really enjoyed the stockings.

The news that Noriega turned himself into the Papal Nuncio in Panama City spread to every soldier within five minutes. We have captured photos from the Military Zone 2 Headquarters in Colon of people being tortured. I sure hope the Pope realizes that Noriega is a criminal and not a political prisoner.

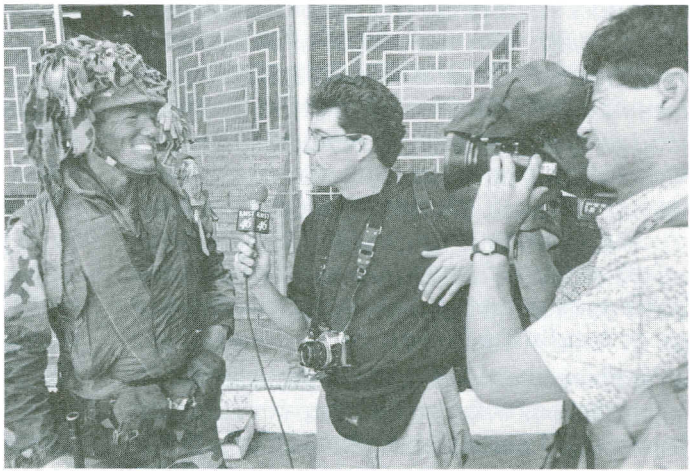
28 December 1989, THURSDAY

Today I went to the PDF logistics warehouse at Cerra Tigre, near Gamboa. I went looking for more uniforms and equipment to refit the new police force in Colon. I did find the things I needed to outfit the police force. It was fun looking at everything they had in stock; it looked like we interrupted their Christmas packing. There were stacks and stacks

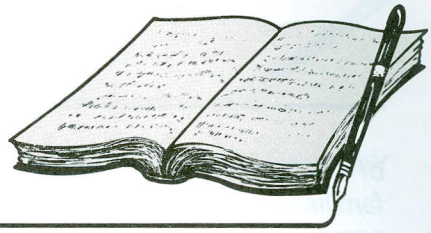
A helicopter gunner's aerial view of Panamanian terrain with Miraflores locks in the background

Soldiers from Fort Ord, California, opened this wall for access to a baseball diamond used as a helicopter landing field.

'Weapons for Cash' turned in at Panama City

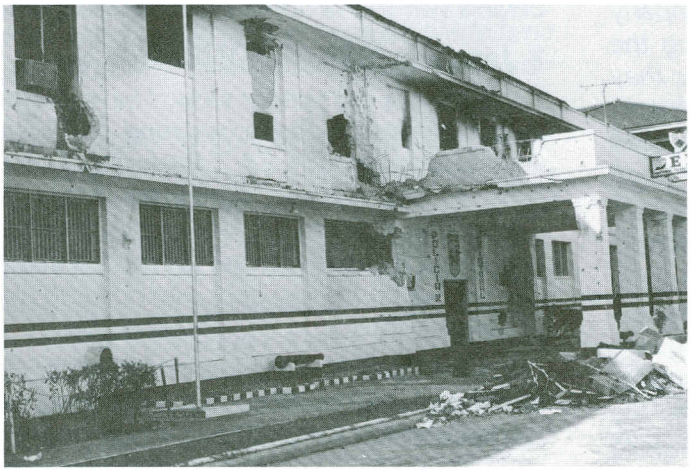


Civilian press interviews U.S. soldier



Aerial view of Panama Defense Force installation near Colon

U.S. soldiers and Panamanian police photographed while patrolling Panama City streets



Damage to headquarters of Panamanian military police when overtaken by U.S. troops

Thousands protested when Panamanian General Noriega stayed in country

of Christmas gift boxes for the PDF soldiers and families containing toys, women's shoes, liquor and personal hygiene supplies.

We finally started getting a reasonable amount of supplies in from the Pacific side. The thing we do need and did not receive is MOGAS. The Navy boats are demanding more than we have on hand and more than our capacity to store. I informed 1LT Leonard to commandeer a 5,000-gallon MOGAS tanker I ran across at the boat landing site by accident. There was no tractor to pull it and we needed MOGAS very badly. I instructed 1LT Leonard to use the aviation bobtail and bring the tanker to our site. We found out later that the tanker belonged to the Fort Davis transportation motor pool (TMP). We took 1,450 gallons from it and returned it to the TMP motor pool. I was not about to let a civilian-ran motor pool get MOGAS before us when we are still conducting combat operations with the Navy speed boats.

1 January 1990, MONDAY

Happy New Year! ! Business has been extremely slow for the last few days. We are supporting the Navy SEALS (sea-air-land teams) and one company from 4-17 Infantry that is presently clearing the coastal areas east of Fort Sherman. So far they have covered about 200 miles and the PDF forces have been waiting for us to show up so they can surrender. Our highest demand items have been MOGAS for the SEALS' speed boats (they suck down 700 to 900 gallons each mission), Meals, Ready-to-Eat (MREs) and water for starving local civilians. As long as I have enough in stock, I don't mind giving them out to the locals.

COL Wright and the DISCOM sergeant major paid us a visit on 30 December 1989. It was the first time COL Wright has had the opportunity to visit us. Les and I gave him a quick down and dirty brief. He asked if we had any problems and then proceeded to spend his remaining time visiting with the soldiers.

LTC Jones came by on 31 December 1989 to visit. I had not seen him since 13 October 1989. I had him give commander's coins to four of my soldiers for doing an outstanding job. I thought it would mean more if a lieutenant colonel presented them rather than a captain. He gave them to SPC Campos, SGT Anes, SGT Smith [Ammunition Transfer Point (ATP) NCOIC, Company C, 7th S&T Battalion] and SSG Ahlefeld [Squad Leader, D Company, 7th S&T Battalion, attached C Company, 7th S&T]. SPC Campos is my GRREG Specialist. He was in charge of processing 80 to 120 PDF casualties. He did an outstanding job! SGT Anes, who is on loan from HSC (Headquarters Supply Company), runs my warehouse. Being a brand new E5 she has learned a great deal about how to handle stressful situations. SGT Smith runs my ammunition supply point. She is also a new E5. She is responsible for the accountability and issue of the ammunition for the entire task force. She also has done a great job! SSG Ahlefeld is my truck master. He is responsible for all truck missions within the brigade area of operations. He has done a super job keeping all the trucks mission capable. If it was not for the cooperation of those individuals, life could have been really hectic particularly with the first sergeant back at Fort Ord and no one else to provide senior NCO leadership. They did a super job and I am proud to have served with them.

To celebrate the New Year, I had the cooks bake a cake and make Kool-Aid for the soldiers. We sat around last night eating cake and drinking Kool-Aid talking about past holidays, our families and what a bizarre war this is compared to our expectations.

3 January 1990, WEDNESDAY

Today is extremely slow. I have played six or seven games of chess, winning and losing. COL Archer, former 7th S&T Battalion Commander, now at the Army Combined Arms Support Command at Fort Lee, VA, came by yesterday to talk about lessons learned during the invasion. We did not hold anything back and covered everything in detail.

Yesterday morning Les attended the first command and staff meeting since the invasion began. He told us that COL Kellogg is extremely pleased with the effort and the operations across the board. The 3-504 Airborne is redeploying back to Fort Bragg, NC, later this week. The SEALS are leaving in the morning. 3/17 Infantry, still at Fort Ord, is coming in later this month to replace 4-17 Infantry. We are still scheduled to leave Panama on or about 15 February 1990. We assume DRB on 22 February, so the pace is not going to slow down in the near future. Going into DRB is going to be very tough this time since we have been deployed for seven months. The single soldiers will not have a chance to go on leave to visit family until the end of March. The unapproved plan for now is to leave a full brigade from our division in Panama for at least a year until the new government is "stabilized."

M113 armored personnel carrier in support position in Panama City

CSS LESSONS FROM OPERATION JUST CAUSE

CPT Robert J. Gaddis

On 20 December 1989 elements of the 75th Infantry Regiment (Ranger) and the 82d Airborne Division conducted a parachute assault into the Latin American nation of Panama. Together with the Panama-based 193d Infantry Brigade (Light), they initiated one of this country's largest military operations. At one point over 27,000 U.S. servicemen were deployed to Panama. Operation Urgent Fury in Grenada, Operation Just Cause and Operation Desert Storm in Saudi Arabia have been the major tests of how the all-volunteer U.S. Armed Forces fight since the end of the Vietnam Conflict. Therefore, we have a valuable opportunity to recognize our strengths and weaknesses. We must learn from the mistakes made in Panama and apply those lessons. My intent in writing this article is to provide a summary of logistical and tactical considerations when moving supplies forward and to reinforce the lessons of Operation Just Cause. Maybe then we can ensure that the mistakes of Operation Just Cause will not be repeated in other conflicts.

Background

Operation Just Cause was primarily an urban operation. For many soldiers the conflict was brief, lasting only several hours. For others, enemy action continued for several days and gradually dwindled over a period of two weeks. The enemy, the Panama Defense Force (PDF) and the paramilitary "Dignity Battalions," fought well in some areas and in others offered only token resistance. The first two days of the operation completely destroyed the PDF command and control structure. As a result, many units of the PDF, abandoned by their officers, simply changed their uniforms for civilian clothes and blended in with the populace. On the other hand, the Dignity Battalions continued fighting alone or in groups for up to two weeks. Their actions were mainly limited to sniping at U.S. soldiers and vehicles, as well as looting, arson and robberies.

Operation Just Cause validated the need of combat forces to have supplies "pushed" forward to them when they are critically engaged in combat. For most units in Panama, a supply package push was only essential during days two through five of the invasion. Logistically, this was the most critical time of the operation. Most important during this time were Class V (ammunition), Class I (rations), Class III (petroleum, oils and lubricants (POL)) and to a lesser extent Class IX (repair parts). The reasons these classes of supplies were most needed was due largely to the environment in Panama. Military operations on urbanized terrain (MOUT) increase the ammunition consumption. Infantry units engaged in Panama City found that they had seriously depleted their basic load of certain ammunition items, particularly 5.56-millimeter (mm) (for the M249 squad automatic weapon), 7.62mm (for the M60 machine gun) and .50 caliber (for the M2 machine gun). Because of the tropical climate of the region and the large amounts of equipment carried by combat soldiers, water consumption increased. Class I usage increased as units were tasked with feeding large numbers of civilian refugees. As anticipated, mechanized and armored forces rapidly consumed Class III. Consumption of POL also increased because of reliance on cargo trucks and High Mobility Multipurpose Wheeled Vehicles (HMMWVs) for troop transport. Class IX was not critical due to the short duration of the conflict.

Although the lessons learned that I present here are not particularly new or insightful, they were not practiced at one time or another during Operation Just Cause. These lessons fall into two broad categories: command and control and training.

COMMAND AND CONTROL

Positioning CSS Assets

Combat service support (CSS) elements of 4th Battalion, 6th Infantry Regiment (Mechanized), assigned to 193d Infantry Brigade (Light), were hit with observed mortar fire. In MOUT, positioning CSS assets is critical. It is often difficult to prevent enemy observation. Therefore, it is imperative to use buildings for cover. Consider using structures such as parking garages for positioning CSS assets. Additionally, 360-degree defense is vital. Positions need to be constructed or dug and reinforced with sandbags, steel or wood. In MOUT the enemy can use buildings, sewers and streets to rapidly mass for an attack. These avenues of attack can be used to hit anywhere in the urban area. What was once a secure rear area can be attacked by an enemy platoon moving through the sewers. CSS personnel may not have the time to react to an attack. Therefore, the perimeter must be covered to the greatest extent possible. The enemy may be wearing civilian clothes. Units need to guard against having civilians in or around their perimeter. For example, a woman looking for a Meal, Ready to Eat (MRE) handout may throw a grenade at your tank and pump unit and jeopardize an operation.

Liaison and Coordination

In one case in Panama, soldiers of the 82d Airborne Division fired upon a friendly convoy escorted by Sheridan Airborne Armored Reconnaissance Vehicles (AARVs). The soldiers had been warned to expect an enemy armor attack. They confused the Sheridans for the enemy armor. The result was one soldier killed before leaders could stop the firing. Fratricide can frequently be prevented in war. Liaison officers are an effective way of ensuring good support and communication while preventing fratricide. Provide for a liaison in the mission planning. Additionally, develop a linkup standing operating procedure (SOP) for joint use. In some fluid situations, liaisons will not be effective. But as a CSS leader, take the time to coordinate with the supported unit. Remember that a soldier who does not recognize or cannot see a vehicle is liable to shoot first and ask questions later.

Navigation

In Panama City, resupply convoys often became lost. This delayed unit resupply in critical times. In an urban environment, military maps (1:50,000 scale) are not effective. A better solution is to request strip maps, or a guide, from the supported unit. Strip maps must be clear and three-dimensional. Number buildings in built-up areas, and include this on the map. The convoy commander must have a copy which includes unit boundaries and target reference points (TRPs). The 193d Infantry Brigade (Light) secured several large city maps and distributed copies. These maps, although not designed for military use, allowed units to oper-

ate more effectively in their areas. Even tourist maps can help in urban areas.

Refugees

After heavy fighting in Panama City, civilian refugees converged on U.S. units for food, medical attention and protection. Refugees can become a significant logistical burden on your unit as well as the units you support. In addition, they are a security risk. Consider refugees in your mission planning. Evacuate refugees to dislocation camps. Leaders cannot afford to use their own transportation assets, nor will military police (MPs) arrive to pick them up. Find out from your higher headquarters where these camps are located and have a bilingual soldier inform the civilians of the location. If no bilingual soldier is present in your unit, request support from higher headquarters. It is in your nature to assist these people, but it cannot detract from mission accomplishment.

TRAINING

Hardening Vehicles

Enemy small arms fire damaged or destroyed many "soft-skinned" vehicles. This can be prevented by "hardening" the vehicles for combat. "Hardening" vehicles also protects the soldiers traveling in the vehicles. The majority of CSS vehicles are not armored. Additionally, CSS personnel are not usually trained in how to protect their vehicles. Do not expect engineers or infantry to assist you with this task, it is your responsibility. Here are some tips on vehicle hardening. Lower windshields to prevent them from shattering in the driver's face. (HMMWVs do have shatterproof glass.) Place sandbags on the vehicle floors and sides. Position earth-filled ammunition boxes around the truck bed. Lash sandbags around the engine compartment. Practice these techniques during unit training. Mission success depends upon vehicles that push supplies forward - protect them.

Logistics Convoys

On at least two occasions, logistics convoys could not get through because of inadequate escort. The convoy's firepower could not suppress enemy small arms fire along the main supply route (MSR). Always arm logistics convoys. All vehicles need a driver and an assistant driver to ride "shotgun." CSS units need firepower and their own escort capability. A solution is for CSS leaders to requisition ring mounts for their vehicles. This will allow mounting of M2 or M60 machine guns. These vehicles can travel in the front and rear of the convoys when no MP or infantry escort is provided. This will help your resupply convoys to complete their missions. Speed is equally important to a convoy. One vehicle hit in a convoy can stop all the vehicles behind it - thus making those vehicles easy targets. Vehicles that are critically hit must drive off the MSR, so other vehicles can complete the mission. Train your drivers on how to react to enemy fire and enemy ambush along the MSR. Plan to encounter obstacles along the route. In Panama City, the PDF made numerous streets impassable by blocking them with vehicles and wire. Frequently, these roadblocks were covered by fire. Train your drivers so that they understand which roadblocks are surmountable. Often the obstacles were crashed through by the convoys, and later cleared by other units in the area.

Labeling Supplies

Many follow-on supplies and equipment were never delivered to units because they arrived without unit designations or were not clearly marked. Leaders need to ensure that all supplies are clearly marked with the unit designation and unit name. Remember that a soldier loading or unloading supplies may not know the unit designation. Brief drivers on who their load is for. Physically separate different loads that are on the same truck. If supplies arrive that are not clearly marked, task your supply section to track the order down if possible. Mission success may depend upon these supplies.

Refueling

Identification and seizure of fuel was incorporated into mission planning for Operation Just Cause. Supporting mechanized and armored forces can strain a unit's POL resupply capacity. Several units eased this burden through the use of captured tankers and fuel. Include this in your mission planning. If approved, clearly mark the tanker with spray paint. Also inspect the tanker before use to ensure different types of fuel are not mixed together. This is an effective means of continuing mission support.

Leadership

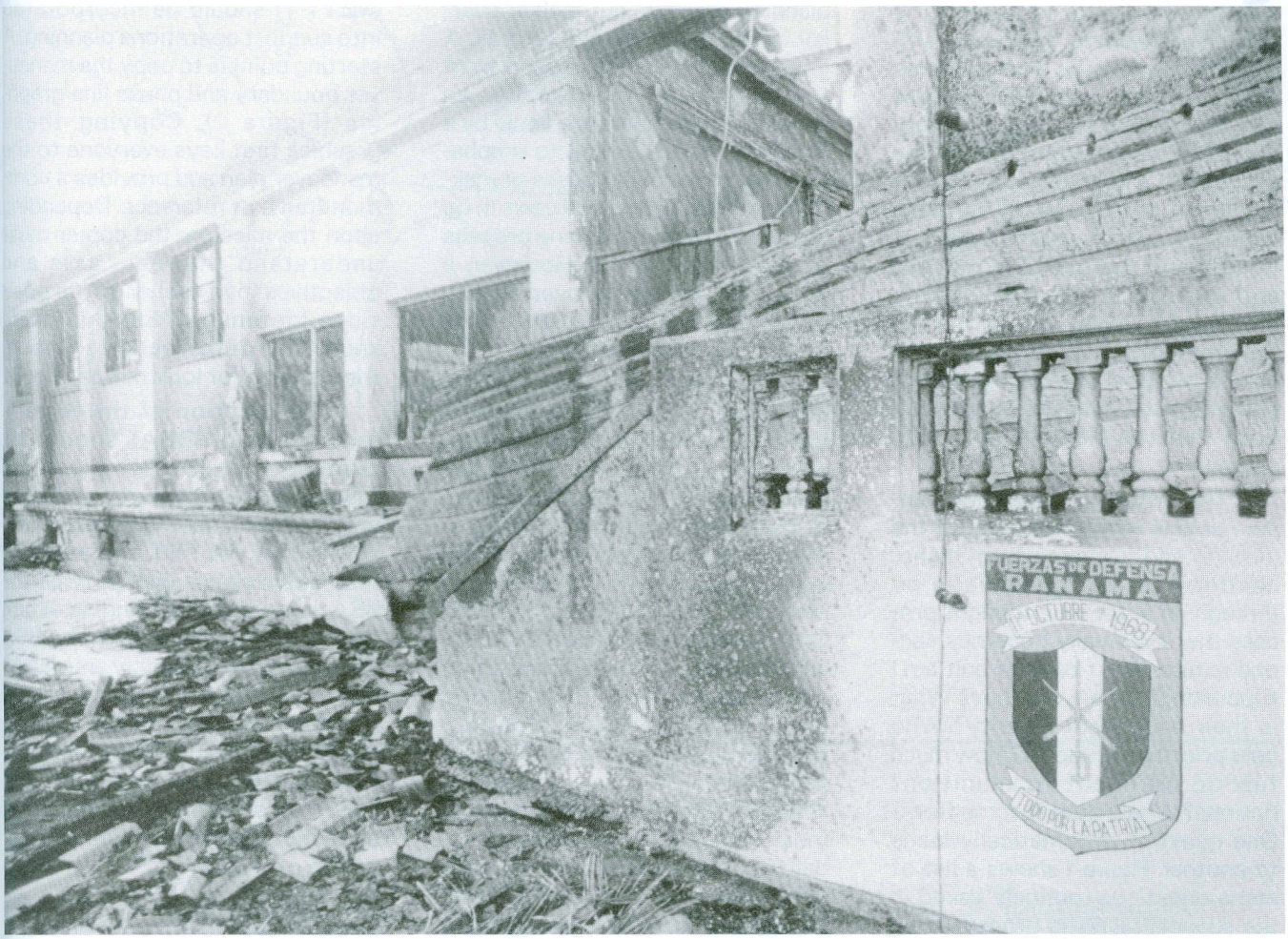
Mission planning for Operation Just Cause envisioned a 72-hour operation. Many leaders tried to keep functioning as long as possible. Sleep plans still need emphasis. Leaders need sleep to be effective decision makers. As in Panama, the 72-hour mission might last slightly longer. Another leadership task is supervision. Leaders did not adequately supervise their soldiers' sanitation practices. Many soldiers developed a mild dysentary as a result. Sanitation training needs more emphasis. In Panama City, many units occupied buildings for their unit's area of operation. Soldiers became lazy and defecated in secluded corners of buildings. Toilets may or may not be functioning during MOUT. Therefore, leaders must ensure that a latrine is constructed and is being utilized.

Leaders must ensure their soldiers are prepared for combat. In particular, soldiers must be "experts"

with their weapons. Weapons training time is scarce in most CSS units. Demand time for weapons training. Experience in Panama showed that soldiers need more weapons training under greater stress. In combat your soldiers will fire their weapons when they are often scared or out of breath. Simulate this in your training. Cross-train personnel on your machine guns as well. Leaders must continue to train drivers to operate at night. In Panama convoys traveled during day and night. Convoys traveled roads with street lights and then turned onto a street without lights. Driver's night training should include the use of night observation devices (NODs), but not be dependent on them. In many areas of Panama City there was too much light which washed the NODs out.

Conclusion

We are all familiar with the term "train as you would fight." Operation Just Cause justifies this saying. Many units performed in an exemplary manner. Other units repeated the same mistakes made in previous conflicts. As a result, soldiers literally paid for this with their blood. Read and learn from this and other papers on lessons learned. Incorporate these lessons into your training. If they seem like common sense to you, good! Do not assume that everyone knows how to do it. As logisticians we have a thankless but vitally important job. Mission success depends upon supplies reaching the combat units.



Ruins of Panama Defense Force station in Panama City during Operation Just Cause

CPT Robert J. Gaddis was Executive Officer, C Company, 5-87 Infantry during Operation Just Cause. A 1986 graduate of Ohio State University and a graduate of the Infantry Officer Basic, Quartermaster Officer Advanced, Airborne, Ranger and Pathfinder Courses, he also served as a Rifle Platoon Leader and Support Platoon Leader, 5-87 Infantry, 193d Infantry Brigade (Light).

SUPPORT OPERATIONS PLANNING - A TECHNIQUE

CPT William E. Morris

Supporting a mechanized or armor brigade is a daunting challenge. Keeping 3,500-plus soldiers fed and over 400 vehicles fueled, armed and fixed requires minute attention to detail, flexibility and detailed planning. Of all the qualities of a logistician, the ability to plan in detail is most admired. Various Army manuals and publications detail the planning process and the "how to" of support. Invariably, local solutions to requirements make a good thing better. My goal here is to present one of those " nuts and bolts" solutions that can aid in the planning process.

The process of planning support begins with the receipt of the mission and guidance from higher headquarters. Logisticians go through an automatic thought process that eventually becomes second nature: What type of unit am I supporting? Where are they? What is their equipment density? Who gets priority of support? How much fuel do we need? Ammunition? Rations? Where does it come from? One question automatically leads to another. Figure 1 shows a list of some questions routinely asked in the support planning process. This wargaming and decision process ultimately finds its way onto a tactical logistics overlay.

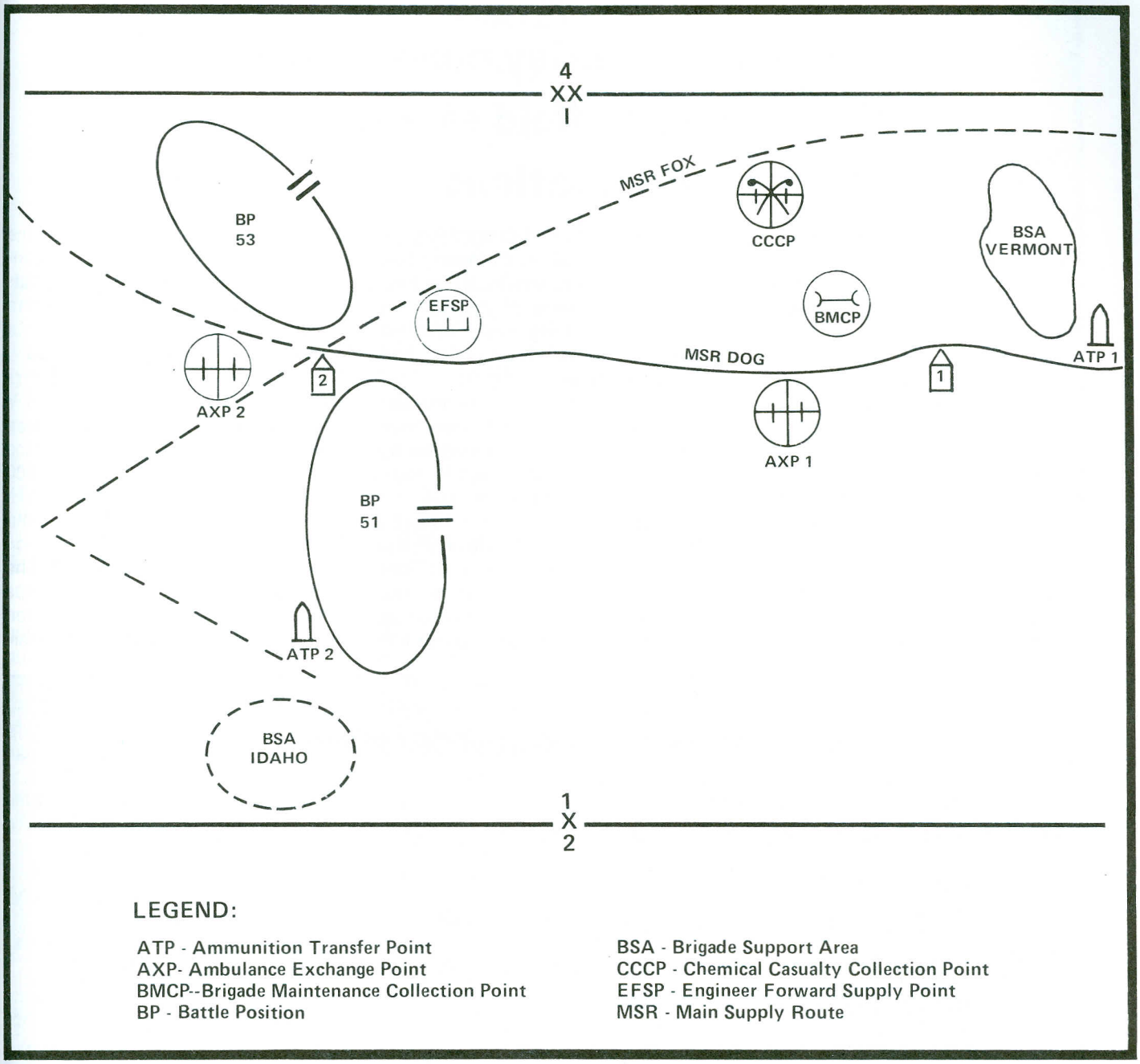
The logistics overlay can help drive the planning process. It is, in essence, a graphic depiction of the decision process and the written logistics order. Since 90 percent of the results of planning finds its way onto a logistics overlay, knowing what should be on an overlay can ensure that nothing is forgotten. The logistics overlay is probably even more important than the written order because it can be easily understood by all levels within the logistics community. A written order may be confusing to some who are unfamiliar with the support planning process, but a clear overlay is instantly intelligible to all. A good plan that is understood from top to bottom is better than an excellent plan understood only by a few key players. I want to emphasize that the actual process of making an overlay is not, and cannot, be divorced from the planning process or the written order. However, a poorly constructed overlay can mean negative consequences for future support operations.

The Army offers little specific guidance for developing tactical logistics overlays to support mechanized operations. This obviously has a negative impact on maneuver brigade S4s (Logistics Officers) and forward support battalion (FSB) support operations officers. Field Manual (FM) 101-5 (Staff Organization and Operations) concentrates on overlays for division and echelons above division, and FM 63-20 (Forward Support Battalion) only covers the flow of individual classes of supply. Without comprehensive guidance, most field units have written standard operating procedures to incorporate doctrine and cover local policies. This article suggests a method for creating such overlays, specifically for a mechanized infantry or armor brigade. With the Army moving toward brigade-size elements as the basic tactical building block, easy-to-understand overlays become especially important.

Before developing the logistical overlay, understanding of the tactical mission from higher headquarters and the commander's intent is vital. The brigade S4 is the key to developing the logistical overlay since he is most likely to be up-to-date on current and future operations. In all classes of supply, the decision-making process and considerations of mission, enemy, terrain, troops and time available (METT-T) should be incorporated into support operations planning. A starting point is to copy the maneuver boundary and phase line graphics (Figure 2). Copying these graphics first keys everyone to the maneuver plan and provides a common frame of reference. Depending upon the mission, the copier must understand the main axis and objectives (offense) or battle positions (defense). With this basic knowledge of the tactical situation, the planning for logistics can begin.

The location of the brigade support area (BSA) should be planned first. Before placing a "goose egg" for an overlay, the planner must consider the tenants within the BSA, METT-T and available road networks as well as what the BSA is capable of defending. A unit may already be located in the BSA or in a forward assembly area (FAA). If in an FAA, conduct a tactical road march to the new BSA. To select the new BSA site, work with the FSB S2/3 (Intelligence and Operations). The S2/3 should plan all tactical road marches and occupation of the BSA.

From the BSA, the main supply route (MSR) must be developed. If provided a logistical overlay from higher headquarters, the MSR may already be established. If not, select an appropriate route which can support logistical movement while still supporting the tactical maneuver. Once the MSR is established, alternates and "dirty" MSRs should be planned. A "dirty" MSR is one to use in case of nuclear, biological, chemical (NBC) contamination. The MSRs should include not only the immediate objectives of the brigade, but also extend beyond the initial objectives/battle positions. Additionally, MSRs may extend toward the rear of the brigade boundary (although this



Sample Logistics Overlay

requires coordination with higher headquarters). Contingency planning will allow for smooth operations during extended offensive or retrograde operations on short notice . When planning for MSRs, it is better to have and not want, than to want and not have. Establishing MSRs is the most critical part of developing the logistical overlay. This is because MSRs cannot be easily sent in fragmentary orders (FRAGOs) by radio. However, with all other graphics, more is not necessarily better. More graphics cloud the map and detract from a simple plan.

Assign tentative BSA locations to support the system of MSRs. The same criteria used for the initial BSA is necessary for these projected locations both forward and to the rear of current operations. Most support activities can be conducted within the BSA. The security of the BSA and the colocation of the supported units' field trains allow efficient supply flow. The key classes of supply using this supply point distribution are Class II (general supplies), packaged III (petroleum, oils and lubricants), VI (personal demand items), VIII (medical supplies) and IX (repair parts). Class VIII may also be backhauled through unit ambulances

A logistical overlay must support the fluid battlefield as a 'picture' of support operations.

during the battle. Class VII (major end items) is not normally kept on hand and must be resourced from division or corps. Because of METT-T considerations, going outside of the BSA to a predesignated logistics release point (LRP) may be necessary and desirable. This system works well when distributing Class I (rations), water and bulk III supplies. If using logistics release points (LRPs), plot several. For security reasons, do not continuously or repeatedly use one LRP. Also, vary LRP use to avoid contact with the enemy. Although tenant locations are plotted on the overlay, do not plot such locations as salvage points and Class II supply points. The FSB A Company has these missions, and logistics personnel are aware of this for the most part. Plotting these locations will only cloud the overlay and detract from simplicity.

Class IV (construction and barrier materiel) engineer forward supply points (EFSPs) are assigned by the brigade S3 and brigade engineer, in coordination with the brigade S4. Although he may not be directly involved with the EFSP, the FSB support operations officer should include the EFSP on the overlay as a quick reference to all. The EFSP is crucial as a single forward supply point in preparing the defense. The EFSP is normally centrally located at the rear of the battle position. Class IV delivery is on a throughput basis from the main support battalion (MSB) or corps.

Ammunition transfer points (ATPs) will be used for Class V (ammunition) distribution. These ATPs should be located outside the BSA, approximately 500 to 2,000 meters (depending on METT-T). Ammunition is normally delivered from corps through division on trailers dropped at the ATP. The prime mover then returns to corps for another mission. Ammunition on the ground presents a good tar-

KEY QUESTIONS THAT SUPPORT PLANNING

— Who are we supporting?

— What is their equipment mix and density?

— What is the task organization?

— Where are they now and where are they going?

— Where should we position ourselves? Does it provide protection? Does it support the tactical plan?

— Can we communicate from that location?

— Who has priority of support? Will priorities change?

— How much supply is required in fuel, rations, ammunition, water and barrier material?

— What assistance do we have from higher headquarters in aviation, transportation, back-up maintenance and medical support?

— DO WE HAVE ENOUGH OF EVERYTHING?

Figure 1.

STEPS IN DEVELOPING A LOGISTICAL OVERLAY

- Trace key tactical graphics (boundaries, objectives, phase lines).
- Project brigade support area (BSA) and tentative BSA locations.
- Develop main supply routes (MSRs), alternate and chemical MSRs.
- Plot points for key classes of supply (logistics release points (LRPs) for Class I (rations) and III (petroleum, oils and lubricants) and ammunition transfer points (ATPs) for Class V (Ammunition)).
- Plot ambulance exchange point (AXP) locations.
- Plot chemical casualty collection points (CCCPs).
- Plot maintenance collection points (if used).
- Cross-check against intelligence, engineer and fire support overlays.

Figure 2.

get to the enemy. Placing the ATP outside of the BSA reduces the danger but requires additional security measures. To avoid a long-term security obligation, unit trains must pick up ammunition in a timely manner. Usually one ATP is designated per BSA, but others may be added. Since corps trucks and trailers routinely stop at the ATP, an additional mission can be assigned. An ATP may become an alternate trash site, particularly in peacetime.

Maintenance flow is crucial to keeping the brigade combat forces forward. To do this, an option is to plot a brigade maintenance collection point (BMCP) staffed by the FSB maintenance company. Though not doctrine, this concept is available for use with advantages and disadvantages. Historically, once a vehicle reaches the BSA, it is out of action for longer than necessary. A possible solution is establishing a BMCP forward of the BSA. The BMCP would not only be a more forward fix, but would also keep priority vehicles in the limelight.

Ambulance exchange points (AXPs) are established along the MSR to quickly move casualties to the rear. Near the AXPs (but not colocated) are chemical casualty collection points (CCCPs). Off the MSR, these CCCPs would go "hot" only when necessary. Graves Registration (GRREG) operations would be supported by the concurrent return program. Deceased personnel are evacuated to the GRREG collection point, normally near the ATP. This allows transportation of deceased personnel as backhaul on Class V vehicles. NBC casualties killed in action would be temporarily interred at the CCCP site if possible. The site is marked with the appropriate NBC warning and set up by GRREG procedures.

The logistical overlay must support the fluid battlefield. Various sites will be activated, depending on the progress of the battle. Knowing which sites are "hot" is crucial and must go hand-in-hand with the tactical plan. The overlay must also be cross-checked with the intelligence, engineer and fire support overlays. The reason is to avoid placing key logistical operations in harm's way. For example, a logistician would not locate the BSA on what the brigade S2 has indicated as the enemy's main avenue of approach.

The logistical overlay production process can be adjusted to suit a light/heavy mix or light forces. The principles remain the same. The overall goal of the overlay is to provide the most information possible with the least amount of ink. This "picture" of planned support operations will then truly be worth a thousand words.

CPT William E. Morris is a graduate of Rollins College, Winter Park, Florida. A graduate of the U.S. Army Officer Candidate School, Armor Officer Basic and Quartermaster Officer Advanced Courses, he has served as a Tank Platoon Leader, Battalion Scout Platoon Leader and Battalion Support Platoon Leader with 2-34 Armor, 1st Infantry Division (Mechanized) Fort Riley, Kansas. He is currently assigned to the 10th Mountain Division (Light Infantry), Fort Drum, New York.

COMBAT SERVICE SUPPORT - THE CRITICAL LINK

CPT James E. Davis, Jr. *LT David M. Hammons*

As the U.S. Army develops and fields its training centers, such as the National Training Center (NTC) at Fort Irwin, CA, the Joint Readiness Training Center (JRTC) at Fort Chaffee, AR, and the Combat Maneuver Training Center (CMTC) at Hohenfels, Germany, combat service support (CSS) units are going to become the critical link in this fast-paced training. The emphasis on timely and efficient support to maneuver brigades will be a key to victory on the battlefield. C Company, 407th Supply and Transport (S&T) Battalion of the 82d Airborne Division, Fort Bragg, NC, had the opportunity to train at both the NTC and JRTC in the course of a four-month period, an opportunity few CSS units ever have. Some of the observations, comparisons and recommendations gleaned from back-to-back rotations may be helpful to CSS units deploying in the future.

C Company, 407th S&T Battalion is an airborne forward supply company with the mission to provide Class I (rations), II (general supplies), III (petroleum, oils and lubricants), IV (construction and barrier materiel), V (ammunition), and VII (major end items) supplies, graves registration (GRREG) and water support to the 505th Parachute Infantry Regiment of the 82d Airborne Division. This diverse supply company consists of 56 paratroopers in a headquarters section and a supply platoon. The headquarters section consists of a command element, a GRREG noncommissioned officer (NCO), food service specialists and a Tactical Army CSS Computer System (TACCS) operator. The supply platoon consists of a Class I, II, III, IV, VII section, a Class V section and a maintenance section. Although there are few airborne forward supply companies in the Army, the lessons learned are universal.

Preparation

During November and December 1988, a "light" package from the supply platoon deployed to the NTC as a part of a light/heavy task force made up of the 1st Brigade, 24th Infantry Division, and the 1st Battalion, 505th Parachute Infantry Regiment, 82d Airborne Division. These units completed two train-up exercises, including an external evaluation at Fort Stewart, GA, before deploying for the NTC. The main focus of home station training was to establish procedures and a working relationship with the 24th Forward Support Battalion (FSB). We also sought to identify any potential logistical problems that would hamper CSS for a heavy/light task force. The effort paid off. The major issue identified was a duplication of effort between C/407th and the 24th FSB in drawing Classes I, IV and V. We decided early that the 24th FSB would draw all classes of supply (for the light task force) except Class III and that C/407th would become a customer of the 24th FSB for all other classes of supply. This streamlined supply support and also more efficiently used available personnel and assets. C/407th augmented the 24th FSB with personnel in Classes I, IV, V and GRREG to increase the depth and efficiency of these operations.

Company-level training at home station focused on soldier survival skills. Soldiers trained on preparing fighting positions; emplacing crew-served weapons; calling for fire; range cards; enemy aircraft/vehicle identification; sending reports by the SALUTE (size, activity, location, uniform/unit, time and equipment) method; communications; movement and patrolling techniques; navigation; nuclear, biological and chemical (NBC) warfare; giving first/buddy aid and reacting to indirect fire. Company-level collective training focused on mission support skills such as conducting night convoy, displacing and reestablishing of support, sling loading operations and training the brigade support area (BSA) reaction force.

Deployment

Rail load operations for NTC began two weeks before the advance party deployed. Above all, a successful rail load operation requires personnel proficient in the mechanics of the operation. All the planning is useless if soldiers need on-the-job training for rail load operations. The movement control center (MCC) of the 1st Corps Support Command (COSCOM) instructed all drivers and assistant drivers. The classes taught rigging secondary loads on vehicles and also actual practice loading and tying down vehicles. After classes on lashing, blocking and bracing container express (CONEX) containers, loading dangerous cargo and measuring the center of gravity for vehicles and loads,

soldiers began the "hands-on" portion of actual practice. The following are the most important things a unit can do to guarantee a smooth operation:

- Ensure soldiers have the right equipment.
- Ensure vehicles are not overloaded or underloaded.
- Train the soldiers.

The supply platoon deployed to California in two phases: (I) an advance party who off-loaded the rail cars and (2) the rest of the company who jumped into the desert at the start of the exercise.That same night, C Company had its first taste of the desert during a night convoy to the BSA. Night convoys are doubly difficult in the desert due to the lack of terrain features, the dust and the great distances. Frequent traffic control points, a good system of route marking, maximum use of night vision devices and advance planning are essential to successful convoys.

The NTC

Soon after arriving at the BSA site, opposing forces (OPFOR) F-I6 jets strafed the area, caused several casualties and destroyed a fuel truck. Personnel and equipment destroyed either by Multiple Integrated Laser Engagement System (MILES) equipment or by an observer/controller in the NTC scenario are taken out of the exercise for 24 hours and held until reports requesting replacements make their way through the personnel system. Other characteristics of this type of warfare are frequent chemical and artillery attacks and a mechanized threat to the BSA. The best way to counter these threats is to conduct intensive NBC training before deployment, build thick sandbagged bunkers and fighting positions in the area, totally camouflage equipment and use listening posts/observation posts (LPs/OPs) as well as training on how to call for fire.

Despite dealing with the high-intensity scenario, C Company also managed to provide responsive Class I, II and III support, give GRREG support and operate a field dining facility. Over 38,000 meals were handled by the Class I section which drew rations from the 24th FSB and issued to Task Force I/505 on a daily basis by pushing logistics packages (LOGPACs) forward to maneuver units. Limited Class II items were distributed on a direct exchange basis.TheClass III section issued I2,365 gallons of bulk fuel from its tank and pump unit and forward area refueling equipment (FARE) systems and provided seven lines of Class III packaged products to Task Force I/505.

The GRREG NCO processed 44 remains in cooperation with the 24th FSB's GRREG collection point. Class IV, V, and water and transportation support to Task Force I/505 was coordinated through the Forward Area Support Coordination Officer (FASCO) and provided by the 24th FSB. NTC is a transportation-intensive environment, especially for light forces, and transportation assets must be closely managed. NTC is also very maintenance-intensive, requiring vehicle operators to perform regular preventive maintenance checks and services (PMCS). Clogged fuel and air filters and damage to vehicles from rough terrain are the most common problems. Here, leader involvement in maintenance is critical.

Throughout the rotation, observer/controllers from NTC hold after action reviews (AARs) to brief units on their strengths and weaknesses and to discuss the best ways to provide CSS. The AARs are multimedia briefings that use videotapes, photographs and computer graphics to illustrate how to improve logistical support.

After completing the field portion of the exercise, C Company moved back into Fort Irwin, CA, loaded equipment onto the rail cars and prepared to redeploy to Fort Bragg, NC. They moved in two phases: an airland at Pope Air Force Base, NC, and a tactical parachute jump back into Fort Bragg.

The JRTC

Immediately upon return from this successful NTC rotation, planning began for a rotation to the JRTC at Fort Chaffee, AR. After a Christmas holiday, soldiers returned to the field for training in January and February as the pace intensified for JRTC. This training, which included providing CSS to a battalion external evaluation (EXEVAL), focused on sharpening critical soldier skills while training as a "slice" element of Task Force, 2d Battalion, 505th Parachute Infantry Regiment, and heavy elements of the 194th Armored Brigade. The goal was to enhance survival on the battlefield of today and to strengthen the supply support relationship between supported units and C Company. As noted during training for the NTC, support was again streamlined to more efficiently use personnel and assets. Support elements of the 194th Armored Brigade deployed with maintenance and fuel assets and received all other logistical support from C Company.

Home station training for JRTC focused on the soldier skills noted as weaknesses during the NTC rotation and continued to build on those noted as strengths. Here is where the NTC

"take-home" package is helpful. The take-home package basically consists of the AAR for the entire rotation. It includes video tapes as well as a complete summary of each battle, analyzed using the battlefield operating systems. This package is ideal for use in developing a training plan after the unit's return to home station.

The month of March arrived with deployment preparation for JRTC in full swing. Frequent meetings with the FASCO and the brigade 54 (Supply Officer) ensured that providing critical CSS was an integral part of the tactical plan. Again, coordination between supporting and supported units is vital. Just as with NTC, rail load operations were planned and executed to deploy all unit equipment. The unit itself deployed in three phases: (I) The advance party, (2) the airfield departure arrival control group (ADACG) and (3) the main body. Advance party operations were critical to off-loading the rail cars and coordinating "host nation" (JRTC) support. An Emergency Deployment Readiness Exercise (EDRE) was initiated to alert and marshal the unit before deployment. All personnel had to process for overseas movement (POM) and draw MILES equipment before departing Fort Bragg.

The ADACG or Alpha Echelon, which consisted of I0 soldiers, parachuted with the initial assault to guide Air Force C-I30 aircraft during the airland phase and to establish accountability of all personnel and equipment during both actual and notional airland. Due to the poor condition of the flight landing strip (FLS), all personnel were notionally airlanded. The main body was an element of this notional airland. Then the unit conducted a two-mile tactical road march with 40- to 50-pound rucksacks to the drop zone for linkup with equipment. The 40-pound rucksacks contained rations for one day and a change of clothes including cold weather gear, ammunition, water and sleeping gear. Soldiers were prepared to sustain if linkup did not occur. The tactical road march reinforced the fact that primary transportation for all units is by foot until vehicles become available. CSS units need to conduct tactical road marches at home, and physical fitness is a must.

The unit displaced to the BSA under the cover of darkness. At the BSA the unit engaged and subdued a small guerrilla force. This is characteristic of the low- to mid-intensity JRTC scenario. The primary threats in this scenario were small, dismounted patrols whose goals were to disrupt CSS and enemy helicopter air attacks.

The threat of chemical and artillery attacks also existed but much more infrequently than in the NTC high-intensity scenario. The best defense depends on basic soldier skills, a good barrier plan and small unit air defense drills. To further counter the threat, all command posts (CPs) in the BSA were dug in by engineers, placed below ground level and camouflaged to prevent them from becoming easy targets for the OPFOR. The BSA's entire perimeter was enclosed by triple strand concertina wire with mine fields and other barriers emplaced to prevent easy access. This elaborate barrier plan prevented the BSA from being quickly penetrated by the enemy and also reinforced the ability to detect infiltrators quickly with night vision devices.

Although the threat level was lower than at the NTC, CSS was challenging because all supplies had to be picked up from the host nation (JRTC) instead of being pushed forward from the division support area (DSA) or throughput from corps as doctrine dictates. The vehicles that provided supplies and transported soldiers were required to have crew-served weapons mounted on them for security while traveling the main supply route (MSR).

Vehicles without crew-served weapons were easy targets for OPFOR patrols. Class I was drawn from JRTC Troop Issue Subsistence Activity (TISA) using a 40-foot stake and platform (S&P) trailer which was kept uploaded to maintain mobility. Perishable Class I supplies and supplements were stored in a general purpose (GP) medium tent to prevent contamination from a chemical attack. The Class I section issued 5I,420 T-Rations and Meals, Ready-to-Eat (MRE) to support the 1,800-soldier task force. Class II direct exchange (DX) items were taken to support the task force to replace lost or damaged equipment. The Class III point operated from a 40-foot S&P trailer which was uploaded with 500-gallon collapsible fuel drums and a tank and pump unit. In this manner, 30,000 gallons of bulk fuel and nine lines of Class III packaged products were issued. Class II personnel also issued water from 500-gallon collapsible drums because the task force commander decided against using the Reverse Osmosis Water Purification Unit (ROWPU). By not deploying the ROWPU, the Class III section had to simultaneously issue fuel and water without the ROWPU personnel as a backup (as per standing operating procedure). This placed greater demands on already critical transportation assets to haul water to the BSA for distribution. The additional traffic created by

hauling water into the BSA caused a transportation bottleneck and increased the signature of the BSA. Class IV was issued in the form of 95 preconfigured packages of barrier material. The Class V section operated a "mini" field ammunition supply point (ASP) instead of an ammunition transfer point (ATP) as doctrine specifies. The ammunition was drawn from the ammunition holding area and transported to the ASP where it was downloaded. This limited the unit's mobility and made a target for the OPFOR. During the exercise, 42,706 rounds of small arms ammunition and 5,334 rounds of tank and artillery ammunition (both live and simulated rounds in fiber boxes) as well as missiles and pyrotechnics were issued to support the task force.

Other support included GRREG, which processed 602 remains. Because of this high volume of casualties, two additional GRREG personnel from Ist Corps Support Command augmented C Company. Transportation augmentation in the form of l0 each, 2 l/2-ton trucks and operators from D Company, 407th Supply and Transport Battalion worked around the clock, driving 6,811 miles in support of Task Force 2/505. Transportation assets became a crucial element, moving the task force around the battlefield and picking up essential supplies to support the battle. All transportation requests were carefully checked to ensure that transportation assets were not being misused. Observers/controllers also led discussion in AARs similar to those at NTC.

Both NTC and JRTC provide some of the most realistic training a unit will experience. The NTC high- to mid-intensity environment is characterized by constant artillery attacks, heavy NBC "'play" attacks by helicopter and jet aircraft, long lines of communication and high fuel, water and ammunition consumption rates. The NTC is very definitely a transportation-intensive environment, which presents a significant challenge for a light unit. By contrast, the JRTC low-intensity environment is characterized by small dismounted patrols attempting to ambush convoys and penetrate the BSA, limited helicopter attacks on the BSA and limited NBC attacks. But fuel, water, ammunition and transportation demands are similar to those found at the NTC. In either training area, both light and heavy CSS units must be highly trained in basic combat skills and be able to defend themselves and protect supplies. Successful mission accomplishment by maneuver units depends on the timely and efficient delivery of essential supplies by CSS units.

CPT James E. Davis, Jr. is a Forward Support Battalion Observer/Controller at the Combat Maneuver Training Center, Hohenfels, Germany. A Distinguished Military Graduate of the University of Central Florida at Orlando, he is also a graduate of the Quartermaster Officer Basic, Quartermaster Officer Advanced, Airborne, Aerial Delivery and Materiel Officer and Jumpmaster Courses. Most recently, he was Commander, C Company, 407th Supply and Transport Battalion, Fort Bragg, North Carolina.

LT David M. Hammons is a graduate of Texas A&M University at College Station. He is a graduate of the Quartermaster Officer Basic, Airborne and Jumpmaster Courses. Currently assigned as Petroleum Platoon Leader, Headquarters and Service Company, 407th Supply and Transport (S&T) Battalion, Fort Bragg, North Carolina, he was the Supply Platoon Leader/Executive Officer of C Company, 407th S&T Battalion.

Combat Service Support (CSS) Lessons Learned

- CSS units must know the tactical mission, follow-on mission and the CSS plan of the task force. This allows the CSS unit to anticipate requirements instead of reacting to them.
- CSS units must know the current status of main supply routes (MSRs) and alternate supply routes (ASRs). This keeps critical transportation assets out of harm's way.
- There must be a way within CSS units to verify mission support execution/completion. This allows efficient management of limited assets.
- The perimeter defense plan of the brigade support area (BSA) must incorporate all tenants.
- Sleep plans, not a luxury, are essential and must be enforced for all from the lowest to the highest level.
- Listening posts/observation posts (LPs/OPs) must be emplaced. The large size of the BSA requires an early warning force. Well-trained LPs/OPs act in an economy-of-force role, by allowing CSS commanders to free up personnel for the support mission instead of tying down a large BSA reaction force.
- Intelligence information must be passed to units in the BSA quickly.
- Driver training in limited visibility is essential since most CSS operations will occur during darkness or adverse weather.
- Communications must be established with all in the rear area. This makes information and intelligence flow easier.

LEADERSHIP COUNSELING

CPT John M. Paul

A quality counseling program is critical for a unit's success in today's Army. In the 1990s leaders will be required to do more with less as a result of armed forces cut-backs. We will need to get the very most out of every soldier. Every soldier will have to understand the unit's goals and objectives. It will be critical to synchronize and direct our limited assets toward mission accomplishment. Counseling will be more important than ever.

Three main areas will help leaders improve their counseling programs. First, leaders need to give clear guidance to their counselors about what is expected from the counseling program. Second, commanders need to continually check first-line supervisors to ensure soldiers are receiving quality counseling. Third, leaders need to be aware of a negative perception of counseling in the Army that has led to a reluctance to counsel.

WHY COUNSEL?

Counseling is a basic responsibility of every leader and an important part of caring for our soldiers. The Army counseling manual states it is an absolute requirement that leaders regularly counsel their soldiers. The aim of counseling is to develop the soldier, improve his well-being and solve his problems. For us to be effective counselors, we must lead by example and be technically and tactically proficient. We must have a genuine concern for our soldiers.

A unit's counseling program should provide leadership that directs, implements and motivates. All soldiers, regardless of rank, deserve feedback on how they are doing. A counseling of a subordinate should:

- Praise good performance.
- Tell the soldier what he is doing well and what he is doing poorly.
- Assist the soldier in achieving the desired standards.
- Cause the soldier to set personal and professional goals.
- Help the soldier resolve personal problems.
- Make the soldier understand how the organization's goals relate to him as an individual.

All of us need to be coaches, trainers and teachers. Counseling is one of the principal tools by which we mold and develop our soldiers. A leader who fails to counsel is negligent in performance of duty.

YOUR COUNSELING PROGRAM

A counseling program must meet the needs of the unit. The commander must decide what he wants his counseling program to accomplish. He must then get his policy to his counselors and enforce it. Clear written guidance to your subordinates is very helpful. A policy letter or standing operating procedure (SOP) is a method for setting the tone for counseling in your unit. Your soldiers need to know the standards you expect of them. Your counseling program will help the unit achieve its missions by communicating these standards to the soldiers.

Here are some points you should address when setting up your unit's counseling program:

- Who is going to counsel whom?
- When is counseling going to be conducted? Counseling is important — are you allocating time for it on the training schedule?
- Who checks counseling and how often? Is your counseling program a "slug stopper" or is it really helping improve your soldier's performance?
- Do your first-line supervisors have the communicative skills to make the counseling program work? Do you need to spend some extra time developing your junior leaders as counselors ?
- Are your soldiers being told what is expected of them and what they need to get promoted?
- Are your priorities and goals being communicated to your soldiers?
- Is all counseling getting documented?
- Who is going to keep counseling packets? Are they secure?

The commander needs to make the counseling program work for his unit.

YOUR FIRST-LINE SUPERVISORS

A leader must continually check the quality of counseling his soldiers are receiving. All your subordinate leaders will have had some formal counseling training. Counseling techniques are taught in most Army leadership schools. Do not, however, assume all your subordinate leaders are good counselors. Many of your subordinate leaders will have come from units where counseling is not a high priority. Their counseling ability probably will not be up to the standard you expect.

In many units counseling is done but it is a "check the block" exercise. This type of counseling

will not achieve your objectives. It is not constructive counseling. It is only done to satisfy the minimum regulation that requires all soldiers to receive counseling. It is a "slug-stopper" program. It only tells a soldier to keep up the good work. It accomplishes nothing for the unit or the soldier. Continually check your first-line supervisors and ensure your soldiers are receiving quality counseling. Ensure they are getting explicit guidance. Spell out for your soldiers what you want. For example: "You shot a 34 with your M16A2 rifle on the range this month. I am impressed with your progress. This is a big improvement over the 24 you shot last month. I want you to shoot expert, 36 or above. I know you can achieve this and the extra promotion points will help you make sergeant. I want the entire section to shoot expert. The younger soldiers in the section really look up to you. You can help me achieve this goal. Keep up the good work."

That example of counseling is performance-oriented. It will lead to your unit achieving your goals. Some items I feel should be on every soldier's counseling statement each month are the Skill Qualification Test (SQT) score, Army Physical Fitness Test (APFT) score and weapons qualification score. These directly affect a soldier's ability to get promoted from specialist to sergeant and from sergeant to staff sergeant. The soldier needs to know that he has control over these promotion points. This is one way that a counseling program can develop and take care of our soldiers. Counseling is the commander's program, but it is for the soldiers.

Counseling is an important skill. It is part of being technically proficient as a leader. You need to continually develop your junior leaders as counselors. This can be done in a training exercise through role-playing or by on-the-job experience. Your Junior leaders will become better counselors as they gain confidence. Take the time to train them. Your efforts will pay off.

COUNSELING-THE NEGATIVE PERCEPTION

There is a perception throughout the Army that counseling is a negative process. We feel mentoring is good but counseling is bad. We feel that counseling is only meant for soldiers who are clearly not meeting the standards. This is obviously not what the Army counseling program was designed to achieve. This negative perception leads to a reluctance to counsel.

Counseling is part of the communication system in a unit. This system strengthens the links in the chain-of-command. Communication allows a unit to accomplish its missions. All soldiers, especially those in leadership positions, need periodic counseling. Do not have your soldiers sitting around wondering how they are doing. This will happen when their supervisor has not counseled

them in a while.

A leader I respect once told a group of officers:

"I know everyone in this room does the best job they can every day. Most people fail because of one of two reasons: either they did not know how to do something or they did not know they were responsible for doing it. This is where counseling comes in."

We need to erase the idea that counseling is something negative.

One example of this negative perception is the junior lieutenant's reluctance to counsel his platoon sergeant. Some junior leaders feel a reluctance to counsel because the subordinate has more time in the unit and in the Army than they do. When counseling does not occur, priorities, goals and duties are not agreed upon. Counseling is not only the discussion of shortcomings.

The new Noncommissioned Officer Evaluation Report (NCOER) program is doing much to improve counseling that our noncommissioned officers (NCOs) receive. This program forces the rater to counsel the rated NCO at least quarterly. The rater and rated NCO are required to sit down within the first 30 days and discuss duties and responsibilities. An inexperienced lieutenant must remember his platoon sergeant may work for as many as 20 different platoon leaders during his service. Each officer has a different set of priorities, values and criteria for judging the success of that NCO. Do not make him guess what you expect from him. Tell him up front. Tell your subordinates how they are performing. Tell them often. Do not save up for an efficiency report.

APPROACHES TO COUNSELING

FM 22-101 (Leadership Counseling) contains three approaches to military counseling. These are directive, nondirective and the combined approach. Chapter 2 details the advantages and disadvantages of each method. If you can make the time, I would suggest a participatory approach. Before your next counseling session, make your subordinates do a thorough self-analysis. Have them write down and bring the following to your counseling session:

- Three things I do well.
- Three things I do not do well.
- How I will fix the things I do not do well.
- My goals and objectives (personal and military).

A leader must be able to analyze his own strengths and weaknesses to be an effective counselor. All of us need goals in our careers and personal lives.

A soldier needs to come away from counseling with an understanding of what he needs to improve.

He needs to understand the paths to achieve this improvement. Explore these avenues together. Performance counseling should not be one-sided. Give this approach a try the next time you counsel one of your leaders.

LEADERS MUST SEEK COUNSELING

Leaders share the responsibility to ensure they receive formal counseling. Do not wait until an efficiency report is due to see how your raters view your performance. If your raters have not counseled you in awhile, approach them. This does not have to be in the office. You can discuss your job performance anywhere. Approach your boss at the officer's club or during a morning fitness run if you feel more comfortable. Where counseling takes place is immaterial. It is important that you receive feedback on your job performance. You need to know how superiors view your performance.

All of a unit's efforts must be directed toward the priority missions.

CONCLUSION

Counseling is critical for a unit's success. It is something leaders at all levels must be intimately involved with. Counseling is for the soldier but it is a commander's tool. It communicates the unit's goals to the individual soldier. It allows him to see how his performance directly impacts on the unit's ability to accomplish its missions. Counseling is communication. It gets all soldiers working toward common goals set by the commander.

A commander must establish a counseling program in his unit. This program should be tailored to that unit's particular mission and objectives. A commander must continually check to ensure that soldiers receive quality counseling. Leaders at all levels need to help rid counseling of its negative image.

Counseling is a good indicator of the quality of leadership in a unit. Developing a quality counseling program in a unit takes time and effort, but the energy you put into it will be well worth it.

CPT John M. Paul is a graduate of the Officer Candidate School, Fort Benning, Georgia. He also is a graduate of the Infantry Officer Basic, Quartermaster Officer Advanced, Airborne and Petroleum Officer Courses. He has served as a Platoon Leader and Company Executive Officer with 9th Infantry Division, Fort Lewis, Washington.

SHOULD WE RETAIN THE ACADEMY?

CSM Bobby L. Casto

Should we retain our Noncommissioned Officer (NCO) Academies? Maybe the question should be restated. What happens if we do not have NCO Academies? The answer is not pleasant. To get an answer to that question we need to look at *why* our NCO Academies developed. After World War II the Army quickly reduced itself from an end strength of 8 million in 1945 to less than 325,000 by 1950. Many of those departing the Army were veteran NCOs. Most of the NCOs who remained on active duty were very junior and largely untrained in the responsibilities of an NCO.

The end result was that many senior and mid-level enlisted soldiers with no troop-leading experience remained. Company grade officers quickly became accustomed to taking over many of the NCO's duties because of this inexperience in the NCO corps. General Bruce C. Clarke recognized the problem and established the first NCO Academy in December 1949. Its goal was to "...develop within the noncommissioned officer an ability to recognize his responsibilities and a willingness to assume responsibilities; the confidence needed to apply the knowledge he possessed; leadership techniques; and high personal and professional standards." The academies produced NCOs that were more capable of performing in combat. The NCO who emerged from the Korean War was more prominently a battle leader than he had been in World War II.

Although NCO Academies increased in number from 1949 until 1965, not many changes occurred.

During the Vietnam Conflict, the Army again found the need for a large number of junior leaders. The Noncommissioned Officer Candidate Course produced sergeants and staff sergeants in 10 weeks. Some performed well, but most did not. In 1971 the Army realized the need for standardization and a progressive series of schools for all NCOs. The current Noncommissioned Officer Education System (NCOES) was established to place emphasis on training our NCO corps. Education is now linked to promotion. The Primary Leadership Development Course (PLDC) is required for promotion to staff sergeant, the Basic Noncommissioned Officer Course (BNCOC) for promotion to sergeant first class, the Advanced Noncommissioned Officer Course (ANCOC) for promotion to master sergeant and the U.S. Army Sergeants Major Academy for promotion to command sergeant major.

The value added by our NCO Academies is real. The Quartermaster NCO Academy ensures that Quartermaster NCOs remain competitive for promotion and develop confidence in their leadership ability. More importantly, we breed a sense of pride and duty in the NCO. When NCOs leave our doors they know the responsibilities of the NCO and are fully prepared to carry them out. We cannot go back to the "bad old days" when company grade officers performed those tasks historically entrusted to the NCO Corps. We need to learn from the past and not return to a system that produced "noncommissioned officers" in 10 weeks. We now have in place a system that develops quality NCOs fully able to support the force. The investment in the future is paying off. Should we retain our NCO Academies? Yes.

CSM Bobby L. Casto is the Commandant, Quartermaster Noncommissioned Officer Academy, U.S. Army Quartermaster Center and School, Fort Lee, Virginia.

QUARTERMASTER NCO ACADEMY QUESTIONS AND ANSWERS

We get a lot of basic questions here at the Quartermaster Noncommissioned Officer (NCO) Academy. I hope to answer some of the basics here. Remember, that **we** do not make selections for academy attendance, so do not call the academy to get a quota. But any other questions can be directed to our cadre. The DSN prefix at Fort Lee is 687-XXXX, Commercial (804) 734-XXXX. For ANCOC: 1SG Glen Milligan or SFC William Frey at 1240/2430. For BNCOC: 1SG Derek Braswell or SFC Nathaniel Grandberry at 2487. NCO Academy Operations: SFC Joseph Mason or SFC Debbie Henry at 2139/3738.

How is the course set up?

Both ANCOC and BNCOC courses are taught in two phases. Phase I covers the "common core" subjects such as leadership, drill and ceremonies, training management and other basic soldier skills. Phase II covers the technical aspects of the student's military occupational specialty (MOS). It reinforces previous training, provides a forum for lessons learned, as well as the latest information and innovations in the Quartermaster field, whatever the MOS.

How can I get selected for ANCOC?

A centralized Department of the Army board selects students for ANCOC. This board meets once a year. Promotions selection are also made at the same time this board selects soldiers for ANCOC.

How can I get selected for BNCOC?

The U.S. Total Army Personnel Command (PERSCOM) selects and schedules personnel to attend BNCOC. Unit commanders receive a candidate list based on guidance received by the soldier's major command. The list shows personnel tentatively scheduled to attend BNCOC. The list also shows proposed class dates for the soldier. The class dates are six to nine months out. Lastly, the list shows personnel who may be substituted for the primary candidate.

How long are the courses?

It varies according to the MOS. We handle 11 different Quartermaster MOSs with an average course length of 7 weeks, 6 days for BNCOC and 8 weeks for ANCOC.

Do we go to the field?

Yes. There is a five-day field training exercise (FTX) that all students execute. You will be assigned to a section and perform in different roles during the FTX. (See "Leaders and Training," *Quartermaster Professional Bulletin*, Winter 1990 for a discussion of the FTX.)

What about physical training (PT)?

A record PT test is given in the first week of the course. You will retest two weeks before graduation if you fail the first test. PT is conducted five days a week. Speed runs, conditioning runs and aerobics form the core of the program. A "special population" program is in effect for those requiring it.

What about the weight control program?

We enforce it completely. Don't bother coming to the NCO Academy if you are overweight. Better to get a deferment and lose the weight than have us send you straight back to your unit.

Will I live in the billets?

The academy has billets and a dining facility. If we are full, arrangements will be made to move some of the students off-post to local hotels.

CATS ON THE HORIZON

CPT Eddie B. Williams

Training is the Army's top priority; it prepares us to fight. As leaders, our sacred responsibility is to ensure that no soldier ever dies in combat because that soldier was not properly trained. Training prepares soldiers, leaders and units to fight and win in war -- the Army's basic mission.

—Foreword, FM 25-101

The Combined Arms Training Strategy— CATS — is on the horizon. The Army recognized the need for a strategy to identify the force's training requirements and also the development, acquisition and management of the necessary resources. To meet this goal, the Army developed CATS. CATS provides guidance on how the force trains and guidance on how the mix of training resources (ammunition, operating tempo, ranges, maneuver areas, combat training centers, training aids, devices, simulators and simulations (TADSS)) will be used to train combat-ready forces. CATS ensures training integration of heavy, light and special operations forces (SOF) of the Active and Reserve Components. This is different from the traditional mix of infantry, armor, field artillery and other combat support/combat service support units. CATS is developed with major Army commands (MACOM), commanders in chief (CINCs), the Army National Guard and the U.S. Army Reserve.

CATS provides guidance on training the force to standard and defines the requirements and resources for such training. It also clarifies the relationship between institutional training and unit training and describes training events, their frequency and required resources. CATS uses the principles in FM 25-100 (Training the Force) and FM 25-101 (Battle Focused Training).

The U.S. Army Quartermaster Center and School, Fort Lee, VA, developed a unit CATS for Active and Reserve Component Quartermaster units that includes maneuver, gunnery and soldier baseline strategies. The maneuver strategy, an annual plan, identifies—

- The base vehicle or equipment requiring the most fuel or repair parts.
- Training events, recommended frequencies and echelons for training.
- Critical gates (prerequisite training) and operating tempo.
- TADSS.
- Training land and training ranges.

The gunnery strategy includes the annual training plan for ammunition and pyrotechnics to support weapons training.

CATS describes the methods for training soldiers individually and collectively to specific military functions and tasks. The soldier training strategy, an annual plan, identifies—

- The career management fields (CMFs) in the unit.
- Training events and frequencies.
- Critical gates and TADSS.

It is not likely that Quartermaster units will have the exact resources—such as TADSS, ammunition, training land and training ranges—for carrying out the strategy as written. The commander will determine how to meet the standard. By linking training frequencies and required resources to training events, CATS will compare training resources to battle-focused training standard.

Standards remain constant; so any change in resources will have an associated impact on training. CATS will allow Army leadership to make informed judgements on resources and, when necessary, to make trade-offs. CATS will show—

- What the Army needs.
- When the Army needs it (for example, for situational training exercise (STX), command field exercise (CFX) or field training exercise (FTX)).
- What the impact will be if the needs are not met.

When fully implemented, CATS will mold present and future Army training. Quartermaster-proponent units must participate in the development and implementation of CATS as the Army moves into the 21st Century. There will be budget cuts, and the Army must be better prepared to justify the requirements for training resources.

During March and April 1991, the U.S. Army Training and Doctrine Command (TRADOC) fielded preliminary draft strategies to commanders of selected Active and Reserve Component units. This introduced the commanders to CATS and offered them a chance to provide feedback. Support from the chain of command was needed to ensure CATS received a prompt, thorough review. The implementation and ultimate success of CATS depends on unit commanders who will support it. Point of contact for CATS at the U.S. Army Quartermaster Center and School is CPT Eddie Williams, DSN 687-3440 or Commercial (804)734-3440/3711.

CPT Eddie B. Williams is the Senior Project Officer, Collective Training Branch, Directorate of Training and Doctrine, U.S. Army Quartermaster Center and School, Fort Lee, Virginia. A graduate of the Infantry Officer Basic, Infantry Officer Advanced, Combined Arms and Service Staff School, and Supply and Service Management Courses, he has served as a Rifle Platoon Leader, Assistant S3, Detachment Commander, Regiment S4 and, most recently, as Operations/Executive Officer of the Maintenance Division, 29th Infantry Regiment, Fort Benning, Georgia.

PARACHUTE RIGGER SAFETY

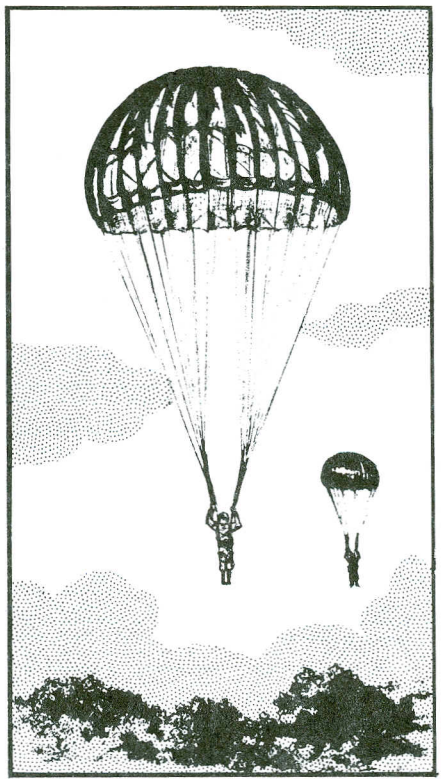
CW4 David P. Blacka *CPT Randy H. Butler*

Accidents and safety violations are a constant concern in the parachute rigger field. Perhaps more so than most military occupational specialties (MOSs). This is because the parachute rigger has the lives of fellow soldiers in his hands on a daily basis. It is *vital* that riggers adhere to the strictest safety practices both on the job and in training.

An underlying cause of many accidents is fatigue. Fatigue leads a soldier to make mistakes he would not make when well rested and alert. Parachutes are critical life support systems requiring total concentration during the pack process. Leaders need to ensure the rigger's attention to detail does not slip away as the day wears on into a routine.

A daily hazard is the rigger's knife. Improper knife usage results in cuts causing lost duty days. Frequently a knife is left in the open position to make the "next cut," resulting in an injury because the rigger picked up the knife by the blade. Another problem is cutting with the sharp edge of the blade toward the body. A slip causes an injury.

Airdrop rigging operations can be dangerous. Familiarity with routines of "rig outs" breeds carelessness. As they work, riggers get on top of loads several feet off the ground. Failure to maintain three points of contact while on a load can result in slips or falls. Cranes and forklifts place loads on platforms. These lift machines must be load tested and meet safety standards. **Never** let a soldier get under a



suspended load. When loads are being moved in confined areas on trucks, make sure both front and rear ground guides are in place. Instruct drivers to **STOP** if they lose sight of their ground guide.

In parachute maintenance, make sure soldiers wear eye protection while sewing. The operator should never leave a machine without turning it off and draining the power. Never attempt to replace the bobbin or make internal adjustments while a sewing machine is on.

Parachute operations are inherently dangerous, resulting in the "hazardous duty" status of paid parachutist positions. Hazardous duty orders must be published for each parachutist assigned to an authorized paid parachutist position. Jump refresher and jumpmaster refresher training should occur at regular intervals. Sustained airborne training is the final safety check the airborne commander has before a jump. This ensures that his parachutists are trained to standard. A good rule of thumb here is to "exceed the standard." All manifested parachutists must properly demonstrate aircraft exit procedures and the five points of performance: (1) check body position and count, (2) check canopy, (3) keep a sharp lookout during descent, (4) prepare to land and (5) land. Soldiers also need refresher training on parachute landing falls.

The parachute rigger performs a vital link in our AirLand Battle doctrine. Whether rigging for the deployment of a battle force or sustainment of a force committed in battle, the parachute rigger must complete diverse duties in the safest manner possible. The rigger motto should apply to safety also-*I Will Be Sure-Always.*

CW4 David P. Blacka is the Senior Airdrop Systems Technician for the Airborne and Field Services Department, U.S. Army Quartermaster Center and School, Fort Lee, Virginia.

CPT Randy H. Butler is the Chief of the Instruction Division for the Airborne and Field Services Department, U.S. Army Quartermaster Center and School, Fort Lee, Virginia.

FIELD SERVICES SAFETY

CPT McKenley Mason

Laundry and bath operations are essential for the soldier's health and welfare. But they also pose some special hazards for operators. Awareness and attention to detail are key in accident prevention.

LAUNDRY OPERATIONS SAFETY

Laundry trailers have various components: 10-kilowatt (kw) generator, water heater, water pump, air compressor, washer/extractor and dryer. Without operator alertness and good safety precautions, serious injuries or death may occur. Some of the common hazards are listed here so they can be avoided later.

- Ground the generator with the grounding rod as close to the trailer as possible.
- Check the load terminal connection and voltage phase switch position before starting the engine.
- Keep moisture away from the generator and the area around it.
- Vent the exhaust pipe to the outside of the tent to release fumes.
- When lighting the water heater, make sure the operator sees the flame in the burner sight tube. If the flame is not visible, close the fuel shut-off valve and allow 15 seconds for the system to purge. Flooding the system with fuel before flaming can result in an explosion.
- During operation, watch for any unusual vibrations and listen for any unusual noises.
- Wear ear protection at all times during operation because the noise level exceeds allowable limits.

BATH OPERATIONS SAFETY

- During bath operations, pay attention to the water heater to prevent accidents. Since the fuel tank is close to the heating element, the tank could explode if correct operating procedures are not followed.
- When the bath team is at one location for any length of time, place sandbags around the equipment.
- Because the water heater exhaust duct becomes very hot during operation, do not touch it.
- Space heaters warm changing tents when operating in cold climates and also present hazards. Do not light the space heater when it is warm, and use only approved fuels.

Accomplishing the mission is always foremost in all leaders' thoughts. However, safety should never be sacrificed for the mission. Leaders must ensure compliance with these safety standards to prevent injuries to their soldiers.

CPT McKenley Mason is a Training Officer in the Field Services Division of the Airborne and Field Services Department, U.S. Army Quartermaster Center and School, Fort Lee, Virginia.

WATER QUALITY A PRIMARY MISSION

David L. Bruen

Safety in military operations should always be the highest priority. This is no less true for the Water Treatment Specialist (77W). They have the unique responsibility for not only their own safety, but also that of the soldiers they supply. Water quality is the 77W's primary mission.

Since commanders must ensure water supplies are potable and stay potable, medical personnel analyze the water from distribution points frequently. Biological examinations are performed on the water supply at least twice weekly. Water Treatment Specialists constantly monitor chlorine levels to ensure a safe product.Unit sanitation teams are an invaluable asset. They can be used to monitor unit water issue operations and to perform routine chlorine testing of unit water supplies. Commanders must activate and task sanitation teams to begin water testing as soon as possible.

Water distributed through pipe or tactical hoselines is susceptible to both incidental and deliberate contamination. Water supply personnel must monitor the chlorine residual of this water frequently. If the chlorine residual drops radically without reasonable explanation, water distribution operations must stop immediately. All available resources must then be used to investigate the reason for the drop. Under no circumstances should this water be rechlorinated first. It is imperative to first determine the cause of the initial chlorine depletion. The hoseline may have been deliberately contaminated with microorganisms. Some of these organisms are not affected by rechlorination. In addition, they are very difficult to detect by medical personnel and impossible to detect by water personnel.

Several safety concerns must be addressed when using the semi-trailer-mounted fabric tanks (SMFTs) for unit water distribution. First, the SMFT cannot be moved when partially loaded, because it is not baffled and partial loads are extremely unstable. Second, soldiers must not overtighten the restraining straps when loading the SMFT since this may cause the ratchets to break during movement. Third, it is better to remove the pressure gauge from the fill port before moving the loaded SMFT. The gauge can be damaged during movement over rough terrain. Fourth, the tank is rolled up and secured at the front of the trailer after unloading the SMFT. Failure to do this will result in damage to the fill port and valve during trailer movement with an empty tank. Because of the problem with dehydration in arid environments, military leaders must enforce rehydration programs. Commanders need to require all subordinate leaders to begin forced rehydration of soldiers. This program can be as simple as each squad leader insisting that each soldier drink one pint of water every hour. The squad leader, however, must insist that the soldier drink the water in his presence. Additionally, platoon leaders should begin a similar program for all platoon sergeants and squad leaders. This program will drastically reduce the incident of heat stroke and heat exhaustion. Soldiers need to know the nature of the arid environments and individual drinking requirements. They should be warned of the symptoms of dehydration. As a soldier loses water from the body, the desire for water (thirst) will disappear. This can have serious, even deadly, consequences.

Water purification operations also expose soldiers to other dangers.

As in any water purification, storage or distribution operation, soldiers are required to handle hazardous chemicals to perform their duties. The commander must ensure enforcement of established safety precautions. The appropriate technical manuals provide the necessary information on particular chemicals and first aid procedures. However, certain precautions are universal. Soldiers must wear eye protection and rubber gloves when handling chemicals. Ear protection must be worn when operating equipment that presents possible hazard to hearing. Immediate supervisors must enforce known safety rules and regulations.

Water purification operations create residual amounts of wastewater. Soldiers must dispose of this wastewater properly. During hostilities, the enforcement of environmental regulations and concerns may take a lower priority than providing sufficient quantities of potable water for soldiers to consume. However, water operations must never be allowed to become a health hazard to the operator. Isolate wastewater and waste chemicals from operational areas and dispose in approved dumpsite locations

All Army water purification and water pumping equipment uses petroleum fuels and lubricants. Safety must be observed when handling volatile fuels. Operators should never refill fuel tanks while equipment is running. Fire extinguishers must be present, operational and in prescribed locations. Soldiers must be constantly reminded by supervisors of the dangers of fuel and the precaution requirements.

The Water Treatment Specialist plays a key role in the safety of soldiers. Sustaining the Army safely is what their job is all about.

David L. Bruen is a Military Analyst (Petroleum and Water) in the Development, Evaluation and Validation Division of the Petroleum and Water Department, U.S. Quartermaster Center and School, U.S. Fort Lee, Virginia. He has spent the past five years writing training and doctrinal literature on military water supply. He holds a bachelor of arts degree in human resources from St. Leo College.

WATER QUALITY A PRIMARY MISSION

David L. Bruen

Safety in military operations should always be the highest priority. This is no less true for the Water Treatment Specialist (77W). They have the unique responsibility for not only their own safety, but also that of the soldiers they supply. Water quality is the 77W's primary mission.

Since commanders must ensure water supplies are potable and stay potable, medical personnel analyze the water from distribution points frequently. Biological examinations are performed on the water supply at least twice weekly. Water Treatment Specialists constantly monitor chlorine levels to ensure a safe product.Unit sanitation teams are an invaluable asset. They can be used to monitor unit water issue operations and to perform routine chlorine testing of unit water supplies. Commanders must activate and task sanitation teams to begin water testing as soon as possible.

Water distributed through pipe or tactical hoselines is susceptible to both incidental and deliberate contamination. Water supply personnel must monitor the chlorine residual of this water frequently. If the chlorine residual drops radically without reasonable explanation, water distribution operations must stop immediately. All available resources must then be used to investigate the reason for the drop. Under no circumstances should this water be rechlorinated first. It is imperative to first determine the cause of the initial chlorine depletion. The hoseline may have been deliberately contaminated with microorganisms. Some of these organisms are not affected by rechlorination. In addition, they are very difficult to detect by medical personnel and impossible to detect by water personnel.

Several safety concerns must be addressed when using the semi-trailer-mounted fabric tanks (SMFTs) for unit water distribution. First, the SMFT cannot be moved when partially loaded, because it is not baffled and partial loads are extremely unstable. Second, soldiers must not overtighten the restraining straps when loading the SMFT since this may cause the ratchets to break during movement. Third, it is better to remove the pressure gauge from the fill port before moving the loaded SMFT. The gauge can be damaged during movement over rough terrain. Fourth, the tank is rolled up and secured at the front of the trailer after unloading the SMFT. Failure to do this will result in damage to the fill port and valve during trailer movement with an empty tank. Because of the problem with dehydration in arid environments, military leaders must enforce rehydration programs. Commanders need to require all subordinate leaders to begin forced rehydration of soldiers. This program can be as simple as each squad leader insisting that each soldier drink one pint of water every hour. The squad leader, however, must insist that the soldier drink the water in his presence. Additionally, platoon leaders should begin a similar program for all platoon sergeants and squad leaders. This program will drastically reduce the incident of heat stroke and heat exhaustion. Soldiers need to know the nature of the arid environments and individual drinking requirements. They should be warned of the symptoms of dehydration. As a soldier loses water from the body, the desire for water (thirst) will disappear. This can have serious, even deadly, consequences.

Water purification operations also expose soldiers to other dangers.

As in any water purification, storage or distribution operation, soldiers are required to handle hazardous chemicals to perform their duties. The commander must ensure enforcement of established safety precautions. The appropriate technical manuals provide the necessary information on particular chemicals and first aid procedures. However, certain precautions are universal. Soldiers must wear eye protection and rubber gloves when handling chemicals. Ear protection must be worn when operating equipment that presents possible hazard to hearing. Immediate supervisors must enforce known safety rules and regulations.

Water purification operations create residual amounts of wastewater. Soldiers must dispose of this wastewater properly. During hostilities, the enforcement of environmental regulations and concerns may take a lower priority than providing sufficient quantities of potable water for soldiers to consume. However, water operations must never be allowed to become a health hazard to the operator. Isolate wastewater and waste chemicals from operational areas and dispose in approved dumpsite locations

All Army water purification and water pumping equipment uses petroleum fuels and lubricants. Safety must be observed when handling volatile fuels. Operators should never refill fuel tanks while equipment is running. Fire extinguishers must be present, operational and in prescribed locations. Soldiers must be constantly reminded by supervisors of the dangers of fuel and the precaution requirements.

The Water Treatment Specialist plays a key role in the safety of soldiers. Sustaining the Army safely is what their job is all about.

David L. Bruen is a Military Analyst (Petroleum and Water) in the Development, Evaluation and Validation Division of the Petroleum and Water Department, U.S. Quartermaster Center and School, U.S. Fort Lee, Virginia. He has spent the past five years writing training and doctrinal literature on military water supply. He holds a bachelor of arts degree in human resources from St. Leo College.

PROFESSIONAL READINGS

The Professional Readings section of the *Quartermaster Professional Bulletin* is designed to encourage the professional development of all Quartermasters. Titles are selected from the Quartermaster School Professional Reading List, the current Department of the Army Contemporary Military Reading List, as well as other notable sources. Short reviews from the field are welcome.

Mask Of Command

John Keegan, Viking Press Inc., New York, 1987

Keegan analyzes Alexander the Great, Wellington, Grant and Hitler as military commanders and leaders in his latest book. He examines these leaders' differing command styles and evaluates the imperatives of leadership necessary for successful command before the nuclear age.

Defeat of Imperial Germany: 1917-1918

Rod Paschall, Algonquin Books of Chapel Hill, 1989

In this revisionist view of World War I, Paschall contends that imaginative tactics and techniques invented in World War I failed only because they were applied ahead of their time, not because they were misapplied. This differs from the conventional view that field generals were mediocre at best and sent their troops to die in waves simply because they could think of no better way to conduct a war of attrition.

History of the United States Army

Russell F. Weigley, Indiana University Press, Bloomington, IN, 1984

This comprehensive history of the U.S. Army from Colonial times to the present focuses on institutional history and the historic tension between professional and citizen armies. The author sees the dual American military traditions as a special strength in our democracy. Although very informative, this book is dull reading.

Mud Soldiers: Life Inside the New American Army

George C. Wilson, Charles Scribner's Sons, New York, 1989

Wilson traces the lives of soldiers in a Cohesion, Operational Readiness Training (COHORT) infantry unit from basic training to their first assignment. Often critical of the Army, this book does make a contribution by forcing the reader to consider military life from the point of view of the private soldier.

The Leadership Challenge: How to Get Extraordinary Things Done in Organizations

James M. Kouzes and Barry Z. Posner, Jossey-Bass, 1987

The authors examine the experiences of 500 successful managers and, by using their experiences, show that leadership can be learned. The thesis is that leadership involves 5 basic practices and 10 specific behaviors.

From Hiroshima to Glasnot: A Memoir of Five Perilous Decades

Paul H. Nitze, Grove Weidenfeld, 1989

Since the mid-1940s, Ambassador Nitze has been one of the key "wise men" of American government. He provides an overview of the challenges he has faced and the reasons behind the decisions he has made over the past five decades in the developing and ever-changing relationship between the United States and the Soviet Union.

OPERATION DESERT SHIELD: LESSONS LEARNED

Unclassified lessons learned by Quartermaster soldiers during graves registration, subsistence,airdrop, laundry and bath, and petroleum and water missions in Operation Desert Storm are available to units through the U.S. Army Combined Arms Support Command and Fort Lee (USACASCOM&FL) data base. To obtain copies of detailed information from the unclassified portion, contact Mr. Wells or Mrs. Freeman, DSN 687-1043, Commercial (804) 734-1043. Send written requests to Commander, U.S. Army Combined Arms Support Command and Fort Lee, ATTN: ATCL-TET, Fort Lee, VA 23801-6000.

HOTLINE ASSISTANCE

The U.S. Army Quartermaster Center and School at Fort Lee, VA, offers a telephone hotline 24 hours a day, 365 days a year. The Office of Evaluation and Analysis provides assistance about where and how to obtain technical, doctrinal and training publications, audiovisual and other training media, and responds to a variety of Quartermaster-proponent inquiries. The numbers are DSN 687-3767, Commercial (804) 734-3767, 1-800-554-4570 outside Virginia, and 1-800-552-4820 within Virginia. Collect calls will not be accepted. Send written requests for assistance to Commander, U.S. Army Quartermaster Center and School, ATTN: ATSM-OEA, Fort Lee, VA 23801-5034.

3,000-GALLON PER HOUR ROWPU

The initial production models of the 3,000-gallon per hour Reverse Osmosis Water Purification Unit (ROWPU) deployed to support Operation Desert Storm in Saudi Arabia. Production of additional ROWPUs will begin despite ROWPU deficiencies noted during initial testing. A conditional release was granted to begin production after a review of actions by the contractor to correct deficiencies. New tests are planned for Summer 1991 to verify that the contractor corrected shortcomings. Point of contact for information is MAJ Templin, DSN 687-3238.

COLD WEATHER WATER POINT OPERATIONS

The Directorate of Combat Developments, U.S. Army Quartermaster Center and School, the U.S. Army Belvoir Research, Development and Engineering Center, and the 6th Infantry Division (Light) cooperated in an exercise to develop a cold weather kit for the 600-gallon per hour Reverse Osmosis Water Purification Unit (ROWPU). They conducted the successful exercise in subzero temperatures at Fort Wainwright, AK, in November 1990. The kit included Tent Extendable, Modular, Personnel (TEMPER) tents, heaters and ice augers. ROWPU operations continued at -60 degrees Fahrenheit. Follow-on work with water distribution in subzero temperatures is planned. For additional information, contact MAJ Templin, DSN 687-3238.

ATLAS UPDATE

The All-Terrain Lifter, Articulated System (ATLAS) will replace the current Army 4,000-pound, 6,000 pound, and 1 0,000-pound rough terrain forklifts beginning in FY 98. The draft of the ATLAS required operational capability (ROC) document has been distributed worldwide. The ROC joint working group is scheduled for March 1991. The final ROC document will be submitted to the U.S. Army Training and Doctrine Command (TRADOC) for approval May 1991. ATLAS users (operators, maintainers, repairers) have been surveyed at TRADOC schools and at Operation Desert Storm to analyze their priorities for required operational characteristics. This information will confirm the ROC ' s characteristics for the ATLAS. Chief of the ATLAS Team is Ms. Stell, DSN 687-3066.

MHEMP UPDATE

The Deputy Chief of Staff for Operations and Plans, Department of the Army, Materials Handling Equipment Modernization Plan (MHEMP) is ready for approval by the Chief of Staff of the Army. This strategic planning document provides the basis for modernizing the Army's materials handing equipment (MHE) fleet through the

year 2020. It balances resourcing and procurement with the Army's need to modernize approximately 25,000 pieces of equipment. The MHEMP also considers cost savings within tight budgets and production base limitations.

The MHEMP's chief effort is the All-Terrain Lifter, Articulated System (ATLAS). As stated in the MHEMP, AirLand Battle-Future was the evolutionary war fighting concept of AirLand Battle doctrine. The ATLAS is the lift mechanism needed for the mobility, agility and endurance essential to AirLand Operations. The ATLAS will lighten the Army's logistical tail by reducing the MHE required for support units. The MHEMP identifies the replacement of older equipment with modernized MHE, allowing private industry to plan corporate strategies to support future Army requirements. For further information, contact Ms. Stell, DSN 687-3066.

PACKAGED WATER

The Directorate of Combat Developments will be staffing an Organizational and Operational Plan worldwide during Third Quarter, FY 91 for a system to package potable water. Packaged water will lessen some difficulties in transporting water to the individual soldier. Packaging will allow handling water for unit-level consumption as dry cargo. Packaging water will not require bulk storage tanks and multiple bulk liquid transfers. It will also ease tailoring of logistics packages. The system will not eliminate the need for bulk water distribution to major users such as hospitals and laundry and bath points. For further information, contact MAJ Templin, DSN 687-3238.

WQAU-P

A replacement for the current engineer set for water analysis is being tested at Aberdeen Proving Ground, M D. The Water Quality Analysis Unit-Purification (WQAU-P) will provide preventive medicine and water treatment specialists with simple-to-operate electronic devices for measuring pH, temperature, total dissolved solids and turbidity. For further information, contact MAJ Templin, DSN 687-3238.

AIRDROP FIELD MANUALS

The Publications Branch of the Airborne and Field Services Department, U.S. Army Quartermaster Center and School, Fort Lee, VA, has revised its original list of airdrop field manuals (FMs) scheduled to be changed or revised in FY 91. The new list of FMs follows:

FM 10-519,	C3	Rigging 105-mm Howitzer
FM 10-501,	C1	Rigging Containers
FM 10-500-2,	C1	Rigging Airdrop Platforms
FM 10-520,	C2	Rigging 2 1/2-Ton Trucks
FM 10-550,	C2	Rigging Stinger Weapon Systems and Missiles
FM 10-564,	C5	Rigging Fuel Drums
FM 10-526,	C3	Rigging 5-Ton Trucks
FM 10-517,	C3	Rigging HMMWV
FM 10-512 ,	C4	Rigging Typical Supply Loads

MEAL, ORDERED READY TO EAT (MORE)

The Meal, Ordered Ready to Eat (MORE) Contingency Test (CT) is a combined Army and industry answer to a short-term problem in feeding large numbers of soldiers who mobilize quickly. The MORE (CT) is an assortment of individual, portion-sized, shelf-stable, ready-to-eat, commercial foods assembled into 12 different menus.

The concept of the MORE (CT) was tested during the United States Army, Europe (USAREUR) assessment in FY 89. Initial feedback was very positive. When soldiers can identify their rations by brand names, they seem to enjoy the food more. Recently the MORE (CT) supported Operation Desert Storm. Feedback from the field has identified the MORE as one of the more popular rations. The assessed MORE (CT) contains a Hormel "Top Shelf" brand of entree and Del Monte brand of canned fruit, among other items. The ration does not have to be "sold" to the soldiers. They were familiar with the brand names and associated the ration with commercially acceptable and popular items.

Since the assessment, the MORE (CT) has undergone several major changes. Each MORE (CT) menu currently contains:

- A single-serving commercial entree (12 entrees).
- Commercial single-serving soup with crackers.
- Single-serving commercial "wet pack" fruit.
- Name brand candy or cookies.
- Milkshake powder.
- Commercial accessory items such as coffee, beverage powder, spoon and moist towelette. Soldiers can heat the MORE (CT) by several different methods. In a consolidated feeding environment, standard field kitchen equipment

heats the water before the entree goes into the boiling water. This is similar to the way the T-Ration is heated . The flameless ration heater or the canteen cup stand with heat tab is used during remote feeding or for individual preparation.

SUBSISTENCE WARRANTY

All subsistence items purchased by a Defense Personnel Support Center (DPSC) are covered by a contractual warranty clause which states that the items "will be free from defects in material or workmanship and will conform with the specifications and all other requirements of the contract." The warranty becomes effective when the first supply point, which may be a depot or a Troop Issue Subsistence Activity (TISA), receives the item.

A defective product may not be noticed until removed from its container. If the warranty is still in effect, the government has the right to request replacement. It is important, therefore, to report defective items promptly by using a DD Form 1608 (Unsatisfactory Material Report (Subsistence)), as specified in AR 30-16 (Food Service Data Feedback Program).

The person who detects the defective product may not know if it is still under warranty. After reporting the defect on a DD Form 1608, he should place the product subject to possible warranty action in "hold" status, since consumed products are not subject to warranty provisions of the contract. Products are warranted as follows: perishable items - 120 days; semiperishable items - 180 days; and coded items - standard commercial warranty offered by vendor.

150,000-GALLON PER DAY ROWPU

The large training requirements for soldiers qualified to operate the 150,000-gallon per day Reverse Osmosis Water Purification Unit (ROWPU) in Operation Desert Storm resulted in adding this equipment to the training program at the U.S. Army Quartermaster Center and School, Fort Lee, VA. Training at Fort Lee will continue on the 150,000-gallon per day ROWPU until the new trailer-mounted, 3,000-gallon per day ROWPU is fully fielded and has replaced the interim 150,000-gallon per day requirement.

MODIFIED ROM KIT

The Refuel on the Move (ROM) Kit has been modified based on feedback from United States Army Forces Command (FORSCOM) and United States Army, Europe (USAREUR) operating units. The following changes were made: 75-foot spacing between nozzles; a gate valve added to the tanker discharge line; nozzle hoses 50 feet long; a ball valve for each nozzle hose; and automatic shut-off for nozzles. The new kit was sent to units in Operation Desert Storm. The National Stock Number (NSN) for the modified kit is 4320-01-295-1482.

YEAR GROUP 86 FUNCTIONAL AREA SELECTION

Functional area designations for Year Group 1986 Officers are scheduled to begin in June 1991. Officers will receive letters in July requesting that they return their preferences to the U.S. Total Army Personnel Command (PERSCOM) by September. If any Year Group 1986 Officers do not receive a letter by the end of August, please contact us. PERSCOM will complete the designation process in October/November. The results should be announced in December 1991.

DA Pamphlet 600-3 (Commissioned Officer Professional Development and Utilization) requires all officers to be designated a functional area or be single-tracked in their basic branch in their fifth year of commissioned service. The criteria for functional area designation include civilian education, military training, assignment experience and performance. Ultimately, functional areas are assigned to officers based on the Army's needs and individual qualifications and preferences.

Once assigned a functional area, the officer must hold that functional area for two years. After two years, an officer can request to be single-tracked or be designated another functional area. Send requests to Quartermaster Branch, ATTN: DAPC-OPG-QM (Future Readiness Officer) 200 Stovall Street Alexandria, VA 22332. PERSCOM conducts functional area change boards and single-track boards two times a year in March and September. Point of contact at PERSCOM is MAJ Dean Delis, Future Readiness Officer, DSN 221-8119/8123.

QUARTERMASTER OFFICER ADVANCED COURSE DATES

Class dates for FY 91 Quartermaster Officer Advanced Courses are:

91-3	18 Mar 91 - 16 Aug 91
91-4	6 May 91 - 4 Oct 91
91-5	8 Jul 91 - 6 Dec 91
91-6	3 Sep 91 - 14 Feb 92

TWI, ACS AND LEDC APPLICATIONS

The deadline for requests to attend the Logistics Executive Development Course (LEDC) at the Army Logistics Management College during fiscal year 1992 is 15 June 1991. Requests to attend Advanced Civil Schooling (ACS) or the Training With Industry (TWI) program during fiscal year 1992 is 1 August 1991. Officers desiring to attend one of these programs may call MAJ John Angevine at Quartermaster Branch PERSCOM for more information DSN: 221-8119/8123.

RC EXPORTABLE MODEL PROGRAM

The Exportable Model Program began in 1981 to fill a void in Reserve Component (RC) combat service support (CSS) training and provide standardization in CSS training exercises. Building on this program, the U.S. Army Combined Arms Support Command and Fort Lee, Fort Lee, VA, is currently developing 10 separate packages for the following types of units: area support group, corps support group (forward and rear), corps support battalion (forward and rear), maintenance battalion, petroleum supply battalion, transportation motor transport battalion, ordnance battalion and supply and services battalion. The training packages for corps support command (COSCOM) units are being developed according to FM 54-30 (Corps Support Groups). These exportable packages are designed for use by the RC training community and CSS units or active units who need to expand their training while reducing time spent in exercise development. The packages will also provide standardization in logistics data and doctrine across CSS exercises. The packages contain all operation plans/orders, maps, references and data necessary to conduct a 72-hour command post exercise at home station. The primary emphasis is to exercise group and battalion commanders and staffs in their areas of responsibility, refine command and staff procedures, enhance communication skills and develop unit Army training and evaluation program (ARTEP)/mission training plan proficiency. Fielding is expected during 4th quarter FY 91 in paper copies and floppy discs.

To obtain the packages, call Sherril Hiltz, Logistics Management Specialist, Fort Lee, VA, DSN 687-2531/4862, Commercial (804) 734-2531/4862, or send a written request to: Commander, U.S. Army Combined Arms Support Command and Fort Lee, ATTN: ATCL-LTS, Fort Lee, VA 23801-6000.

P&WANCOC REQUIRES MATHEMATICS

Soldiers who attend the Petroleum and Water Advanced Noncommissioned Officer Course (P&WANCOC) need a solid background in mathematics. Students must be familiar with basic formulas in multiplication, division and fractions and also must be able to use these formulas in algebraic equations. Students must know how to use a calculator. For a basic mathematics refresher workbook, contact Arthur LeMire, P&WANCOC course director, at DSN 687-3427/2407 or Commercial (804) 734-3427/2407 or write to Commander, U.S. Army Quartermaster Center and School, ATTN: ATSM-PWD-A (P&WANCOC), Fort Lee, VA 23801-5042.

TWI, ACS AND LEDC APPLICATIONS

The deadline for requests to attend the Logistics Executive Development Course (LEDC) at the Army Logistics Management College during fiscal year 1992 is 15 June 1991. Requests to attend Advanced Civil Schooling (ACS) or the Training With Industry (TWI) program during fiscal year 1992 is 1 August 1991. Officers desiring to attend one of these programs may call MAJ John Angevine at Quartermaster Branch PERSCOM for more information DSN: 221-8119/8123.

RC EXPORTABLE MODEL PROGRAM

The Exportable Model Program began in 1981 to fill a void in Reserve Component (RC) combat service support (CSS) training and provide standardization in CSS training exercises. Building on this program, the U.S. Army Combined Arms Support Command and Fort Lee, Fort Lee, VA, is currently developing 10 separate packages for the following types of units: area support group, corps support group (forward and rear), corps support battalion (forward and rear), maintenance battalion, petroleum supply battalion, transportation motor transport battalion, ordnance battalion and supply and services battalion. The training packages for corps support command (COSCOM) units are being developed according to FM 54-30 (Corps Support Groups). These exportable packages are designed for use by the RC training community and CSS units or active units who need to expand their training while reducing time spent in exercise development. The packages will also provide standardization in logistics data and doctrine across CSS exercises. The packages contain all operation plans/orders, maps, references and data necessary to conduct a 72-hour command post exercise at home station. The primary emphasis is to exercise group and battalion commanders and staffs in their areas of responsibility, refine command and staff procedures, enhance communication skills and develop unit Army training and evaluation program (ARTEP)/mission training plan proficiency. Fielding is expected during 4th quarter FY 91 in paper copies and floppy discs.

To obtain the packages, call Sherril Hiltz, Logistics Management Specialist, Fort Lee, VA, DSN 687-2531/4862, Commercial (804) 734-2531/4862, or send a written request to: Commander, U.S. Army Combined Arms Support Command and Fort Lee, ATTN: ATCL-LTS, Fort Lee, VA 23801-6000.

P&WANCOC REQUIRES MATHEMATICS

Soldiers who attend the Petroleum and Water Advanced Noncommissioned Officer Course (P&WANCOC) need a solid background in mathematics. Students must be familiar with basic formulas in multiplication, division and fractions and also must be able to use these formulas in algebraic equations. Students must know how to use a calculator. For a basic mathematics refresher workbook, contact Arthur LeMire, P&WANCOC course director, at DSN 687-3427/2407 or Commercial (804) 734-3427/2407 or write to Commander, U.S. Army Quartermaster Center and School, ATTN: ATSM-PWD-A (P&WANCOC), Fort Lee, VA 23801-5042.

SUBMISSION GUIDELINES FOR QUARTERMASTER PROFESSIONAL BULLETIN

TO ASSIST YOU IN PLANNING YOUR ARTICLES, WE OFFER THE FOLLOWING GUIDELINES:

- Submit articles in the form of typewritten, double-spaced drafts, consisting of no more than 10 pages to :

COMMANDER
U.S. ARMY QUARTERMASTER CENTER AND SCHOOL
ATTN: ATSM-QMG-B (MILITARY EDITOR, *QMPB*)
FORT LEE, VA 23801-5032

- Ensure that all articles relate to and support the mission of the Quartermaster Corps. Articles should address technological developments, tactics, techniques and procedures, "how to," practical exercises, training methods, historical perspectives, and viewpoints.

- Per TRADOC guidance, the *Quartermaster Professional Bulletin (QMPB)* **cannot** publish personal notices (to include routine notices of promotions, assignments, and graduations); personality oriented articles (except for those with historical significance); and routine news items.

- The target audience for the *QMPB* is Corps-wide. It includes junior enlisted soldiers, noncommissioned officers, warrant officers, commissioned officers and DA civilians within the Quartermaster Corps. The reading level of articles submitted should reflect this. (The editorial staff will provide you with assistance if you have any questions).

- If graphics are desired to support your article, please let the staff of the *QMPB* know in advance of submission. They will then have the time to develop the artwork, allowing you to review it for accuracy before the final camera-ready mechanicals are sent to the printer.

- When submitting photos or art, please provide clear, original prints or negatives whenever possible. Black and white photos are preferred. All photos and artwork will be kept on file at this office unless otherwise requested.

- When preparing your articles, please recall that the *QMPB* is more interested in content than in style. Our staff is here to help you during the writing process, if you need it, and is responsible for editing your submissions for grammar, syntax, and format. Our basic requirement from you is information.

- POCs for the *Quartermaster Professional Bulletin* are CPT Michael P. Gilroy, Linda B. Kines, and Judy A. Charlotte, DSN 687-4382 or Commercial (804) 734-4741.

QUARTERMASTER PROFESSIONAL BULLETIN
SUBMISSION SHEET

The *Quartermaster Professional Bulletin* welcomes submissions by its readers on all topics pertinent to the past, present or future of the Quartermaster Corps. In order to provide the most complete information available on all materials submitted, please use the following form and enclose a copy of it when you send us any items intended for future publication. If you find that you require more space, use a piece of plain paper and follow the guidelines on the form to provide additional information.

Author's Name: _____
Last, First, M.I., Rank/Grade

Address: _____ Phone: _____

Organization/Activity: _____

Branch/MOS: _____ Duty Title: _____

Civilian Education: _____

Military Education: _____

Duty Assignments: _____

Date the article was written/revised: _____

Approving Official: _____ Phone: _____
(If Command/Local Authority requires approval for submission.)

NOTE: ENSURE MATERIAL IS UNCLASSIFIED.

If the article appeared in another publication:

Date: _____ Name of Publication: _____

PHOTO/ART CREDITS

Please label and provide the following information for each piece submitted:

- Description of events or process
- Equipment (Nomenclature)
- Date
- Activity/Organization/Unit
- Personnel (Name, Rank if known)
- Location (Specific Site, Town or City, Country)
- Exercise
- Photographer/Artist:

QMPB SUBMISSION SHEET

Privacy Act of 1974

1. AUTHORITY: 10 USC Section 3013, Office of the Secretary of the Army.

2. PRINCIPAL PURPOSE: To obtain information on personnel submitting articles for publication. If possible only official addresses and phone numbers are needed. In those cases, where official addresses are not available, home addresses and phone numbers are requested.

3. ROUTINE USES: Information will be maintained in files and used for identification of author and for publishing biographical data, as necessary, with article. Where home addresses are provided, only city and state will be used in the biography.

4. MANDATORY OR VOLUNTARY DISCLOSURE AND EFFECT ON INDIVIDUAL NOT PROVIDING INFORMATION: Disclosure of the requested information is voluntary. Failure to provide the requested information may result in publishing an incomplete biography or in denying publication of article.

FT LEE Form 102
Apr 91

Army Fort Lee,Va.3887-91-50-1

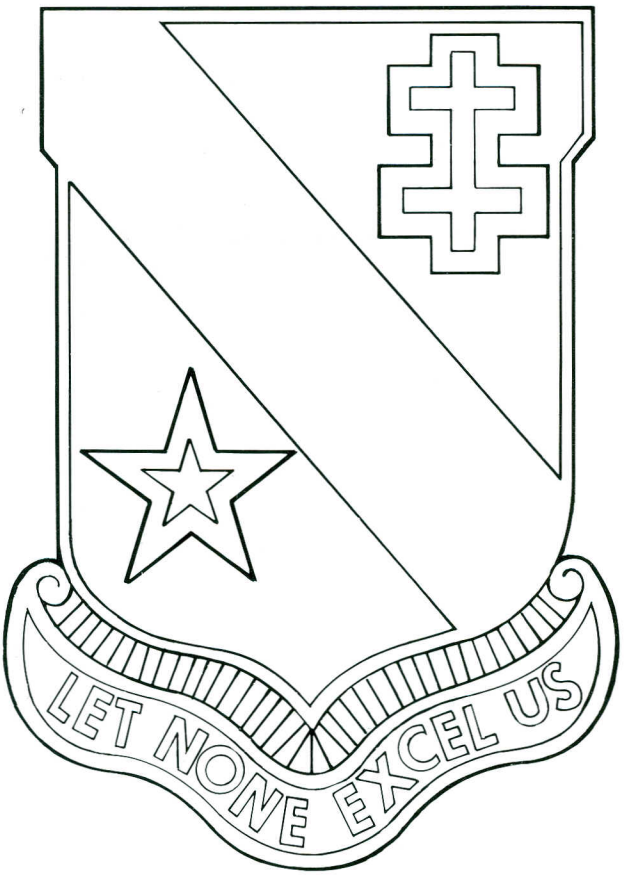
IN MEMORY

THE SOLDIERS OF THE QUARTERMASTER CORPS WHO PERISHED DURING OPERATION DESERT STORM:

MAJ Earl K. Stribling
CPT Joseph G. Kime
2LT Shannon P. Kelly
SSG Donald Morgan
SGT Tommy A. Blue
SGT John T. Boxler
SGT Donald Danielson
SGT Arthur Jackson
SGT Jeffrey A. Rollins
SGT Baldwin Satchell
SGT Lawrence N. Welch
CPL Brian Keith Simpson
CPL Jonathan M. Williams
SPC Beverly S. Clark
SPC Mark R. Cronquist
SPC Frank S. Keough
SPC Anthony Madison
SPC Christine L. Mayes
SPC James R. Miller, Jr.
SPC Thomas G. Stone
SPC James D. Tatum
SPC Richard V. Wolverton
PFC Gerard A. Cohen
PFC Melford R. Collins
PFC Timothy A. Shaw
PV2 Adrienne L. Mitchell

WE HONOR THEIR DEDICATED SERVICE AND GRIEVE THEIR LOSS.

7th SUPPLY AND TRANSPORT BATTALION



"LET NONE EXCEL US"

LINEAGE

Constituted 10 November 1917 in the Regular Army as the 7th Supply Train, an element of 7th Division

Organized 10 May 1918 at Camp MacArthur, Texas

Reorganized and redesignated 19 February 1921 as 7th Division Train, Quartermaster Corps

Inactivated 24 September 1921 at Camp George G. Meade, Maryland

Redesignated 23 March 1925 as the 7th Division Quartermaster Train

Redesignated 1 May 1936 as the 7th Quartermaster Regiment

Regiment broken up 1 October 1939 and its elements reorganized, redesignated, and activated or disbanded as follows:

Headquarters and Headquarters Company and Company E consolidated to form Headquarters and Headquarters Company, 7th Quartermaster Battalion; Companies A and B consolidated to form Company A, 7th Quartermaster Battalion; 7th Quartermaster Battalion relieved from assignment to the 7th Division, assigned to the 6th Division, and activated at Omaha, Nebraska

(Remainder of regiment disbanded)

7th Quartermaster Battalion relieved 1 July 1940 from the 6th Division and assigned to the 7th Division (later redesignated as the 7th Infantry Division)

Reorganized and redesignated 9 April 1942 as the 7th Motorized Quartermaster Battalion

Reorganized and redesignated 10 January 1943 as the 7th Quartermaster Company; 7th Infantry Division

Reorganized and redesignated 7 November 1943 as the 7th Quartermaster Company

Reorganized and redesignated 1 July 1963 as the 7th Supply and Transport Battalion (organic elements concurrently constituted and activated)

Inactivated 2 April 1971 in Korea

Activated 21 February 1975 at Fort Ord, California

DEPARTMENT OF THE ARMY
U.S. ARMY QUARTERMASTER CENTER
AND SCHOOL
ATTN: ATSM-QMG-B
FORT LEE, VIRGINIA 23801-5032

OFFICIAL BUSINESS

BULK RATE
POSTAGE & FEES PAID
PETERSBURG, VA
PERMIT NO. 30

PIN: 067449-000