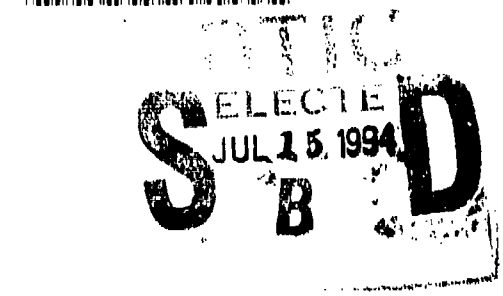

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Transporting the Army for Operation Restore Hope

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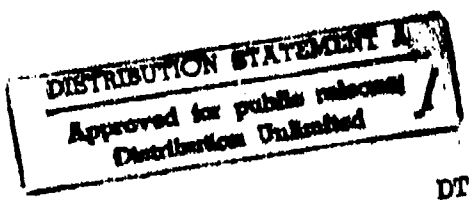

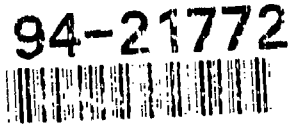

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Transporting the Army for Operation Restore Hope

David Kassing

Prepared for the United States Army

Arroyo Center

PREFACE

In Operation Restore Hope, the Army provided many of the capabilities needed to realize President Bush's commitment to "ensure the safe delivery of the food Somalis need to survive." Although the exact conditions of the deployment are not likely to recur, deployments to Somalia and operations there have something to teach about humanitarian and peacemaking operations, military roles that appear to be taking on increasing importance. This report analyses the transportation of Army forces to Somalia for Restore Hope and identifies five issues about transportation for Army leadership to consider as they shape the future Army.

This work is based upon interviews with Army and Joint personnel who participated in planning, conducting, and making Army deployments to Somalia. Data compilations are based on reviews of a wide variety of briefings and situation reports prepared by the participants while Restore Hope operations were under way. (The data collection was completed prior to the transition of responsibility to the United Nations on May 4, 1993. Thus, this review does not examine more recent U.S. Army deployments to Somalia or the military operations there.) The results should be of interest to planners in the Army facing the manifold problems of shaping the Army for the missions of the early 21st century.

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SUMMARY

On December 4, 1992 President Bush gave the order "to move a substantial American force into Somalia." Although Army forces contributed substantially to the Joint Task Force, the Army did not dominate the deployments to the degree it did during Operation Desert Storm. Still, by the end of January more than 10,000 Army personnel were on the ground in Somalia, helping to provide security for relief operations and working to rebuild many of the basic elements of civil society. This report reviews the Army deployment operation and raises five issues for Army leaders to consider in preparing the Army for future humanitarian deployments.

By almost any measure, the transportation of the Army to Somalia can be judged a successful operation. During the first 30 days, 82 percent of the peak U.S. personnel strength and more than half the Army equipment had been delivered. The deployments accomplished the goals set forth by President Bush.

Nonetheless, many participants speak of difficulties and glitches in planning, coordinating, and managing the deployments. In spite of these frictions, the nature of the humanitarian mission and the relatively small scale of the deployments (about five percent of Operation Desert Shield/Storm) allowed the deployments to go off without debilitating problems.

DEPLOYMENT PLANNING

Planning for Restore Hope began in the third week of November 1992, about two and a half weeks before D-day. Though deployment

planners did not have a detailed operational plan to work from, they should have had a good appreciation of the needs of the humanitarian mission, the general size of the forces deploying, the devastated infrastructure in Somalia, and the climate there. By D-day, plans for the deployment were well along, although Army support forces had not been fully defined. Army and Joint transportation organizations had activated crisis action teams and begun to "lean forward" in anticipation of the order to execute deployments to Somalia.

DEPLOYMENT COMMAND AND CONTROL

The U.S. Central Command designated the I Marine Expeditionary Force as the Joint Task Force (JTF) commander for the operation. The execution order for Restore Hope came on December 5 and movements in support of the deployment began two days later. Although the Department of Defense's "deliberate planning" focuses on the development of a Time Phased Force Deployment Data (TPFDD) set, there was no preexisting TPFDD for Somalia. The advertised virtue of the TPFDD is that it provides a common "script" to coordinate the actions of deploying forces and transportation operations. Many participants complained that the TPFDD was constantly changing and that, without a reliable plan, lift was wasted.

The evidence supports the view that TPFDDs were often changed. A comparison of planned TPFDD movements for given days reveals frequent changes in the identification of units for personnel moves as well as wide swings in the numbers of Army soldiers to be moved. Although command, control, and communications system design problems may have played a small role in causing unanticipated variations, other factors dominated. As the commanders on the ground in Somalia gained understanding of the situation, they were able to refine and reduce their requirements. Changes induced by the inability to offload Army prepositioning ships, the deterioration of runways, the effects of weather, and the deployment requirements of coalition forces all contributed to changes in the TPFDD.

Movement to Ports

Army movements to ports went rapidly and smoothly. By D+10 the Army had delivered nearly 30,000 tons of cargo to CONUS seaports,

largely by rail. The movement of USAREUR (U.S. Army Europe) aviation units by rail to Italian ports was somewhat more complicated, but the units were not seriously delayed.

Airlift Operations

The rate of airlift deployments to Somalia was constrained by the small size and poor quality of airfield facilities there. It became necessary to meter airlift into the theater so as to match available airfield capacity. By Air Mobility Command estimates, airlift was able to use nearly 100 percent of limited system cargo capacity during the first 20 days of Restore Hope. Passenger deliveries, however, were constrained by capacity only during the first 10 to 12 days.

Deployments of Army personnel went slower than some had expected, probably as a consequence of the decision to ship most Army unit equipment by sea. The decision implied that Army troops and equipment could not be "married up" in Somalia before early January. By mid-January the Army had received 37 to 39 percent of passenger airlift. During January, Army strength in Somalia tripled to just over 10,000 troops, well below the 13,400 that planners had envisioned early in December.

Sustainment airlift channel flights did not begin until late December, and even then the rate of cargo delivery was slow.

Prepositioning

Army prepositioning ship performance was unsatisfactory, tolerable only in the context of the Restore Hope mission. Army supplies and equipment that under good conditions might have been ashore in Somalia in the first ten days were not landed for 20 or 30 days or more. Adverse weather and prudent management prevented the prepositioned LASH ships from offloading outside the Mogadishu port. The delivery of watercraft, normally prepositioned at sea in the Indian Ocean, was delayed because the ship was in Europe for periodic maintenance.

Sealift

The Army was sealifted to Somalia with available Department of Defense (DoD) shipping—ships already under charter and six of the nation's Fast Sealift Ships (FSSs). Nearly 1.1 million square feet of Army unit equipment was shipped to Somalia. The first ship arrived on January 1; the last in mid-February. Shipping deliveries were below theoretical capacity largely because of capacity constraints at Mogadishu and the competition from shipping carrying coalition forces and humanitarian supplies. There was only a single berth capable of handling FSSs, so these ships (all six loaded with Army cargo) had to be metered into the port one after the other.

Consumables (largely food and construction materials) were shipped to Somalia in two ways. DoD-controlled ships carried some directly to Somalia. The second channel used commercial ships to carry containers to Alexandria, Egypt, where they were transferred to DoD shipping for final delivery to Mogadishu.

Deployment Operations Within Somalia

Reception operations in Somalia were conditioned by the devastated state of the seaport and airport facilities there. Moreover, the ports were busy handling coalition and humanitarian cargo and personnel as well as Marine and other U.S. service needs. During the first 37 days, Army cargo flowing through the port at Mogadishu was only about 20 percent of the total. Appropriately, given the Restore Hope mission, humanitarian cargo amounted to 37 percent of throughput during the same period. The remainder was Marine Corps and coalition forces cargo.

Onward movement operations were relatively limited. Many Army units remained in the vicinity of their ports of debarkation at Mogadishu and Baledogle. Army transporters in the theater supported Army operations, helped other military services, and assisted humanitarian operations.

Observations and Issues

There is no doubt that Restore Hope met the immediate humanitarian objectives set by President Bush. U.S. and coalition forces im-

proved security for relief organizations, starvation was dramatically reduced, and responsibility transferred to the United Nations in less than five months. Although a single operation cannot lead to hard conclusions, Army leaders should consider five issues that have emerged from this review.

- **Adapting the Joint Deployment System.** The Army portion of the TPFDD varied significantly, causing difficulties for both Army and deployment community operations. While some mechanical improvements are called for (more trained and experienced Army JOPES [Joint Operations Planning Execution' System] operators), it is essential to face the fact that the details demanded in the TPFDD for contingency operations are inherently unpredictable. DoD should consider adapting transportation operations to lessen reliance on (and expectation of) detailed TPFDDs. The elimination of false precision in planning could lead to better use of available transportation. However, the process also needs tools to enable deployment planning and execution to allow for coalition forces transportation needs.
- **Determining Logistics Readiness for Deployments.** In humanitarian operations, support capabilities such as civil affairs, medical, engineering, and trucking services become the heart of the Army's mission. The Army may wish to consider establishing "ready groups" for selected support activities. This would add to support costs, but would yield a more robust support posture for both humanitarian and combat contingencies.
- **Assigning Joint Deployment Capabilities.** Restore Hope used six of the nation's best sealift ships, the FSSs. This seriously undercut the ability of the Army's Contingency Corps to deploy on the schedule demanded by the Army Strategic Mobility Plan. Using other smaller and slower ships for humanitarian operations would have a small effect on those operations while retaining the nation's readiness for major contingencies.
- **Adapting Prepositioning Shipping.** Prepositioning at sea can greatly enhance Army early entry capabilities, but the Restore Hope experience was disappointing. Upgrading capabilities for "in stream" offloading will help, as will stow plans that permit more varied offloading sequences. The Army should study these

in the light of potential deployments to areas where facilities are poor or the weather and sea state unfavorable.

- **Monitoring Higher-Level Mission Accomplishment.** Judging from the material reviewed in preparing this report, little top-level Army attention was given to defining measurable short-term or long-term objectives for understanding how well the humanitarian mission laid out by the President was going. Most military reporting monitored traditional military concerns: troop levels, equipment readiness, projected military operations, etc. The media told the public what was being accomplished; military reporting omitted even the simplest measures such as the volume of food shipments escorted to relief centers. The Army missed an important opportunity to tell the public and their representatives that it had contributed importantly to improving security and ending starvation in Somalia.

ACKNOWLEDGMENTS

A great many Department of Defense personnel contributed information and insights to the analysis presented here. Major Rick Brennan, on the staff of the Deputy Chief of Staff/Operations, served as the primary point of contact, raising issues and identifying contacts. Organizations visited and the individuals there who arranged interviews, shared data, and described their roles and the problems they confronted include:

ARCENT (G-3)	COL Lewis Bishop COL William Rice
ARCENT (G-4)	COL Randy Helm LTC Robert Dement
DCS (Operations)	LTC Ken Hewitt
DCS (Logistics)	COL William Crowder
7th Transportation Group	MAJ Mike Boyle
10th Mountain Division	Mr. Marlyn Sears
Military Traffic Management Command	Maj John Hibshman Mr. Len Priber
U.S. TRANSCOM	Mr. Dave McDonough
Air Mobility Command	LtCol. Robert Schumacher

At each organization, many more individuals than those listed generously contributed time and access to relevant data and records. Several of the listed organizations also provided helpful comments on an early draft of the report. The broad overview attempted here of the diverse work of dozens of organizations and thousands of individuals would not be possible without such open and active assistance.

Among my RAND colleagues, Myron Hura, Mary Morris, and Marc Robbins reviewed earlier drafts and briefings of this work.

The author is, of course, responsible for any errors of fact and interpretation remaining in this analysis.

GLOSSARY

A/DACG	Arrival/Departure Air Control Group
AMC	Air Mobility Command
ARCENT	Army Component of a Joint task force
ARFOR	Army Force
CENTCOM	United States Central Command
CINC	Commander in Chief
CINCPAC	Commander in Chief, U.S. Pacific Command
CONUS	Continental United States
CRAF	Civil Reserve Air Fleet
CS/CSS	Combat Support/Combat Service Support
D-day	The day an operation is implemented (December 9 for Restore Hope)
DLA	Defense Logistics Agency
DSN	Defense Switch Network
FSS	Fast Sealift Ship
HHC	Headquarters Company
HMMWV	High Mobility Multi-purpose Wheeled Vehicle
JOPES	Joint Operations Planning and Execution System
JTF-S	Joint Task Force–Somalia
LAR	Logistics Assistance Representative
LASH	Lighter Aboard Ship
MEB	Marine Expeditionary Brigade
MEF	Marine Expeditionary Force
MEU	Marine Expeditionary Unit
MOG	Maximum on the Ground
MPS	Maritime Prepositioning Ship
MRE	Meal—Ready to Eat
MSC	Military Sealift Command

MTMC	Military Traffic Management Command
RRF	Ready Reserve Fleet
SOF	Special Operations Forces
Stons	Short tons
TACC	Tanker Airlift Control Center
TPFDD	Time Phased Force Deployment Data
USAREUR	U.S. Army Europe
USTRANSCOM	United States Transportation Command
WWMCCS	Worldwide Military Command and Control System

Chapter One

DEPLOYMENT OF ARMY FORCES

INTRODUCTION

By the time the first U.S. military unit—a Seal team—landed at Mogadishu on December 9, 1992, the main outline of U.S. deployments to Somalia was known to the participants and to the public. The President had announced the deployments five days earlier. The Joint Task Force (JTF) and its leader had been identified. Major General Arnold had been named as the Commander of the Army force (ARFOR) component within the JTF. The Air Force had begun to put key elements of an airlift system in place and knew that tactical fighter squadrons would not be needed. The Navy knew that SeaBee units would be sent and understood that naval forces already deployed off Mogadishu would be sufficient. The Marine Corps knew that the deployed Marines of the 15th Marine Expeditionary Unit (MEU) would be the first to land and that the 7th Marine Expeditionary Brigade (MEB) of I Marine Expeditionary Force (MEF) would be sent. The Army knew that the 10th Mountain Division would provide a brigade of light infantry. And finally, the size and composition of the Army support forces (engineers, civil affairs, military police, transportation, medical, signal, and more) were being developed.

Considering the size of Operation Restore Hope and the amount of time available to plan the operation, it might be anticipated that deployments would go smoothly. In large part they did. Personnel and equipment flowed quickly into Somalia, overcoming the problems created by the devastated infrastructure there. In the large, Opera-

tion Restore Hope went off according to plan. There was little opposition to U.S. and UN operations and the transition to UN leadership took place on May 4.

Yet many participants speak about difficulties in planning, coordinating, and managing the operation. Although the general outline of the deployments was known, detailed plans were not available. Also, the implications of Somalia's ruined infrastructure were not yet fully appreciated. In spite of such problems, the nature of the Somalia operation (humanitarian, rather than combat) and the relatively small scale of the deployment (about five percent of the personnel sent to Saudi Arabia during Desert Shield) provided the slack that allowed the basic deployments to be accomplished without serious problems. Restore Hope was not conducted as an emergency deployment.

This report reviews the performance of Department of Defense (DoD) deployment systems in moving Army forces into Somalia and sustaining them while they were there. After a brief description of the situation as it pertains to the transportation and sustainment of Army forces, the planning and coordination of Restore Hope deployment operations are summarized. The performance of the major deployment modes (airlift, sealift, and prepositioning) is reviewed and compared, where possible, with planning estimates. The discussion ends with some general observations on five major issues that are pertinent to posturing the Army for more effective deployments in future humanitarian operations.

Ideally, Restore Hope deployment performance should be compared with planning or expectations at the start of the operation. However, there are no special standards or planning factors for humanitarian deployments. Planning factors for ship and aircraft availability, loading times, payloads, speeds, and unloading times do not depend on the type of mission being conducted. Here, realized deployments are compared with expectations based on available deployment planning factors. Where possible, a second comparison modifies the planning factor estimates to allow for the effects of limited port and airfield capacities. Since port capacities were the effective constraint on Restore Hope deployments, these provide a more appropriate standard.

BASIC CONSIDERATIONS

Deployment planning and operations are necessarily conditioned by some basic considerations. What is the mission? What are the objectives? What are the forces to be deployed and when will they be ready to move? Where are they going? What resources will be available for the deployment operation? What cooperation by other nations will be needed? What coalition support will be provided?

In general terms, the United States envisioned employing approximately 28,000 active duty personnel and their equipment—mostly light ground forces—to Somalia.[1] The availability and positioning of the units and their equipment varied. Afloat Marine Corps forces of the 15th MEU (numbering about 1800 personnel) were in the area of Mogadishu on December 2 and were prepared for the initial landing, supported by naval forces that included the aircraft carrier *Ranger*. The Marines also had the equipment for a notional 16,000-man Marine Expeditionary Brigade prepositioned aboard ships near Diego Garcia. Use of this unit required the airlift of Marine Corps personnel and additional equipment from California. Although military participation by several allies was anticipated, the type and amount of transportation and logistics support they would need from the United States was not at all clear.

The Army had some supplies and equipment prepositioned aboard ships near Diego Garcia. But the bulk of the Army force, both in people and equipment, was expected to come from units located in the eastern half of the continental United States (CONUS). Both sealift for equipment and airlift for personnel and some equipment would be needed to deploy Army forces.

Figure 1 shows the general scheme of the deployment operations. Since there were no other major deployments under way, a high proportion of DoD's transportation was potentially available for Restore Hope. Ships prepositioned at Diego Garcia were some 2000 nautical

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[1]This was the goal given at the time deployment operations began. Earlier planning within the Army had considered far higher personnel deployments for the Army alone. Personnel ceilings (or "caps") were used by top-level planners to control the size of the deployment. The size of the cap on the Army deployments was negotiated by the Army. On D-day (December 9), the cap on the ARFOR was just under 15,400.

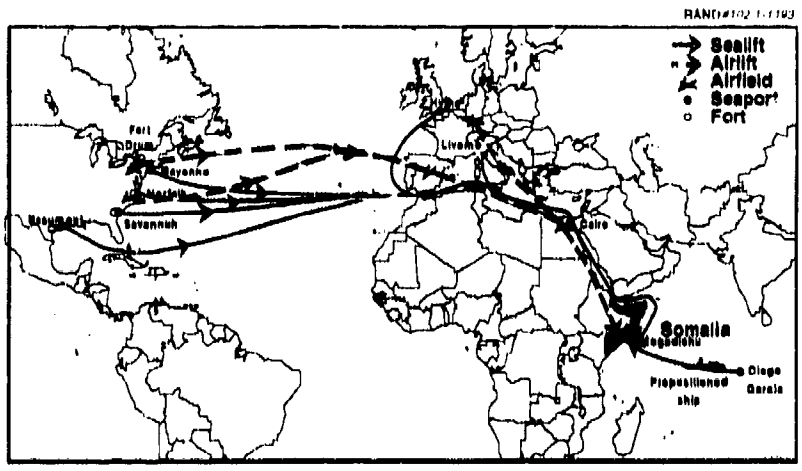

Figure 1—Army Deployments Used Airlift, Sealift, and Prepositioned Ships

miles from Mogadishu, about four sailing days. Army equipment to be shipped from CONUS was loaded at ports at Bayonne, Norfolk, Savannah, and Beaumont. Shipping distances (via the Suez Canal) ranged from 7600 nautical miles (from Bayonne) to 9150 nautical miles (from Beaumont). Depending on ship type and sea state, these voyages could require 12-1/2 days (Fast Sealift Ships [FSSs] from Bayonne in good weather) to 20 or more days (if FSSs from Beaumont encountered severe weather).

Personnel and some equipment would be flown from CONUS and Europe to Somalia. The air distance is 8044 miles from the East Coast (from Griffiss Air Force Base) and 10,439 from the West Coast (March AFB). The air deployments would fly over various European (Spain, Portugal, Italy, Greece, Germany) and African (Egypt, Djibouti) nations. The airlift would also need en-route bases to support aerial refuelers and airlift aircraft. Airbases at Lajes in the Azores and Moron in Spain supported much of the aerial refueling activity. Figure 1 shows just one of the several potential routes that airlifters might take between CONUS and Somalia.

Planners recognized the there would be no host nation support at the destination in Somalia. They knew that the most basic facilities

and services such as water and electricity would not be available.[2] In fact, in Operation Provide Relief, U.S. C-130 airlifters had been flying relief missions into Somalia from airfields in Kenya since August.[3] So information on the quantity and quality of facilities in Somalia was available, at least to some of the planners preparing for Restore Hope deployments. Airlift planners understood that all needed ground support (lighting, traffic control, materiel handling, etc.) would have to be deployed. Sealift planners appreciated that ships with drafts greater than 30 to 32 feet might not be able to enter Somali ports. A load limit of 7000 long tons was imposed on the FSSs so they could enter Mogadishu's seaport. The sealift planners knew that an on-scene survey of the port would be necessary to establish just what port capabilities were. In short, planners understood that essentially all the deployment infrastructure needed would have to be deployed. Nevertheless, it is doubtful that all deployers and operators fully understood all of the implications of the devastated Somali facilities.

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[2]General Fogleman, Commander of the U.S. Transportation Command, put it this way, "We understood clearly that it was a country with absolutely no infrastructure." See his speech to the Air Force Association published in *Vital Speeches of the Day*.

[3]The first delivery—34 tons—was made August 28.

Chapter Two

DEPLOYMENT PLANNING

It is difficult to pinpoint exactly when detailed planning for Restore Hope deployments began, but the third week in November is a reasonable guess. President Bush reportedly told the Acting Secretary of State on November 14 to do "whatever was necessary working through the UN to stop the starvation in Somalia."[1] The possibility of U.S. force deployments to Somalia had been discussed in the press for weeks. The diplomatic buildup to the deployment was deliberate and open. After several days of discussion and debate, the United Nations Security Council approved—on December 3—a military intervention led by the United States. President Bush announced the U.S. force deployments the next day. By that time most of the DoD organizations to be involved had organized for crisis operations.

Although deployment planners were uncertain about many of the details of Restore Hope operations, they were aware of four broad factors. The general nature of the mission was to be humanitarian, not combat. President Bush had made it clear that Restore Hope military deployments had two purposes: to create a secure environment so that civilian relief organizations could operate freely and to prepare the way for a United Nations peacekeeping force. The general size of the deployments contemplated was generally understood. Third, planners should have been well informed about the poor quality of the facilities in Somalia. Finally, they knew the time of the

[1]Quoted in an unpublished manuscript by Andrew Natsios (dated May 12, 1993) that deals with humanitarian crises in general and Somalia specifically.

year, allowing them to anticipate likely weather conditions in the United States and Somalia.

However, the details of the mission were nebulous and the amount of armed opposition was uncertain. Many authorities felt the lack of a "definitive" mission statement. Initial planning, based on securing an array of feeding sites while providing the capability to overcome large-scale opposition, generated requirements for substantial forces. By late November, Washington had set a cap of 30,000 U.S. personnel for Restore Hope. The rationale for the cap was not apparent to many participants, who thus considered it arbitrary and imprudent from a military point of view. Certainly the Army was prepared to support larger deployments.

Military leaders began to organize operations early in December. Warning orders started to flow to selected units. Top-level Army officials started to get regular briefings on Restore Hope on December 1, and the Army crisis response cell was activated on December 2. The U.S. Transportation Command (USTRANSCOM) Headquarters set up a dedicated operations center on December 4. At the Air Mobility Command (AMC), the Tanker Airlift Control Center (TACC) initiated Restore Hope planning and reporting on December 3. The Military Sealift Command (MSC) began to ready shipping for deployment operations. The Military Traffic Management Command (MTMC) activated its operations center for Restore Hope on December 4.

The 10th Mountain Division was identified as the source of the major Army combat force to be deployed. Preliminary planning by the division (as ARFOR commander) began December 1, but exactly which parts of the division would deploy and when was not defined that early. During the first week in December, the Army trimmed its initial plans (then envisioning deployments approaching 20,000 soldiers) to meet troop ceilings imposed from above. By D-day, the planning envisioned sending about 5000 troops from the 10th Mountain Division and some 8000 Army logistics personnel as well as nearly 14,000 Marines. Planners were concerned with water and food supplies, airfield and seaport status and operations, distribution of military materiel to U.S. forces in Somalia, medical support, rules of engagement, foreign participants, and overflight rights. They were considering deploying some Army capabilities (helicopters and wa-

tercraft) from Europe. The requirements for various sorts of supporting logistics units (medical, transportation, engineering, signal, military police, quartermaster, maintenance, etc.) were being identified and sourced.

The general missions and concepts for the operation had taken shape in early December, and the Joint Task Force–Somalia (JTF-S) organization was set.[2] The objectives of JTF–S military operations would be to secure ports, airfields, and major humanitarian relief centers, to provide a secure environment so relief operations by the UN and other nongovernment organizations could proceed, and to disarm potential troublemakers only as necessary to permit relief operations. The operational concept assumed a multinational joint and combined force. U.S. Marine forces would first secure base facilities at Mogadishu and then deploying Army and Marine forces would move out to protect famine and relief centers and the roads leading to them. In the final phase of the operation, U.S. forces would turn the responsibility for the operation over to United Nations forces. In short, the intent was to assist relief operations by ensuring uninhibited movement of relief supplies over ground routes within Somalia. At the same time, military operations would be carefully planned and methodically conducted so as to minimize the risk of casualties. U.S. deployments were sized to "dominate" the area. When announcing the deployments, Secretary of Defense Cheney said that U.S. commanders would "take whatever action is necessary to safeguard the lives of our troops and the lives of Somalia's people."

Transportation planners began to ready their operations in early December.[3] The Army began to assemble rail cars at Fort Drum early in December. Since it was clear that some shipping would have to be activated, USTRANSCOM took measures to ready three of the six available Fast Sealift Ships (two more were in shipyards). Two tug boats were chartered and were sent to Mogadishu. AMC began to put the airlift system for Restore Hope into place. Air Force ground

[2]The deputy JTF commander and the logistics commander (J-4) were Army officers. The JTF STAFF eventually included more then 150 Army personnel.

[3]Political preparations were going forward at the same time. Ambassador Oakley met with leaders of some of the Somali factions in Addis Ababa, and the relief organizations operating in Somalia were informed about impending U.S. operations.

support personnel and equipment began to move toward Somalia as early as December 5. Twelve plane tanker squadrons were deployed to Lajes in the Azores and Moron in Spain to prepare for aerial refueling operations. Other specialized units had also been ordered to begin to move. CINCPAC had directed the Marine Maritime Prepositioning Ships (MPSs) to sail toward Mogadishu. However, none of the Army's prepositioned ships were ordered to begin moving to Somalia before D-day although they carried needed hospital facilities, materiel-handling equipment, and food supplies. This, of course, was not an Army decision. The decision to move the ships was made in Joint channels and reflected Joint priorities.

Chapter Three

DEPLOYMENT COMMAND AND CONTROL

Execution of deployment operations for Restore Hope began on December 7. Movements to position airlift support units had begun even earlier. (For counting purposes, D-day for Restoro Hope is taken as December 9, the date the Marines went ashore at Mogadishu.) The Joint Operations Planning and Execution System (JOPES) was used to exercise command and control over deployment operations. This system is intended to operate from a Time Phased Force Deployment Data (TPFDD) base. The TPFDD, developed by the supported commander (JTF–S) with help from supporting components, identifies, in detail, which units are to be deployed, where they are located, how much cargo and personnel they have, and when they must be delivered to the theater. When the TPFDD is stabilized, deployment planners and operators have a common script to work from. Although it may take as long as 18 months to fully develop a TPFDD in deliberate planning, the result is an efficient plan for using transportation to make a deployment.

In Operation Restore Hope, such a deliberate plan served as the basis for early deployment planning. The TPFDD for Restore Hope was built by the JTF, based on an existing CENTCOM operation plan, during a three-day period. But, as should be expected, that preexisting plan had to be modified and adjusted to reflect the conditions and details of unfolding requirements and events. Data on the availability of forces had to be updated. Needs for forces had to be adjusted. Facilities constraints had to be accommodated. Such changes are inherent in the contrast between an abstract, refined deliberate plan and the specific needs of a crudely understood, ongoing "crisis" deployment.

Many participants complained that the TPFDD for Restore Hope was always changing and that variation in the TPFDD resulted in wasted

lift. Some cargo was loaded at U.S. ports only to be unloaded a short while later at another because it was no longer deemed needed.[1] Some Army equipment shipped to Somalia was never unloaded or used. Some airlift was sent to carry cargo that never appeared. Participants at USTRANSCOM and AMC reported that, at best, the TPFDD was validated for only a few days at a time. Such a short horizon complicates airlift planning and provides little useful information for sealift planning. These observations and complaints echo comments made after other recent deployment operations.

There was no preexisting TPFDD for Restore Hope deployments to Somalia. The TPFDD was built as the operation unfolded. One Army participant reported that the process was hampered by a "major crash" in the Worldwide Military Command and Control System (WWMCCS) early in December.

A TPFDD contains several types of data: identification of units to be moved, the dates the unit will be ready to move, the dates they need to be delivered, the numbers of personnel, and the volumes of equipment. Both the total size of the movement and the details are important to effective deployment operations. In Restore Hope, the real limitation was the number of Army personnel to be allowed into Somalia. That limit—about 13,400—was known as early as D-day. The limitation on Army personnel reduced, but did not eliminate, uncertainty about how much equipment would be deployed. Further, it did not suggest a fixed sequence for the deployment of Army units. It did, however, directly affect the amount of support that could be put in place in Somalia.

A change in any of the unit details is a change in the TPFDD that can affect transportation planning and operations. Changes affect where

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[1]According to the Eastern Area Headquarters of the Military Traffic Management Command:

> At Bayonne, Charleston, and Newport News, ship loading often had to be halted because units in port were deleted from the requirement to deploy, and other units were sent to the port to replace them. In some instances, this led to having to unload unit equipment already stowed aboard the vessel. In other instances, planned full shiploads at Beaumont, Charleston, and Bayonne were reduced to the point that double-porting vessels became necessary to efficiently utilize storage space and minimize delivery delays in Somalia.

(SOURCE: MTMC, Eastern Area, letter to author, 1 September 1993.)

the passengers and cargo will be available, when they will be available, and what the workload will be. Obviously, the impact on transportation operations depends on how long before the planned move the change is made. Differences in the details are important even if the total size of the deployment does not change. A change in the TPFDD 30 days out is generally easier to handle than one just three days hence. Airlift can respond to short-notice changes, but the adaptation usually costs something in airlift system performance. Shipping, however, requires longer stable lead times; ships often cannot respond to changes in a three- to five-day time frame.

What are the facts? The data in Table 1 suggest that the details of the Army portion of detailed deployment plans varied significantly. The table compares Army deployment plans at four-day intervals and shows little consistency. The variation can be seen by reading across the rows in Table 1. For example, on D-day, the Army was planning to move 145 personnel from two units on December 27. By D+8, the plan for December 27 had changed to include three units and 267 soldiers. The Headquarters Company (HHC) of the 10th Division remained in the plan, but the number of personnel to be sent on December 27 had doubled. By D+12, the size of the planned deployment had fallen to 60 personnel and the HHC of the 10th Division had shifted to another date. Then, on D+16 (December 25) the size of the deployment planned for December 27 had grown to 792 personnel, the HHC had reappeared (at an even larger size), and six new units had been added to the list.

Table 1 gives the impression of considerable turbulence in the Army deployment details. A more complete comparison, examining day-to-day changes, again shows considerable turbulence. This, and the evidence in Table 1, taken together with the views of the participants, are sufficient to establish the hypothesis of significant and troublesome variation in the Army portion of joint plans for Restore Hope deployments.

What might have been the problem? Opinions vary. One participant said that the TPFDD came into TRANSCOM "in big pieces and in no particular order," implying a lack of management. Lack of sufficient reliable long-haul communications between the deployed JTF-S and CONUS probably contributed to the JTF-S's problem in fixing the

Table 1

Variation in Army Deployment Plans

Planned Deployment Date	Detailed Army Deployment Plan as of				
	D-day December 9	D+8 December 17	D+12 December 21	D+16 December 25	D+20 December 29
Dec. 19	None	HHC 10 DIV 81 HHC 24 TR BN 15 HHC 2nd BDE 81 96 CA BN 12			
Personnel	0	189			
Dec. 23	HHC 2nd BDE 18	HHC 2nd BDE 18 C/7-158 AV 25 57 TRANS CO 30 68 EVAC HOSP 10	C/7-158 AV 25 B/70 TC 60 HHC 10 DIV 18		
Personnel	18	73	103		
Dec. 27	HHC 10 DIV 100 41 EN BN 45	HHC 10 DIV 210 HHD 548 CSB 16 HHD 62 MED GP 41	HHD 548 CSB 16 HHD 62 MED GP 44	HHC 10 DIV 247 HHD 548 CSB 56 3-17 AIRCAV SQDRN 171 210 FSB 156 546 AG CO 40 59 CH EM CO 80 571-6 SP BN 14 550 ROD 17	
Personnel	145	287	80	792	
Dec. 31	3-14 IN 616 710 MSB 10	HHC 2ND BDE 97 10 FSB 260 10 PSC 40	3-17 CAV SQDRN 31 66 EN CO 16 10 SIG BN 28 ARCENT LNO 24 HHD 720 MP 60 571 MP CO 123	3-17 CAV SQDRN 31 10 SIG BN 28 HHC 10 DIV 210	3-17 CAV SQDRN 31 10 SIG BN 28 HHC 10 DIV 145
Personnel	625	397	382	269	204

TPFDD.[2] Lack of personnel, practice, and "discipline" (in the sense of following precisely the steps and formats of WWMMCS/JOPES) by the supported components in using JOPES reportedly contributed to the problem in Restore Hope, as they did in earlier contingencies. Inaccurate and changing data certainly also contributed. As observed in earlier contingencies, units typically deployed with more equipment than was envisioned by JOPES planning estimates.

Many Army commands, perhaps too many, were involved in providing deployment planning data and directions. The 10th Mountain Division was the ARFOR commander, but it was neither staffed nor equipped to put information into the TPFDD. Data for the division were entered at the XVIII Airborne Corps, Forces Command, and ARCENT (the Army component of the JTF). Inevitably, there were coordination delays, confusion, and duplication of work within the Army.

However, the variations displayed in Table 1 cannot be solely explained by system training, organization, and management problems. And, to say as some participants did that the JTF simply did not know what was wanted is merely another way of observing that the TPFDD varied. A number of participants pointed out that "political considerations" caused TPFDD changes. The details of the deployment, which were constantly shifting, had to be continuously examined for "transportation feasibility."

Because airlift capacity was changing, what was feasible one day might not have been a few days earlier or later. Moreover, the majority of the Army airlift originated at Griffiss Air Force Base in upstate New York. Winter weather led to some delays in airlift operations. It is easy to imagine how the effects of capacity changes and weather conditions initiated changes that cascaded through the remaining days of the TPFDD.

Other problems also led to changes in the Army deployment plan. For example, the inability to offload hospital equipment from afloat prepositioning ships led to an unplanned requirement to fly the

[2]Worldwide Military Command and Control System (WWMCCS) capability was not available in Somalia until about January 1. (U.S. Army, Center for Army Lessons Learned.)

needed facilities from CONUS. This required the insertion of ten C-5 and one C-141 missions into the flow. The same delay in unloading Lighter-Aboard-Ship (LASH) vessels led to a shortfall in MRE (Meal Ready to Eat) provisions; this was overcome by airlifting the needed supplies from Kuwait. Given the limited airfield capacity at Mogadishu, other cargo had to be displaced from the airflow to accommodate the hospital facilities and the meals.

As the JTF gained experience, the staff was able to assess the tactical situation and refine and reduce requirements for equipment and personnel. Experience on the ground in Somalia led to "reality changes" in the types or numbers of units needed. As one officer put it, "the expected tempo of operations never materialized." Opposition was minimal until well after the initial Army deployments were completed. Some planning foresaw that the United States would provide logistic support for coalition forces. In the event, many coalition units took care of their own logistical needs. The TPFDD was given a careful scrub late in December and reductions were made to planned deployments. As a consequence, some units and personnel were dropped from the airflow and other units and personnel moved forward to earlier dates.

Finally, deployment of coalition forces competed for scarce resources. Airlift of coalition units required landing "slots" and associated ground support in Somalia. And, in some cases, AMC provided aircraft for transporting coalition forces to Somalia. The requirements for transporting the forces of coalition partners were mostly handled outside normal command and control channels. Nonetheless, changes in allied plans directly affected U.S. deployment operations. In future coalition operations, U.S. planners must be prepared to estimate the transportation requirements of allies and allow for them in planning U.S. deployment operations.

USTRANSCOM will assign transportation only to U.S. force moves that have been validated by the supported commander in chief (CINC). TRANSCOM does not view itself as a wholesale supplier of transportation with the particular cargoes to be carried at the discretion of the user, even if the user is the supported CINC. As long as USTRANSCOM is held accountable for control of and visibility into ongoing movements (by users and by higher authorities), their need for specific TPFDD data to plan and manage transportation is obvi-

ous. Nonetheless, when lift operations are relatively small (and lift capacity is not constraining), the occasional short-term "waste" of transportation can be absorbed.

The variation in deployment details experienced in Restore Hope is not atypical. Participants in Desert Shield deployment operations identified TPFDD variations as a problem in 1990. The problem is not in the TPFDD per se, but in the necessity for it to react to and capture the complex effects of the supported CINC's rapidly changing transportation needs. Such changes are likely to characterize future contingency deployments regardless of how carefully deliberate plans have been constructed. On-the-shelf TPFDDs for every possible contingency are not the answer. The deployment community and the services need to identify a method of organizing and coordinating deployments that mitigates and controls the effects of the many factors that influence the "real" flow into the theater.

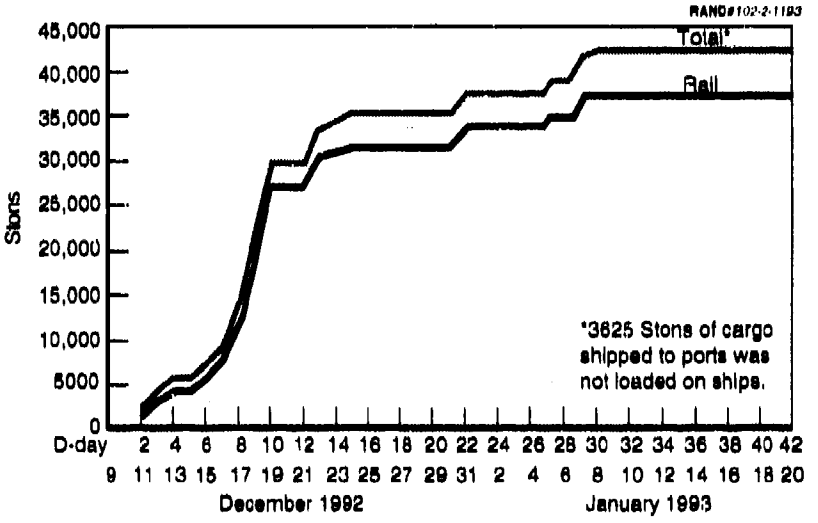
Chapter Four

MOVEMENT TO PORTS

Except for the effects of winter weather, the movement to ports and airfields was generally smooth.[1] In all, MTMC reports using 341 truck loads and 1245 rail car loads in moving materiel to CONUS ports for deployment. The cargo came from Fort Drum, Fort Benning, Fort Hood, Fort Stewart, Fort Huachuca, and several other installations. By January 20, MTMC had shipped nearly 43,000 tons of deployment cargo in CONUS, 88 percent by rail. As Figure 2 shows, the movement was initially quite rapid. Nearly 30,000 tons were shipped to CONUS seaports in the first ten days. The total movement was completed in 30 days. Apart from weather, there were no reports of problems during deployment operations in CONUS. Army cargo was shipped from six CONUS ports with the bulk (95 percent) loaded at Bayonne, Beaumont, Savannah, and Newport News.

The equipment of the 10th Mountain Division moved to Bayonne in a series of six trains. The first of these left Fort Drum in upstate New York the afternoon of December 10 (D+1), arrived at Bayonne midday on December 11, and was fully unloaded by 9:00 a.m. the next

[1]General Hansford Johnson, former commander of USTRANSCOM, has pointed out that the United States plans transportation as if the weather is always good. "Unfortunately, we had planned on perfect weather. We as in a large 'we.' Our country. And the weather ended up being a controlling factor." (*General Hansford T. Johnson: An Oral History*, Office of History, U.S. Transportation Command, December 1992.) In fact, bad weather interfered with transportation support for Just Cause and Desert Shield. During Restore Hope, winter storms affected road, rail, and airlift operations in CONUS.



SOURCE: MTMC.

Figure 2—Movements to CONUS Seaports Completed in 30 Days

day. The trains varied in size from 54 to 82 cars and took, on the average, about 24 hours to make the 360-mile trip from Fort Drum to Bayonne.[2] Apparently, rail-loading facilities at the Fort and rail access to the base were not problems. Personnel and some equipment from the 10th Division were airlifted to Somalia from Griffiss Air Force Base, located about 75 miles from Fort Drum. Although the December weather was at times harsh, it did not stop rail movement.[3]

USAREUR aviation units deployed CH-47 and UH-60 helicopters and 650 personnel to Somalia. Part of the movement was made by airlift

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[2]Although this works out to an unimpressive 15 miles per hour (well below the modest 22 mph planning factor for unit trains), as Figure 2 shows, most Army cargo was rapidly delivered to the designated seaport for loading. It does not appear the 15 mph rail movement rate had any measurable effect on the speed of Restore Hope force closures in Somalia.

[3]Early on, Fort Drum sent cargo by rail to Bayonne before receiving a validated port call from MTMC, so that the FSS *Pollux* could be rapidly loaded.

directly from Germany, but parts of the aviation units were to be transported by ship from Livorno, Italy. The first helicopters "self-deployed," arriving at Livorno on December 15. The first train left from Germany for Livorno the same day with an expected 42-hour transit. When the necessary clearances from the Italian government were slow in coming, the unit stopped in France and some of the unit was flown from French airfields.[4] The main body of the USAREUR aviation support was eventually moved to Italy in eight trains and loaded aboard ship in Livorno.

Most sustainment cargo—amounting to 3150 tons—moved via commercial carriers to commercial container ports in CONUS for shipping.

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[4]The Italian government was using the Port of Livorno and its staging area for shipping Italian units to Somalia.

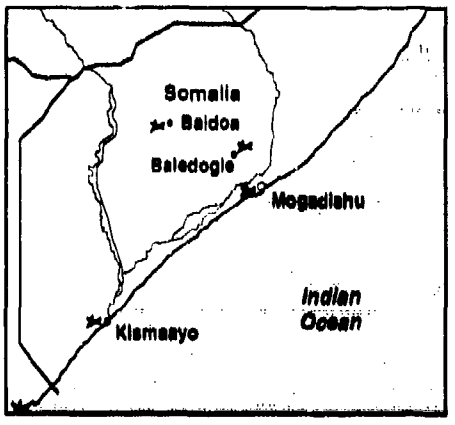
Chapter Five

AIRLIFT OPERATIONS

AMC had several elements of the airlift system in place before D-day. Since AMC had been involved in ongoing Provide Relief operations based in nearby Kenya, personnel and equipment could be positioned close to Somalia (at Mombasa and Diego Garcia) before U.S. forces had secured airfields there. The airlift operations concept was to make extensive use of aerial refueling en route to Somalia, and, since fuel was not available at Mogadishu, to stage the aircraft to another location for refueling. At the outset of Restore Hope, Army planners considered the four airfields identified in Figure 3.[1] These airfields were known to be in poor shape and their very limited capacity (or "maximum on the ground" [MOG]) was expected to be the major constraint on air deliveries.

Had airfield capacities not limited deliveries, an all-out effort by AMC (including Civil Reserve Air Fleet [CRAF] I and II) could have delivered at least 2100 tons of cargo a day into Somalia or, allowing a few days to build up to this rate, about 85,000 tons in 42 days. This estimate assumes that all cargo would be airlifted from the East Coast. It also assumes planning factors based on Operation Desert Shield/Storm experience, no aerial refueling, and no limitations due to airfield conditions in Somalia or en route. The fact is tha airfield conditions in Somalia did limit deliveries, so that actual deliveries in the first six weeks were less than 30 percent of the estimated 85,000 tons.

[1] Baidoa was not able to handle intertheater airlifters, although it could be used by C-130s for intratheater airlift deliveries. Other airfields in Somalia—at Bardera, Belet Uen, Garoe, Gialalassi, Oddur, and Waajid—were also unable to accommodate C-5s and C-141s.



Airfield	Maximum on ground
Mogadishu	3 C-141 or 2 C-141 + 1 C-5
Baledogle	1 C-141
Kismaayo	3 C-141
Baidoa	1 C-130

Figure 3—Airfield Capacity Was Small

AMC data summarizing the daily airlift effort over the first six weeks is displayed in Figure 4. Cargo deliveries are presented in the top panel and passenger deliveries in the lower panel. AMC also supplied estimates of cargo and passenger delivery capacities, which are largely determined by the availability of airfields and their conditions (runway lengths and strengths, aircraft parking space, hours of operation, etc.) in Somalia. Capacity built up to a maximum of 905 tons per day and 1105 passengers per day between December 16 and 25, the period when the Baledogle field was usable by C-141s. (Kismaayu was not secured until late in December and then could be used only to serve forces in southern Somalia.) As can be seen from the figures, actual deliveries sometimes exceeded estimated capacities.[2] Peak deliveries of passengers and cargo occurred when Baledogle was in use.[3] Figure 4 also suggests greater variation in passenger deliveries than in cargo loads.

[2]This could have occurred if AMC anticipated that capacity could be exceeded, perhaps by a combination of faster aircraft offloading times and higher payloads per aircraft. Alternatively, the AMC capacity estimate may have been conservative.

[3]The U.S. military population in Somalia reportedly peaked at just under 25,000 late in January.

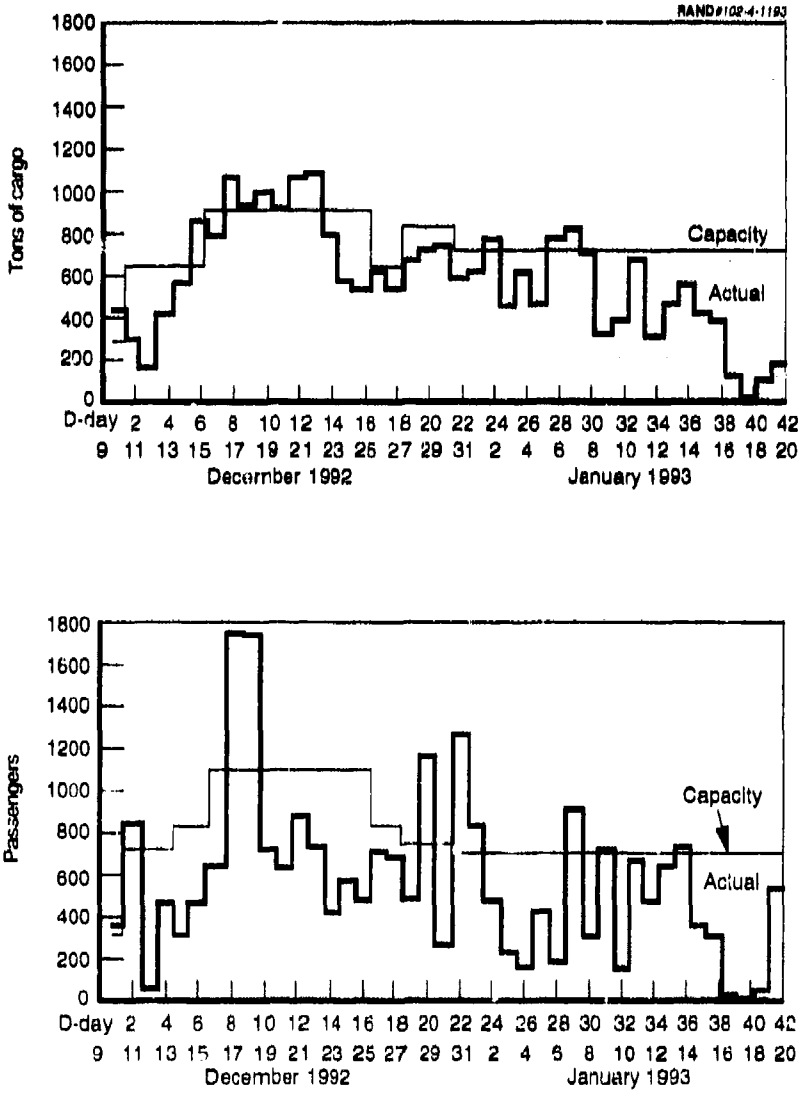


Figure 4—Daily Airlift Deliveries to Somalia

Airlift operations were constrained by the ground facilities in Somalia. It was necessary to meter airlift into slots in Somalia at a rate that the facilities and personnel there could support. Airlift planners worked backward from the capacity constraint and attempted to schedule airlift so as to maximize the use of the available airfields. For example, for a short period Baledogle was available only for daylight operations. Airlift was scheduled so that the first planes arrived at dawn, with subsequent arrivals following at intervals determined by the expected turnaround (offloading and takeoff) times. This process implied discipline at every stage in the airlift system. Since flight times to Somalia experienced relatively little variation, aircraft departures could be timed to match the required aircraft arrival schedules. That meant that cargo had to be ready to load at a fixed time as well. Reportedly, some missions departed for Somalia rather lightly loaded because the component's cargo had not been ready for loading and the airlift system discipline required a timely departure.

Figure 5 presents the same data in cumulative form. Cargo deliveries track capacity closely for the first three weeks of the operation, using some 90 percent of cumulative capacity. Air deliveries of cargo then fall off gradually and amount to only 78 percent of capacity at D+42. Actual passenger deliveries amounted to only 75 percent of AMC's estimated capacity during the first three weeks and 71 percent at D+42. These figures suggest that while airfield capacity may have limited deployments to Somalia during December, there was unused airlift capacity beginning in early January.

In all, AMC delivered 24,500 tons of cargo and approximately 24,000 passengers to Somalia during the first six weeks of Operation Restore Hope. By comparison, the total effort was between an quarter and a third of the size of the airlift deliveries during the first six weeks of Desert Shield.

AIRLIFT FOR UNITS

Available data do not show the breakdown of airlifted cargo by the airlift user (service, Joint, or resupply) nor by the type of airlifter employed (C-141, C-5, KC-10, or civilian). Thus, the Army share of airlift must be estimated.

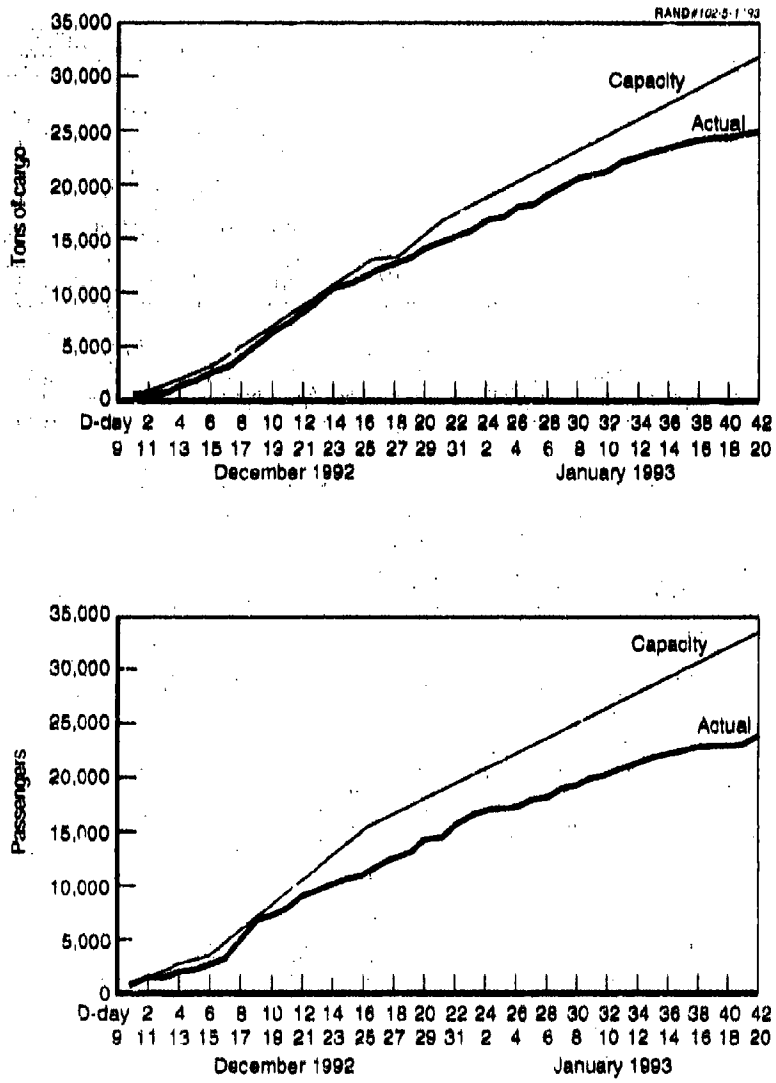


Figure 5—Cumulative Airlift Deliveries to Somalia

Data available from the Army show that Army personnel and cargo were deployed to Somalia from at least 19 CONUS installations and additional locations in Europe. As of January 4, there had been 169 Army airlift missions from CONUS and 20 from Europe. About 60 percent of the CONUS missions carried cargo and personnel from Fort Drum, the home of the 10th Mountain Division. Another four installations (Bragg, Campbell, Eustis, and Lee) provided the workload for 40 airlift missions, with the remaining 29 spread over a dozen installations.

The Army buildup was slow, at least compared to early expectations. Initially, personnel at Fort Drum expected that the 10th Mountain Division would be allocated as many as 24 to 28 airlift missions a day.[4] At that rate, the planned deployments from Fort Drum would have been completed as early as December 20. In fact, as of December 22, there were only a little over 1000 soldiers from the division in Somalia. Airlift had delivered about 120 High Mobility Multi-purpose Wheeled Vehicles (HMMWVs), 60 trailers, and some 25 tons of other 10th Division cargo. The planned airlift rate had fallen to 12 a day. By January 9, the last aircraft carrying personnel from the 10th Mountain Division departed for Somalia. By that time, 127 airlift missions from Griffiss had delivered 3976 soldiers, 281 wheeled vehicles, 129 trailers, 4 helicopters, and 181 pallets for the 10th Division. The last of the division's sealifted equipment did not arrive until early in February.

A rough estimate of Army personnel airlifted to Somalia can be derived by adding the size of the ARFOR, the Army Special Operations Forces (SOF) deployed, and Army personnel in the Joint Task Force

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[4]Note that the 10th Mountain Division had deployed to Florida in early September for relief operations in the wake of hurricane Andrew. The division sent 5000 soldiers and more than 8000 tons of their equipment to Florida, mostly by air. The division used 259 airlift missions over just 11 days. (See U.S. Army, 10th Mountain Division, *Deployment Briefing*, 6 April 1993.) At that rate, the equipment sent to Somalia could have been delivered in five to ten days.

But circumstances for the Somalia deployment were far different. Distances to Somalia were far greater and facilities far poorer there. More important, the operational concept was to ship the bulk of the Army equipment by sea, imposing a two to three week delay in the requirement airlift for personnel. Under the concept, early airlift was available to carry Marines to marry up with their early arriving prepositioned equipment.

Support Command. This yields an estimate that Army personnel were about 37 percent of total passenger deployments to Somalia as of mid-January. A second estimate can be made from the records of the 870th Transportation Company, which ran the Arrival/Departure Air Control Group (A/DACG) at the Mogadishu airport. The Group reports processing 9241 passengers as of January 20, or 39 percent of the total passenger deliveries reported by AMC.[5] A similar comparison for cargo deliveries results in an estimate that Army cargo deliveries by air were 25 percent of the total.

Airlift operations were complicated by several factors beyond the poor condition of airfields in Somalia. One was the need to support coalition airlift activity. AMC airlift was assigned missions such as transporting a Swedish hospital, moving Zimbabwe forces, and providing similar services to other nations. Still other coalition members provided their own airlift, adding to the competition for landing slots, ground space, and other support. A steady flow of VIP visitors had to be accommodated. The variations in TPFDD described earlier undoubtedly complicated airlift planning. Poor communications restricted the notification given to personnel in Somalia. In many cases, ground personnel got little or no advance notification of the units aboard arriving aircraft even though the information was available from JOPES. (In December, communications with Somalia were limited to the Defense Switch Network [DSN]; WWMCCS was not operational in Somalia until January 1. As a result, JTF-S initially had difficulty getting airlift and sealift movement reports.)

SUSTAINMENT AIRLIFT

AMC began sustainment flights to Somalia on December 27. These flights, originating at Dover and Travis AFBs, were reportedly restricted to three a week. The ARFOR in Somalia was allocated 40 percent of the capacity on flights from Dover and 30 percent on those originating at Travis. Sustainment cargo volumes are included in the

[5]In the 30 days following January 20, the A/DACG processed another 1600 passengers. All data include an unknown (but small) number of departing personnel as well as an unknown number of other service personnel who arrived on missions the A/DACG handled.

cargo volumes shown in Figures 4 and 5. As of January 13 (D+35), AMC had delivered only 287 tons of sustainment cargo and 21 tons of mail. Clearly, unit movements dominated the use of airlift capacity.

Chapter Six

PREPOSITIONING

The Army normally has three shiploads of materiel and equipment prepositioned aboard ships stationed at Diego Garcia. The cargo includes ammunition, food, tents, electricity generators, water production gear, watercraft, materiel handling equipment, and hospital equipment, all of the sorts that were needed in Somalia. However, one of the ships, the *American Cormorant*, which carries the watercraft, was in the shipyard in Hamburg, Germany, early in December. The other two had received orders to move toward Somalia but, at D-day, they were still at Diego Garcia.[1] These two ships—the *Green Harbor* and the *Green Valley*, both LASH designs—sailed on D+1 and reached Mogadishu four days later. Apparently, their cargoes were not needed earlier.

The draft of the LASH vessels was too great to allow them to enter the port of Mogadishu. That fact was certainly known by sealift operators, but the implications were not fully appreciated. Normally, the inability to enter the port would have not been a problem for the ships are designed to offload their lighters (barges) "in the stream," so only the lighters need go into port. However, high sea states made this a difficult operation with risks to personnel as well as to cargo. Also, there was too little sheltered space inside the port for the lighters to offload; what little there was was taken up by ships un-

[1] Under Commander in Chief Pacific (CINCPAC) orders, at least two of the USMC MPSs had apparently departed Diego Garcia earlier. Two of the MPSs were reported in the Mogadishu area on D+2, and one, the *Lummus*, which had been assigned to the 15th MEU, began offloading immediately.

loading.[2] Finally, the needed cargo was stowed in difficult-to-reach positions within the ships.

On December 21, the *Green Valley* was sent to Mombasa to transfer needed cargo to the Maritime Prepositioning Ship *Lummus*, which had earlier unloaded at Mogadishu. However, the Mombasa port authorities denied entry to the *Green Valley* on the grounds that the length of the ship could not be accommodated, so the ship could not be discharged there either. The *Green Harbor* was ordered to Kismaayu on January 1, but weather and the sea state there prevented unloading as they had at Mogadishu.[3]

The decision was made to send the ships back to Diego Garcia to offload munitions and ballast until the ships were light enough to enter Mogadishu's harbor. The *Green Valley* and the *Green Harbor* returned to Diego Garcia on January 11 and 12. By that time, the plan had been changed again: the cargo would be transferred to other ships. Containers of MREs were transferred to a commercial container ship and were unloaded in Mogadishu by January 24. Then, late in January an FSS, the *Bellatrix*, was sent to Diego Garcia to pick up additional needed items and deliver them to Mogadishu. The *Bellatrix* arrived at Diego Garcia on February 2, loaded the cargo in two days, and sailed on the 4th. Sailing at economical speeds, the *Bellatrix* eventually made port at Mogadishu on February 15.

Even before D-day, the *American Cormorant* was out of the shipyard and moved to Hythe, England, where her cargo was stored. She reloaded watercraft, small tugs, and a water-producing barge and sailed for Somalia on December 12, carrying a surge group of 40 soldiers from the 7th Transportation Group. She reached the Mogadishu area on December 31 and encountered offloading difficulties resulting from local sea conditions. On January 8, she sailed to Mombasa and began to offload lighterage. Two LCU-200s made the

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[2]Better intelligence about seaport limitations and seasonal weather conditions at Mogadishu (and Mombasa) might have led to more rapid decisions on the redirection of the prepositioning ships.

[3]Under different military circumstances, there would have been no delays in offloading prepositioned LASH ships. Both the *Green Harbor* and *Green Valley* would have been promptly unloaded if there had been major fighting. In war, the on-scene commanders would likely have accepted the risks of injury to personnel and of loss of cargo that were created by the sea state off Mogadishu.

first deliveries to Kismaayu on the 10th and to Mogadishu on the 12th.

Army prepositioning ship performance was unsatisfactory, tolerable only in the context of the Restore Hope mission. Needed Army supplies and equipment that, under the best of conditions, might have been delivered in the first week were not offloaded until much later.[4] The earliest deliveries came at D+34, the latest at D+68. Clearly, there is room for improvement in Army afloat prepositioning planning and operations.[5]

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[4]The LASH ships and the *American Cormorant* should not be confused with new Army programs to preposition the equipment for an armored brigade and associated engineering, transportation, and other support forces. The new programs will preposition unit equipment and some supplies aboard roll-on/roll-off ships that will normally enter ports to unload. Although there is some specialized support equipment loaded on the LASH ships and the *American Cormorant*, there is no combat unit equipment. The bulk of their cargoes is munitions and other consumables. And, as the text notes, these ships need not enter ports to unload. Both types of ships offer the advantages of mobile storage for substantial cargo and the capability to move toward potential contingencies before full-scale deployments are started.

[5]In contrast, Marine Corps operations went smoothly by all reports. The MPSs started for Mogadishu before the execute order was received and the first ship completed offloading on December 16 (D+7).

Chapter Seven

SEALIFT OPERATIONS

At the outset of Restore Hope, some shipping had been readied for prompt use. Three Fast Sealift Ships had been mobilized and two sent to the ports expected to be used: the *Pollux* to Bayonne and the *Capella* to Wilmington, North Carolina. (Ships for deploying Navy SeaBee equipment were also positioned at seaports in California and Spain.)

Sealift to Somalia was accomplished with available DoD shipping, including ships already under charter and six of the eight FSSs. Given the decision to use the FSSs, Ready Reserve Fleet (RRF) ships were not needed. In the first six weeks, total sealift deliveries amounted to 1.1 million square feet of unit cargo with about 950,000 square feet (86 percent) Army cargo and the rest SeaBee equipment. Later deliveries added about 180,000 square feet of Army cargo and 88,500 of Navy/Marine Corps equipment.

SEALIFT OF UNIT EQUIPMENT

Army unit equipment was sent to Somalia aboard eight ships (see Table 2). Six of these ships made deliveries during the first six weeks; the remaining two were en route as of January 20. Six of the eight were the Fast Sealift Ships that are kept in reduced operating status, ready for employment on four days notice. The other two ships are U.S. flag commercial ships that were already under charter to DoD for other purposes.

Table 2

Army Unit Equipment Deployed on Eight Ships

Ship	Arrival at Mogadishu	Cargo Volume (ft^2)	Cargo Type
Pollux	January 01	151,310	10th MTN DIV
American Falcon	January 02	94,710	12th AVN BDE
Altair	January 04	150,565	10th MTN DIV
Bellatrix	January 08	170,018	CS/CSS
Algol	January 12	168,989	CS/CSS
Capella	January 20	159,786	7th Trans Group
Total delivered to 1/20/93		895,378	
Denebola		146,000 (est.)	CS/CSS
American Eagle		37,630	CS/CSS
En route on 1/20/93		183,630	
Total Army Unit Equipment		1,079,008	

This employment was in accordance with MSC's priorities, which called for the use of commercial ships already under charter first and the most ready government-owned ships second. The risk to sealift capabilities for a major combat contingency was, according to the Navy and USTRANSCOM, recognized and accepted.

Figure 6 compares the actual deliveries of Army unit equipment with an estimate of the capacity that might have been available. The estimate begins with ship status as of D-day and calculates what might have been delivered if planning factors (based on Desert Shield deployment experience) had been realized.[1] Initial performance was quite close to the estimate of capacity, but during January actual shipping deliveries fell two to three weeks behind the calculated expectation.

Four factors contributed to the slippage. First, ships were in port far longer than planning factors for ship loading allowed for. This delay

[1]This estimate differs little from MSC's expectations in mid-December. At that time, MSC estimated that the last ship carrying Army equipment would arrive at Mogadishu on January 10.

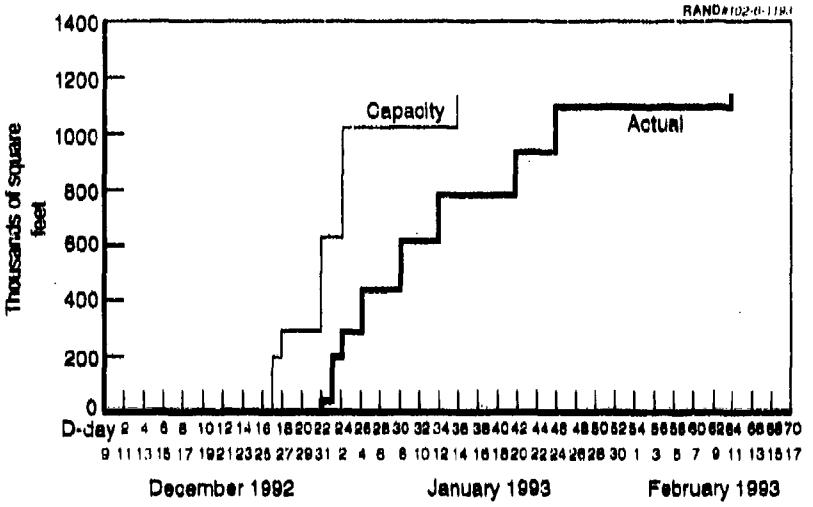

Figure 6—Army Deliveries by Sealift Lagged Estimated Capacity

might have been because of the effects of bad weather on loading times, mechanical problems, or the lack of Army cargo available for loading. Determination of the actual cause requires additional data and analysis. Second, some ships had to multi-port: the *Denebola*, the last ship to deliver Army unit cargo, took on cargo at three different CONUS ports. Planning estimates usually assume that there is sufficient cargo at a port to fill each ship, so less time is spent in ports in the capacity estimate. Third, one ship—the *Capella*—suffered an engineering problem, had to put into Rota, Spain, for inspection, and then was limited to 12 knots (compared to a planning factor of 23.5) for the rest of its voyage to Somalia. The fourth and most prominent reason is the reduced port capacity at Mogadishu. Only one FSS could be berthed at a time, so some were slowed en route so they could be metered into the port.

SUSTAINMENT SEALIFT

Sealifted sustainment cargo reached Somalia via two channels. At three U.S. ports, sustainment materiel was loaded onto the *Gopher*

State, an RRF auxiliary crane ship for handling containers, and delivered directly to Somalia.[2]

The second channel involved a mix of commercial and DoD shipping using containers. The containers were leased by DoD, stuffed at Defense Logistics Agency (DLA) depots, moved to commercial ports, and shipped to Alexandria, Egypt, in commercial container ships.[3] MTMC established a transshipment point there (with a staff of four to oversee operations) and the containers were loaded onto Military Sealift Command "shuttle" ships for forwarding to Somalia. As of the end of March, this channel had handled nearly 1150 20-ft. containers. Most of this cargo was thought to be MREs and other foodstuffs, with an estimated 10 tons per container. About 94 percent of the sustainment cargo originated in CONUS; the balance came from Europe.

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[2]Initially, MSC had chartered the *Corpus Christi* and positioned her at Bayonne for loading sustainment cargo. However, mechanical problems with the ship's cranes prevented loading, she was taken "off hire" on December 27, and the *Gopher State* was given the task.

[3]Two commercial lines supported Restore Hope container operations from CONUS: Farrell Lines Incorporated and Lykes Brothers Steamship Company.

Chapter Eight

DEPLOYMENT OPERATIONS IN SOMALIA

Reception and offloading of Army personnel and equipment in Somalia were conditioned by the seaport and airport facilities there. Port facilities had been devastated like the rest of the infrastructure. Just as airfield conditions initially constrained airlift operations, the ability of the seaport to handle shipping limited deliveries by sea. There was one small crane operative in the seaport, and the harbor itself was cluttered with wrecks. The Marine Corps operated the port until responsibility for port operations was transitioned to the Army's 7th Transportation Group on January 15 (D+37).[1] Port activity during this period is summarized in Table 3.

Ships carrying Army and SeaBee cargo delivered only 22 percent of the cargo offloaded in Mogadishu during the first 37 days of Restore Hope. During this period, the port handled 51 ships and nearly 118,000 short tons of cargo.[2] Coalition nations, employing a large number of smaller ships, delivered at least as much military equip-

[1]In the initial stages of the operation, the Marine Corps 1st Force Service Support Group provided common item support and common user support to other U.S. and coalition forces in Somalia. Relying heavily on supplies and equipment from the MPSs, the Marines established a Logistics Movement Control Center, produced and distributed water, handled bulk fuel, and provided communications, Explosive Ordnance Disposal (EOD), laundry, motor transport, medical, and supply support services until the Joint Task Force Support Command was operational.

[2]This comparison uses short tons of cargo, rather than square feet (a better measure for Army unit equipment), because tonnage is the only measure of the volume of humanitarian shipments. Thus, tonnage must be used to make overall comparisons. Army tonnage figures are taken from records provided by the 7th Transportation Group and other official sources.

Table 3

Ship Unloading Operations at Mogadishu to D+37

Source of Cargo	Ships	% of Cargo
U.S. military		
Army and others	7	22.0
Marine Corps	5	20.5
Subtotal	12	42.5
Coalition military	25	20.9
Humanitarian and other	14	36.6
Total	51	100.0%

ment and supplies as MSC did for the Army. And, appropriately, humanitarian cargoes for a wide variety of relief organizations were more than a third of the cargo delivered. Army deliveries were not significantly slowed by the need to compete with these different cargoes in such a small seaport. On the average, FSSs carrying Army cargo entered the port 15 hours after reaching Mogadishu, although, the facilities at Mogadishu could accommodate only one FSS at a time.

As the CINC's appreciation of the situation grew, requirements for specific types of equipment in the theater were reduced. Priority was given to water-production equipment, engineering assets, trucks, and skilled support personnel. At least 480 pieces of Army equipment were "backloaded" (returned to the United States without being used) on the first four ships arriving at Mogadishu (13 percent of the cargo they carried). Backloading operations followed immediately after the completion of discharge.

The mix of port operations changed after the 7th Transportation Group took responsibility. Humanitarian cargo continued to flow through the port, as did coalition military deployments. Two more FSSs carrying Army equipment arrived and were discharged. Marine Corps operations, however, shifted to backloading the four MPSs that had been unloaded earlier. At the same time, sustainment cargoes began to arrive by sea.

Onward movement operations were relatively limited. Most Army units remained in the Mogadishu area and conducted their operations from there. The second largest concentration of Army units was at Baledogle, where many Army personnel were directly deployed. A few Army units deployed to Kismaayu, about 225 miles south of Mogadishu. The road between Mogadishu and Kismaayu was impassable, so operations there were made and supported largely by watercraft.

The 7th Transportation Group trucking services supported Army units, helped other services, and assisted with humanitarian operations. On a typical day in the first week of February 1993, the 24th Transportation Company, the 100th Transportation Company, and the 870th Transportation Company were conducting a dozen motor transport missions. Cargo included unit equipment, food supplies, and construction materials delivered to forward locations such as Jilib, Bardera, Baidoa, and Baledogle. Other cargo was hauled within the Mogadishu area. A mission could require as many as 15 trucks and last as long as three days. Apparently, the availability of military trucks within Somalia was not a problem after late January.

The distribution of air-delivered cargo—including spare parts for Army helicopters—encountered some problems. The A/DACG seldom knew when planes were arriving, much less what cargo they carried. Supply personnel got no cues from automated systems, although the satellite communications provided for the Logistics Assistance Representatives (LARs) helped to coordinate supply actions. When offloaded, pallets were sent to a storage area near the Mogadishu airport. Personnel from the Materiel Management Center would visit this area in search of designated cargoes, and when they were located arranged to have them delivered to the requisitioners. The Supply and Service Company needed for this function had been deleted from the TPFDD to meet the Army personnel cap.

Chapter Nine

OBSERVATIONS

In Operation Restore Hope, everything to be used and consumed had to be taken to Somalia by the participants. The operation provides a good basis for speculating about future large-scale humanitarian operations that may put the Army into similar austere or devastated environments. There is no doubt that Operation Restore Hope succeeded in meeting the initial objectives set by the President. U.S. and coalition forces provided security for relief organizations, starvation was dramatically reduced, and responsibility for continuing security was transferred to UN forces in less than five months.

Several observations emerge from this review of Restore Hope Army deployment operations. First, the TPFDD process was managed in such a way that it was not a reliable management tool for executing deployment operations. Second, the movement to ports was rapid and smooth. Third, deliveries to the theater were limited by weather and poor facilities. Fourth, all available FSSs were employed. Finally, coalition operations provided significant support as well as competition for facilities.

Army leaders should examine five main issues that emerge from this review of the first three months of Army Restore Hope deployments:

1. How can Joint deployment management systems better cope with varying and unpredictable demands?
2. How many and what kind of Army logistics and other support units should be kept ready for immediate deployment?

3. What joint deployment capabilities should be applied to humanitarian operations like Restore Hope?
4. How can Army use of prepositioning ships be improved?
5. How much management attention should be given to tracking high-level mission accomplishments? How can progress in humanitarian operations be measured?

Some key considerations in analyzing these issues are outlined in the following paragraphs. All of the issues raised and options suggested require further analysis by the Army, and many require action outside the Army. Because the Army necessarily relies on joint support when deploying, it must be prepared to develop and advocate systems, procedures, and policies for the joint deployment community that will enhance the Army's abilities to contribute to future humanitarian operations.

ADAPTING JOINT DEPLOYMENT SYSTEMS

The Army portion of the Restore Hope TPFDD varied substantially. Many of the reasons were undoubtedly beyond the Army's control; some major influences, like weather, were beyond anyone's control. Others reflected changing operational conditions. Whatever the cause, the variation apparently caused problems for USTRANSCOM. USTRANSCOM is responsible for planning and conducting transportation operations for the supported CINC. They properly aim to conduct transportation operations as efficiently as possible. Dealing with the problem requires two distinct types of changes.

Some participants reported being hampered by a lack of trained, experienced, and responsive personnel. The first obvious change is to fix this. The Army should survey its needs for JOPES-trained personnel in major deployments and plan to provide the requisite number of experienced personnel to all commands that will provide inputs and receive products from the JOPES system. Commands need to be able to identify JOPES-trained personnel and to maintain staffing levels consistent with their needs in major contingencies. Units should maintain up-to-date TPFDDs for each deployment planned. The use of full-time civilian personnel with the requisite expertise has also been suggested as a way to overcome the problem.

The second, less obvious, step in dealing with this problem is to realize that deployment plans will always vary enough to upset transportation plans. While it is easy to suggest that predictions must be improved and planning must be extended, such efforts are unlikely to yield significant benefits. Large-scale real-world events cannot be scripted in detail in advance. Under the best of circumstances, the TPFDD will vary. More and better trained personnel will mitigate the effects of unexpected variations; they cannot eliminate them.

If we accept this perspective, we can then ask whether transportation operations can be adapted to absorb variation. Airlines use "hub and spoke" operations to reduce variation in their loads on longer-range flights. In the same manner, AMC could operate from four or five regional deployment centers, with the users responsible for getting their passengers and cargo to the centers. A staging capacity would permit the centers to carry a small backlog of cargo, and priorities or other guidance from the supported CINC would allow TRANSCOM to sequence movements to and from the centers. Reliable communications among the CINC, TRANSCOM, and the deploying forces would be vital. Some of the troublesome details of the TPFDD could be discarded and transportation planning could proceed on the basis of more aggregate planning. Personnel would be trained and procedures in the services and in TRANSCOM would be adapted to mitigate the effects of variation. Deployment system operators would take part in repeated and strenuous training exercises that stress adaptation in the face of unexpected developments.

Under this proposal, precision in planning is sacrificed for the benefit of better use of available transportation in contingency operations.

DETERMINING LOGISTICS READINESS FOR DEPLOYMENTS

In operations similar to Restore Hope, logistics support capabilities like trucking, medical, engineering, and civil affairs become the heart of the Army's mission. Combat forces are needed to ensure the security of logistics in humanitarian operations just as support capabilities are necessary to sustain and support Army combat forces in war-fighting contingencies. While every deployment requires a ju-

dicious balance of combat and support forces, in humanitarian operations that balance tilts toward the support forces. This is called tailoring or task organizing for the mission.

To meet these kinds of demands, the Army may wish to consider establishing "ready groups" of certain kinds of support activities within the pool of contingency response forces. The needed support capabilities exist now in both active Army and reserve units. The suggestion here is that some of the active units be routinely kept ready for short notice deployments. This could be accommodated within the Contingency Force Pool the Army is developing. The selection and sizing of the support units and skills to be kept at the ready should result from careful study of potential humanitarian and peace-keeping contingencies. Mission needs will vary in different contingencies, so a range of functional capabilities must be ready.

Achieving a highly ready posture for selected CS/CSS functions would add to support costs, but would yield a more robust and responsive support posture. And the ready units would, of course, be postured to support combat deployments as well.

ASSIGNING JOINT DEPLOYMENT CAPABILITIES

DoD planning considers the potential of simultaneous major regional contingencies. But even humanitarian operations like Restore Hope draw on limited deployment capabilities. Restore Hope was not generally treated as an emergency deployment; nevertheless, six of the nation's best sealift ships (FSSs) were used. They were thus diverted from their main mission of carrying heavy Army forces to future contingencies. Although this action posed some risks, they were judged to be acceptable by USTRANSCOM and the Navy.

In the event of a major contingency requiring the shipment of heavy Army forces, complete delivery (closure) of the two heavy divisions of the Contingency Corps would have been delayed about three weeks, from 30 to 50 or more days after C-day. Thus, the Army should have a different perspective. The obvious alternative is to use the older roll-on/roll-off ships of the Ready Reserve Fleet for humanitarian operations like Restore Hope and hold the FSSs in readiness for

potential major contingencies.[1] Using smaller, slower RRF ships for large-scale humanitarian operations would probably cause a small delay (perhaps a few days) in initial Army force deliveries. But if FSSs can be mobilized prior to D-day, so could RRF ships, reducing the delays to differences in steaming times. In fact, recent DoD planning places the RRF roll-on/roll-off ships in the same readiness status as the FSS.

The impact of using RRF ships first would be felt later in major contingency deployments; elements of the later deploying Army support forces would be delayed while heavy combat units would be deployed according to Army plans. Mobility modeling should evaluate the deployment effects of alternative shipping policies on force closures in major humanitarian contingencies. Evaluating the net effect of slower deployments raises broader issues about concurrent humanitarian and combat operations.

Using RRF ships for humanitarian missions maintains the nation's preparedness for major contingencies. But costs for humanitarian operations would be increased because more ships would be needed.

ADAPTING PREPOSITIONING SHIPPING

The Army's sea-based prepositioning is organized for major contingencies, not for humanitarian operations. Given the problems of the LASH vessels in Restore Hope, some alternatives should be considered to enhance capabilities for humanitarian activities. Employing smaller ships is an obvious but costly solution to the problem of access to small ports. Loading the ships to provide access to the specific items needed for humanitarian operations is another obvious improvement.[2] Studying problems of off-loading "in the stream" in higher sea states, improving Army capabilities for in-stream offloading operations by lighterage or helicopters, and practicing such operations under realistic conditions is also desirable. Such potential

[1] It should go without saying that shipping and other lift employed in contingency deployments should be able to use the ports and airfields in the operating area.

[2] These considerations apply equally to the design and loading of the new prepositioning ships planned for deploying Army armored forces and support units.

changes add to the costs of the Army prepositioning posture but yield a more robust early capability.

MONITORING HIGHER-LEVEL MISSION ACCOMPLISHMENTS

Judging from the situation reports, messages, and briefings reviewed when studying Army deployments to Somalia, little management attention was given to capitalizing on the accomplishment of humanitarian goals. Strictly speaking, delivering food and improving conditions in Somalia were not assigned military missions, although these activities were publicly perceived as the purpose of the U.S. military deployments. According to the records examined, however, military leaders focused their attention on more narrow, strictly military concerns. No goals for humanitarian performance were set nor was progress toward the overall humanitarian goals monitored.

The media reported many instances of the soldier on the ground assisting Somali individuals and groups. Available records show that the Army provided transportation and medical care, cleaned up and constructed facilities, restored basic services, helped establish the rudiments of civil authority, and, above all, facilitated the safe movement of food supplies to famine centers in the interior of Somalia. These were the fundamental Army accomplishments in Restore Hope,[3] and we can wish they had been better documented and reported during the operation. Such capabilities are one of the many reasons the public funds military forces. The Army missed an excellent opportunity to report to the public and their representatives that it contributed importantly to making this happen. The message

[3]Top DoD leaders recognize the importance of reporting progress toward humanitarian goals. General Sullivan, the Army Chief of Staff, in an interview published in *Army* (April 1993), noted the "remarkable" reduction in the number of deaths in Somalia. Vice Admiral Kalleres, the Commander of the Military Sealift Command, cited the increase in the level of food deliveries in an interview published in *Sea Power* (May 1993). Military personnel in Somalia provided many types of humanitarian assistance. Perhaps joint records provide a better accounting of these activities than is contained in the Army records reviewed during this study.

is too important to leave to the historians of Operation Restore Hope.[4]

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[4]For example, security for relief operations resulted from a wide variety of military activities. The Army gathered intelligence on Somali warlords and bandits and used it to advise relief organizations. Civil affairs units negotiated with local leaders to gain information and arrange for unobstructed food shipments. More traditional military activities involved shows of force to deter banditry and "riding shotgun" (escorting) humanitarian shipments. Army units also cleared mines and loose munitions from the countryside, enabling freer passage of both food and refugees. They made routine patrols, conducted area sweeps, and provided rapid reaction forces when incidents occurred. Finally, the military collected weapons and "technicals" (lightly armed vehicles) whenever the situation called for it. Engineering, medical, and transportation conducted an equally wide range of humanitarian activities. If the Army is to be prepared for future humanitarian operations, it needs to catalog and analyze these activities and measure how well they contributed to ultimate mission success.

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