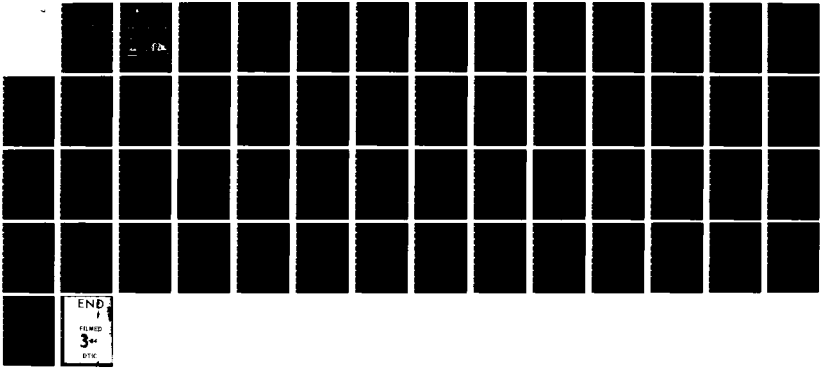
AD-A137 964 MOBILIZATION AND DEFENSE MANAGEMENT TECHNICAL REPORTS SERIES CONTAINERIZA.. (U) INDUSTRIAL COLL OF THE ARMED FORCES WASHINGTON DC D K ANGEL ET AL. APR 83 1/1

UNCLASSIFIED NDU/ICAF-83/052 F/G 5/2 NL

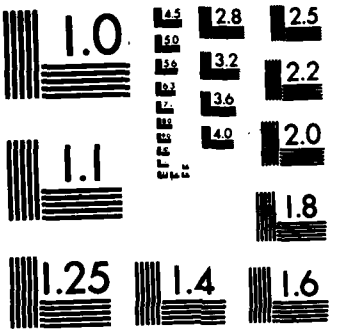


END

FILMED

3-84

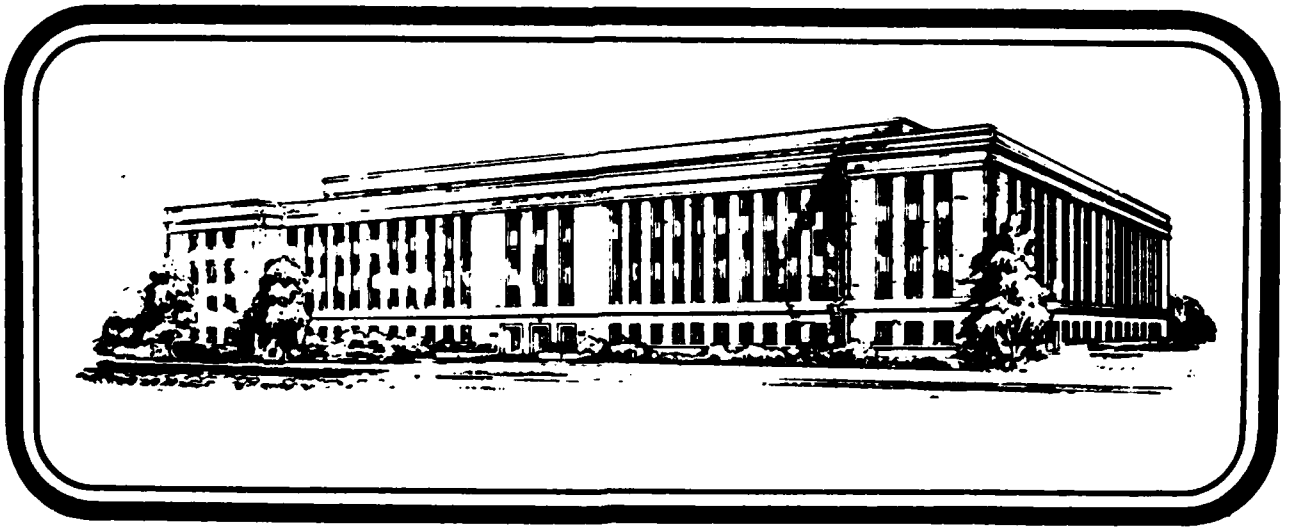
DTIC



NATIONAL DEFENSE UNIVERSITY

MOBILIZATION AND DEFENSE MANAGEMENT TECHNICAL REPORTS SERIES

CONTAINERIZATION - A SNAPSHOT OF THE 1980's



INDUSTRIAL COLLEGE OF THE ARMED FORCES

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER: NDU/ICAF - 83/052 2. GOVT ACCESSION NO.: AD-A137964	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle): CONTAINERIZATION - A SNAPSHOT OF THE 1980'S	5. TYPE OF REPORT & PERIOD COVERED: MSP #48 AY 82/83
	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s): DONALD K. ANGEL, LTC, USMC EDWARD B. ENGLISH, LTC(P), USA ROBERT R. RENIER, LTC, USMC;ROY T. YAMACHIKA, LTC(P), USA	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS: INDUSTRIAL COLLEGE OF THE ARMED FORCES FORT LESLEY J. MC NAIR WASHINGTON, DC 20319	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS: INDUSTRIAL COLLEGE OF THE ARMED FORCES FORT LESLEY J. MC NAIR WASHINGTON, DC 20319	12. REPORT DATE: APRIL 1983 13. NUMBER OF PAGES: 48
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office): NATIONAL DEFENSE UNIVERSITY FORT LESLEY J. MC NAIR WASHINGTON, DC 20319	15. SECURITY CLASS. (of this report): UNCLASSIFIED 15a. DECLASSIFICATION DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report): UNLIMITED APPROVAL FOR PUBLIC RELEASE	
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report): N/A	
18. SUPPLEMENTARY NOTES: N/A	
19. KEY WORDS (Continue on reverse side if necessary and identify by block number): N/A	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This paper traces the chronology of the Department of Defense's recognition of and degree of adaptation to the trend toward intermodalism (containerization) in the commercial maritime industry, as it bears on the sustainment of deployed combat forces. It cites and assesses DOD and service policy guidance and oversight mechanisms, doctrinal and hardware development, and operational planning. The paper documents the researchers' original contention that the DOD has insufficiently accommodated to the "container revolution." Go To IV

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

THE INDUSTRIAL COLLEGE OF THE ARMED FORCES

NATIONAL DEFENSE UNIVERSITY

MOBILIZATIONS STUDIES PROGRAM REPORT

CONTAINERIZATION-A SNAPSHOT OF THE 1980's

by

Donald K. Angel, LTC, USMC
Edward B. English, LTC (P), USA
Robert R. Renier, LTC, USMC
Roy T. Yamachika, LTC (P), USA

A RESEARCH REPORT SUBMITTED TO THE FACULTY

IN

FULFILLMENT OF THE RESEARCH REQUIREMENT

RESEARCH SUPERVISOR: COL JAMES LANCASTER (MCDC), USAF

THE INDUSTRIAL COLLEGE OF THE ARMED FORCES

APRIL 1983

A-1

ABSTRACT OF STUDENT RESEARCH REPORT
INDUSTRIAL COLLEGE OF THE ARMED FORCES

NAME OF RESEARCHER (S)
Angel, Donald K., LTC, USMC
English, Edward B., LTC(P), USA
Renier, Robert R., LTC, USMC
Yamachika, Roy T., LTC(P), USA

TITLE OF REPORT
Containerization - A Snapsnot of the 1980's

SECURITY CLASSIFICATION OF REPORT
Unclassified

REPORT NUMBER
M MSP #48

ABSTRACT

Problem Statement: This paper traces the chronology of the Department of Defense's recognition of and degree of adaptation to the trend toward intermodalism (containerization) in the commercial maritime industry, as it bears on the sustainment of deployed combat forces. It cites and assesses DOD and service policy guidance and oversight mechanisms, doctrinal and hardware development, and operational planning. The paper documents the researchers' original contention that the DOD has insufficiently accommodated to the "container revolution."

Findings/Conclusions:

1. The paucity of U.S. Navy amphibious shipping and Military Sealift Command cargo-carrying capacity has created an enormous dependence on commercial bottoms for the sustainment of deployed combat forces in protracted conflict.
2. In the last two decades, the commercial cargo fleet, in the interest of profitability, has been transformed by large, swift, economically-efficient container ships, as smaller but militarily more flexible breakbulk ships have been retired.
3. The Department of Defense formulated policy and organizational mechanisms for adaptation to the trend toward containerism a decade ago, since which time departmental and service efforts have become increasingly decentralized, fragmented, and, hence, less effective. Efforts seem to have languished for lack of a coordinated stimulus and enforcement mecnanism.

Recommendations:

1. The Department of Defense should, through the Intermodal Steering Group, or a similar structure, reassert more positive control of the containerization effort.
2. Service funding requirements should be explicity identified and subsequently allocated, using a DOD "fenced" program if required.
3. Innovative approaches for the exploitation of containers and container dimensions should be pursued vigorously, with as much interaction with the commercial shipping industry as possible.
4. All future command post exercises should include mobility and sustainment criteria in order to highlight and solve those problems associated with deployment and maintenance of a deployed fighting force.

THIS ABSTRACT IS UNCLASSIFIED

ICAF FORM 56 (REVISED)

DISCLAIMER-ABSTAINER

This research report represents opinions, conclusions, and recommendations expressed or implied within and are solely those of the authors and does not necessarily reflect the views of the National Defense University, the Department of Defense, or any other Government agency or private organization.

TABLE OF CONTENTS

CHAPTER		PAGE
	DISCLAIMER-ABSTAINER	ii
	EXECUTIVE SUMMARY	iv
I.	INTRODUCTION	1
II.	DEPARTMENT OF DEFENSE CONTAINERIZATION POLICY	3
III.	SERVICE CONTAINERIZATION POLICY	10
IV.	CURRENT DEVELOPMENTS-SERVICE CONTAINER SYSTEMS	15
V.	SELECTED ISSUES	27
VI.	INNOVATIONS AND IDEAS FOR ADDITIONAL CONSIDERATION	40
VII.	CONCLUSION	42
	FOOTNOTES	44
	BIBLIOGRAPHY	46

EXECUTIVE SUMMARY

This study offers a current snapshot of containerization within the Department of Defense as it bears on surface strategic mobility.

Areas addressed include policy, current development, selected issues of concern and innovations. Specifically addressed are sealift and over-the-shore problems. Airlift and land container-related systems are not included.

Initial assumptions concerning DOD capabilities to utilize intermodal transport proved accurate. Though much has been done and far more has been studied and discussed, the services are presently incapable of utilizing containerization to its full potential.

The study surfaces a number of conclusions which can be summarized as follows:

1. The drastic reduction in U.S. Navy and Military Sealift Command cargo carrying capability has created an enormous dependence on civilian shipping.

2. The shipping industry today is overwhelmingly committed to containerization.

3. The preponderance of cargo required to support our forces in any conflict will have to go by sea.

4. Current emphasis within DOD and the individual services upon containerization is inadequate.

In light of the above conclusions, this study offers the following recommendations:

1. That DOD develop, through the Joint Intermodal Steering Group or some similar structure, positive control of intermodal transport to enhance coordination, reduce cost and, if necessary, force interservice cooperation.

2. That innovative approaches for the DOD's use and procurement of containers be developed. Approaches should be developed in concert with the civilian sector to the extent possible.

3. That all future mobilization exercises include mobility and sustainment criteria in order to highlight and solve those problems associated with deployment and maintenance of a fighting force.

4. That sufficient funding be allocated toward bringing the full advantages of containerization to the military environment.

Chapter I

INTRODUCTION

The protection of the United States and allied security interests dictates ~~the necessity to have~~ possession of sufficient maritime capability to rapidly deploy and sustain combat forces throughout the world.

The Soviets' incursion into Afghanistan in 1979 precipitated creation of the U.S.'s Rapid Deployment Joint Task Force (now Central Command), with concomitant strategic mobility dilemmas inherent in a range of Southwest Asia-Indian Ocean scenarios. Introduction of the Near-term Prepositioning Force (NTPF), sea-going warehouses in the vicinity of Diego Garcia, offers short-term supply support for joint operations in this theater. It does not, nor was it intended to, provide for sustainment of our committed forces in a protracted conflict. The issue of identification and exploitation of surface strategic mobility assets for combat resupply in this theater is one of immediate concern within the Department of Defense. The resupply issue, in a broader context, has assumed greater urgency with the significant reorientation of our national security strategy by the present administration.

The current administration's espousal of a global, forward-deployed strategy, with its inherent potential for protracted conventional war, has given the issue of combat resupply by surface strategic means a global perspective. In the global context, then, the protection of our own and ~~the~~ allied security interests and clearly our ability to prevail in combat, dictates the necessity to have sufficient sea-going capability to rapidly deploy and sustain combat forces throughout the world.

The issue of combat resupply by surface means cannot be addressed without first recognizing the quantitative inadequacy of Navy and Military Sealift Command ~~and commercial~~ ships to perform this task on a large scale. Second, one must recognize that, in the last two decades, commercial containerization and inter-modal transportation systems have revolutionized the movement of material. The U.S. commercial fleet, by necessity the source of strategic mobility for combat resupply, has been transformed by the dominance of container vessels and the relative demise of less economically efficient, but more militarily versatile breakbulk ships.

Presently, it appears that the Department of Defense has not fully adjusted to the container revolution which poses potentially severe problems for the deployment and sustainment of combat forces.

This paper traces the chronology of events in the Department of Defense's attempt to adjust to the container revolution. It attemps to assess the adequacy of DOD policy guidance and oversight in the exploitation of containerization. Further, it describes the individual service's efforts to integrate containerization into doctrinal development, operational planning and system acquisition. Selected containerization issues identified as being unresolved, are addressed in the context of the students' research and military judgment, and recommendations are proposed. Innovative container applications and ideas are also offered.

Chapter II

DOD CONTAINERIZATION POLICY

This chapter acknowledges the Department of Defense's recognition of its dependence on the U.S. commercial fleet as the major contributor to surface strategic mobility. It documents the department's efforts to adjust to the significant, economically-driven transformation of the civilian fleet from breakbulk to container ships. Further, it traces the chronology of departmental containerization policy and guideance issuance, while describing the apparatus for the oversight of policy implementation.

The current administration's national security strategy restores to pre-eminence the likelihood of a protracted, global, conventional conflict. The consequent impact on surface strategic mobility for the sustainment of our theater combat forces, the thrust of this paper, is profound.

Today, over 90% of the world's dry cargo is borne by maritime fleets characterized generally by a growing number of large, swift, economically efficient container ships, and a dwindling number of smaller, less profitable but militarily more flexible breakbulk vessels. "Currently, over half of the dry cargo capability of the U.S. merchant fleet resides in containerships. Arguments regarding the comparative merits of breakbulk ships aside, the nation cannot afford to ignore the military potential of that much sea-lift."[1] Eighty (80) percent of our peacetime defense cargo, excluding aircraft and ammunition, moves overseas in containers. To say that an equal or greater amount of wartime sustainment requirements will be transported by sea container is above argument.

The Department of Defense would, if given the option, effect maritime resupply with a large number of small breakbulk ships of proven military utility, augmented by a lesser number of swift roll-on/roll-off (RO/RO) ships for outsized cargo.[2] Despite DOD efforts to acquire retiring breakbulk ships for the National Defense Reserve Fleet (NDRF) and the acquisition of TAKR fast logistic RO/RO ships, aggregate numbers of available ships of these types are totally inadequate for a major wartime resupply effort.[3] The DOD recognized this inadequacy a decade ago, and accepted the inevitability of relying heavily on commercial intermodal (container) carriers for sustainment during hostilities.

The metamorphasis of the surface transportation industry, beginning in the early 1970's into an intermodal system of truck, rail and sealift-compatible containers confronted the DOD with policy, organizational, doctrinal and technical dilemmas. The department recognized that it had no recourse but to assume the lead in establishing policies that would require the services and defense agencies to consider containerization in doctrinal development, operational planning and system acquisition.

A Joint Logistics Review Board was chartered to assess, among other things, the evolving revolution in surface transportation. A concise chronology of the evolution of containerization management is found in the introduction of the DOD "Project Master Plan For A Container-Oriented Distribution System" (draft):

"The Deputy Secretary of Defense initiated action in 1971 that designated the Army as the Executive Agent for Department of Defense for Surface Container Supported Distribution Systems development. System development was vested in a DOD Project Manager (PM CS) with a Joint Container

Steering Group (JCSG) appointed by and under the broad policy guidance of the Logistics Systems Policy Committee (LSPC) to coordinate the PM's efforts. In late 1971, the Assistant Secretary of Defense, (Installations and Logistics) (ASD(I&L) requested JCSG to terminate the DOD PM CS charter by the end of FY 74. The charter was terminated on June 30, 1975, with project development responsibilities delegated to the Military Services, and with the JCSG assuming a stronger container system management role.

To assist the JCSG in its role, temporary arrangements were made to establish a full-time Container Systems Standarization/Coordination Group (CSS/CG) under the working direction of the OASD(I&L) member as the Chair, JSCG. With the termination of LSPC on June 30, 1976, the ASD(I&L) assumed responsibility for coordinating and providing guidance for DOD container system development through the JCSG. In July 1976, the ASD(I&L) approved the permanent establishment of the CSS/CG within OASD(I&L).

On July 3, 1979 the principal members of the JCSG agreed to change the name of the JCSG and the CSS/CG tO Joint Intermodal Steering Group (JISG) and Intermodal Coordinated Group (ICG), respectively. This change would appropriately reflect an expanded role of each activity concerning the total realm of intermodality.

As container systems development progressed to a mature stage within the Services, the principal members of the JISG agreed on May 13, 1980, to additional changes in program development relationships, as follows: (a) continue to meet but on a less frequent basis; (b) address intermodal issues common to all Services and respond to service container-related tasks through the Secretaries of the Military Departments; (c) monitor progress of functions assigned to the Services under the DOD Project Master Plan; (d) establish a DOD Intermodal Systems Program Coordinator; and (e) disband the ICG."[4]

On July 30, 1981, diffuse defense guidance on the many facets of containerization and transportability engineering ~~were~~ was consolidated in DOD Directive 4540.6, Intermodal Systems Development. This directive issued explicit policy for "management and effective development of an intermodal system within the Department of Defense and between the military departments and defense agencies."[5] Further, it established the membership, functions and responsibilities of the Joint Intermodal Steering Group (JISG).

Briefly stated, the current DOD policy on containerization charges DOD components with developmental implementation of a container-oriented distribution system consistent with the requirements of combat resupply, while

ensuring the "commonality and interchangeability of intermodal containers, hardware and equipment between the military services and commercial industry."[6]

The Joint Intermodal Steering Group, charged with oversight of the department-wide containerization effort, is chaired by the Director of Transportation and Distribution Policy, Office of the Assistant Secretary of Defense (MRA&L). Principal members of the JISG are as follows:

Army -- Director of Transportation, Energy, and Troop Support
DCS, Logistics, Headquarters, U.S. Army

Navy -- Director, Logistics Plans Division (OP-04)
Deputy Chief of Naval Operations, Logistics

Air Force -- Director of Transportation
DCS, Logistics and Engineering, Headquarters,
U.S. Air Force

Marine Corps -- Director, Facilities and Services Division
Headquarters, U.S. Marine Corps

Office of the Joint Chiefs of Staff -- Deputy Director, Strategic Mobility, J-4

Defense Logistics Agency -- Executive Director, Supply Operations
Headquarters, DLA

Advisory members who fulfill specialized roles in addressing unique aspects of intermodal transportation are:

Maritime Administration--Director, Port and Intermodal Development

U.S. Coast Guard -- Chief, Office of Merchant Marine Safety

Military Traffic Management Command -- Commander, MTMC

Military Sealift Command -- Commander, MSC

The Joint Intermodal Steering Group's charter outlines these tasks and duties:

-- "Facilitate, expedite, and complement, but not supplant, the chain of command to ensure development of intermodal systems within the Military Services, DOD Components, and MARAD.

-- Meet with the chair periodically to:

(1) Discuss intermodal issues of common interest to the JISG members.

(2) Discuss and coordinate intermodal systems developments and initiatives occurring in the commercial sector.

(3) Provide advice on intermodal issues when appropriate.

(4) Review at least annually the status of each program assigned in DOD 4540.6-P, the DOD Project Master Plan for a container-oriented distribution system.

-- Evaluate container systems development progress.

-- Ensure that intermodal container systems development meets the Military Services' needs, and achieves the overall objectives of the Department of Defense."[7]

The JISG currently meets annually, with its next meeting to be held in April, 1983. The agenda for this meeting provides a sampling of the kinds of surface transportation issues normally addressed. Among other things discussed, will be the current status and outyear milestones for the Navy's Container Offload and Transfer System (COTS), and the Army's Container Ammunition and Distribution System (CADS).

Perhaps the most significant organizational dilemma posed by the intermodal, "origin-to-destination" container system is the loss of heretofore clearcut jurisdictional boundaries between our "in-house" surface transportation managers, the Military Traffic Management Command (MTMC) and the Military Sealift Command (MSC). The DOD's current position, based on extensive analysis, recognizes that it is inherently inefficient to have two large, computer-based bureaucracies managing sealed, containerized cargo, one for the land transportation leg (MTMC) and another for the sea transportation leg (MSC). Former Deputy Secretary of Defense Carlucci stated recently, "our experience in Joint Chiefs of Staff mobilization exercises like Nifty Nugget and Proud Spirit; studies by the Congress, General Accounting Office, and independent contractors, and day to day operating experience have shown clearly that the cumbersome coordination mechanisms necessitated by our current organization for surface transportation management are a major impediment to the rapid implementation of our contingency plans."[8] The current effort to integrate MTMC and MSC into a single Military Transportation Command, deriving both "improved operational readiness and peacetime economies and efficiencies,"[9] is at a Congressional impasse. This issue will not be readdressed elsewhere in this paper. It should be recognized, however, that our ability to take maximum advantage of the efficiencies of containerization is severely degraded under the existing surface transportation organizational structure.

Chapter II has traced evolution of the DOD's efforts in accommodating to the container revolution. The apparent move toward decentralization of control over adaptation to containerization, predicated on the maturity of

service programs and the assumed ability of the services to proceed autonmously, is an issue that will be dicussed later in the paper.

The MIMC-MSC integration issue, although noteworthy, is seen as tangential to the thrust of this analysis and will not be addressed further.

Chapter III

SERVICE CONTAINERIZATION POLICY

Chapter III addresses the services' efforts to implement Department of Defense containerization policy. It cites the caution expressed by the services as they proceed with their commitment to inter-modalism. Their concern that economic pressures on the commercial carriers will lead to hardware incompatability is described, as are encouraging signs of greater interservice cooperation in systems development. It should be noted that research has revealed no disparity in containerization policy between the DOD and the OJCS.

The individual services have embraced containerization to varying degrees and at different paces over the last decade. Both the Army and Marine Corps have recognized the advantages of intermodalism and the requirement to make progress toward accommodating to this revolution in surface transportation. In a current Army doctrinal publication, the following extract is symptomatic of this recognition:

> "The same revolution which has streamlined general shipping practices holds great promise of making LOTS operations more viable and efficient than before: containerization. The high tempo of container operations transposed to the LOTS situation means greater tonnage ashore."[10]

The Marine Corps, because of its amphibious nature and total reliance on commercial maritime resupply within days after the assault, has led the way in integrating containerization into its logistics system. Despite its

initiatives, the Corps' reliance on containerization has been cautionary. Perhaps its statements on containerization for the Assault Follow-on Echelon (AFOE), as expressed in the current Marine Corps Midrange Objectives Plan (MMROP), are most revealing of its philosophy and policy:

"The Marine Corps is moving towards attaining a greatly increased capability to load supplies and equipment in standard 20 foot containers for combat deployment.

While endorsing the requirement to attain an overall containerization capability, this program should not be allowed to shackle the flexibility of the amphibious task force commander in being able to conduct assault operations against underdeveloped shorelines."[11]

While interservice cooperation has not always characterized the development of common equipment and approaches to containerization issues, a memorandum of Agreement (MOA) between the Army and Navy executed in November 1982 signals heightened recognition of service inter-dependency in future joint logistical operations. In part, it states:

"A coordinated effort is necessary to study and clarify joint inter-Service responsibility in the development, acquisition, and use of Army/Navy cargo offload and discharge systems (COLDS). This effort is required to achieve the best capability at affordable procurement and operational costs while insuring that each Service is capable of meeting all operational commitments. This Memorandum of Agreement (MOA) provides for a cooperative effort between the Director, Logistic Plans Division, USN, and the Director of Transportation, Energy, and Troop Support, USA."[12]

Clearly, COLDS will foster closer integration of the heretofore proprietary domains of the Army and Navy in container offloading; respectively, Logistics-Over-The-Shore (LOTS) and Container Offload and Transfer System (COTS).

The services have built their containerization programs around the 20-foot ISO container, consistent with DOD policy, and are necessarily disturbed by

trends in the ocean carrier industry toward larger boxes. The commercial carriers have relied increasingly on 40-foot containers (American President Line recently tested 45-foot boxes) for reasons of increased profitability. The industry's move toward "giantism;" i.e., 45-foot containers and non-self sustaining containerships in the 40,000-50,000 ton range, bodes a significant loss of military utility and flexibility, with concomitant degradation of strategic mobility. In a recent letter to the Secretary of the Navy, the Marine Corps' senior-most logistican said,

> "The Marine Corps is very concerned about the continuing trend of the U.S. ocean carrier industry toward 40-foot containers. This increased reliance on containers larger than 20-foot will have a detrimental effect upon logistics support for deployed Marine forces in war. . . .
>
> "Containers larger than 20-foot requires equipment for handling of such a size that they add substantially to lift requirements, increasing our strategic mobility problems. Further, many underdeveloped areas of the world present physical barriers to the movement of 40-foot containers (i.e., narrow streets and sharp turns; no road network or generally marginal terrain). Funding limitations do not allow for procurement of equipment to handle the larger containers, and the Force Logistics System (FLS) is committed to 20-foot containers sized components."[13]

The divergent goals of the armed services in relation to the goals of the U.S. shipping industry confront the Deparment of Defense with a pressing policy dilemma. The Marine Corps is steadfastly committed, both doctrinally and in investment, to logistical systems that utilize and support 20-foot containers. While the Army is prepared to handle containers up to 40-foot, it is restricted to 20-foot containers for ordnance. The loss of government operating and construction differential subsidies, however, has motivated U.S. commercial carriers toward fewer, larger containerships and longer containers. Apparently, profit motives and national security interests are at odds. The Marine Corps' letter cited above offers policy recommendations that

are characteristic of the kinds of issues that must be dealt with if we are to insure the availability of strategic mobility for wartime resupply:

"In view of our responsibility to respond quickly to trouble spots anywhere with no assurance of an existing container infrastructure, and with the FLS based upon 20-foot containers, it is imperative that we have the capability to transport 20-foot containers in any situation. It is requested that the necessary actions to achieve this capability be taken to include, but not be limited to, the following:

o Require as a National Defense Feature (NDF) on all new containership construction, the ability to carry 20-foot containers with minimum loss of capacity. This may involve the construction of 20-foot cell guides in 40-foot cells to accommodate two 20-foot containers without loss of capacity.

o Take action to initiate the NDF retrofitting of existing ships in the same manner as above. This retrofitting should have priority over new construction. This represents the larger and more immediate problem."[14]

A corollary to the services' concern over their ability to fully adapt to the commercial container transportation system is the failure to call into play this capability notionally during command post exercises. Because of scope and timing exercises such as Proud Spirit and Proud Saber have centered on mobilization and force projection, but have been truncated prior to a sustained resupply effort. The Office of the Secretary of Defense has acknowledged shortcomings cited by the Military Sealift Command and the Maritime Administration. In a 19 January 1983 memo to the Under Secretary of Defense (Policy) and Chairman, Joint Chiefs of Staff, the Assistant Secretary of Defense (MRA&L) said of future exercises," I am particularly interested in using the next exercise to investigate better our ability to support our forces in combat. We need to think about how we can test our sustainment capability as well as our readiness."[15]

An exercise devoted exclusively to combat sustainability, named "Pressure Point," is being planned by OJCS, J-4 (Plans) for October 1983.[16] A joint JCS-Director, Program Analysis and Evaluation effort, the DOD Sealift Study, to be completed in March 1983 is seen as an aid to exercise planning. It will assess sealift assets versus the requirements of various combat scenarios through computer simulation. This fall's sustainment exercise, hopefully a precursor for more ambitious resupply exercises, should do much to allay misgivings that our ability to provision protracted combat has been under-examined.

This chapter highlighted the ambivalence expressed by the services as they adapt to the inevitability of containerization. Of principal concern is the trend in the commercial fleet toward "giantism" and its potential effect on the services' intermodal systems. Encouraging, though, is the recent move toward greater interservice cooperation and efforts by the DOD to play combat resupply by surface strategic mobility assets in future command post exercises.

Chapter IV

CURRENT DEVELOPMENTS--SERVICE CONTAINER SYSTEMS

This chapter serves to address current development of service container systems with primary focus on hardware descriptions and capabilities.

In 1975, the Joint Container Steering Group, chaired by the Assistant Secretary of Defense (MRA&L), tasked the Army, Navy and Marine Corps with development of "Over The Shore Discharge of Containers (OSDOC)" as an integral part of the Logistics Over The Shore (LOTS) concept.

Since that time, the Army and Navy have pursued essentially parallel, if not coordinated, approaches to container discharge and transportability in the austere, expeditionary environment. The Army's approach is more doctrinally established and codified (FM 55-70, Army Transportation Container Operations), while the Navy programs have tended to be less so. Neither approach of OSDOC appears to have made satisfactory progress toward attainment of a credible capability to put a substantial force ashore by the mid-1980's. As viewed by service action officers, even if all POM initiatives and programs are realized, this capability will not be well-established before the late 1980's.

The Army's container handling capability is resident in terminal service companies of the Transportation Corps. Recognizing the criticality of possessing a capability to receive, discharge and trans-ship equipment and supplies, recent Army initiatives have resulted in positive actions to rebuild its terminal service capabilities and expertise to support deploying and deployed forces. The influx of modern container handling equipment (CHE), an increase in exercise funding and support from higher commands provide Army

terminal service units with the capability to participate in progressively larger scale logistical exercises at CONUS and overseas ports/terminals and over unimproved beach sites. The inclusion of Reserve Component units as an integral part of the task forces adds considerable credibility and realism in developing the "one Army" concept.

The scheduled introduction of the Lighterage Air Cushioned Vehicle (LACV) 30 should significantly enhance LOTS capabilities particularly at locations currently inaccessible via normal watercraft/lighterage. Other services are currently examining Army equipment for possible inclusion into their force structures. Equipment descriptions and techniques are well-documented in FM 55-70 and, accordingly, will not be addressed in detail by this paper. Suffice it to say, the Army's capability centers on large, highly specialized cranes, forklifts, De Long piers and watercraft. The dilemma of container discharge at sea has recently been eased through the decision by the Army and Navy to adopt a common auxiliary crane ship.

Because the Navy's "Over the Shore Discharge of Containers" program has been somewhat fragmented, and no single document describes it fully, a brief description here might be useful.

The Navy program, Amphibious Logistics Support Ashore (ALSA), is a coordinated Navy and Marine Corps effort for exploiting intermodal shipping trends in the merchant fleet, that is, containerization. Subsystems of ALSA are the Marine Corps' Field Logistics System (FLS), to be discussed later, and the Navy's Amphibious Logistics System (ALS).

At the heart of ALS is the Container Offloading and Transfer System (COTS), which fulfills the Navy's responsibility under ALSA for movement of

containers to the shoreline. COTS emerged from recognition that today's paucity of amphibious shipping dictated exclusive reliance on commercial vessels for transporting the Marine Corps' Assault Follow-on Ecchelon (AFOE) during amphibious operations. COTS reconciles the Marine Corps' requirement to put supplies across the beach, with the commercial carriers' trend toward fleets nearly totally comprised of non-selfsustaining containerships. The COTS program led to the development of five subsystems for the offload of these and other commercial ships in undeveloped areas where no, or limited, port facilities are available or where port access has been denied.

The Container Offloading and Transfer System subsystems and their current status, as provided by the Deputy Chief of Naval Operations, Logistics, are as follows:

a. AUXILIARY CRANE SHIP (TACS)

The Auxiliary Crane Ship (TACS) is a complete, self-deployable, container/oversized cargo discharge system capable of offloading containerships in the stream (up to sea state 3) or at unimproved ports. Its maximum capability will be to offload a 65 ton tank from the centerline hold of an alongside PANAMAX sized containership or from the main deck or stern ramp of an alongside RO/RO ship. It will also have the capability of lifting a Powered Causeway Section (90' long x 20' wide x 5' high, weighing 95 short tons) from its own deck and placing it in the water. Navy, through NAVSEASYSCOM, has entered into a Memorandum of Understanding with MARAD, who will be the agent for ship modification and installation of the crane sets. The prototype TACS was procured in FY-82 and will be operational by June, 1984. It will undergo

operational testing in the Joint Logistics-Over-The-Shore (JLOTS) II Test in the 4th Quarter, 1984. The Navy has established a requirement for 6 TACS and the Army has identified a requirement for 5. The Navy's 6 TACS are funded in POM-84, with all systems on line by 1988. Funding for Army requirement has yet to be identified.

The Joint Logistics Over The Shore (JLOTS) II Test Design says this about the TACS capability:

"From a military point of view, the TACS is a system which will support any service involved in an over-the-shore environment. The conceptual application of the TACS is uniqely suited for the JLOTS II test. Upon arrival at Camp Lejeune, the TACS will drop anchor and unload its own cargo onto lighters for transit to the beach. It will then commence offloading operations with the containership positioned along its starboard side.[17]

b. ELEVATED CAUSEWAY (ELCAS)

The elevated causeway (ELCAS) pier is the shoreside component subsystem of the Container Offloading and Transfer System. It is a pier for boats and barges equipped with a 140 ton container crane which provides the means to unload non-selfsustaining containerships, bargeships and RORO ships over-the-beach or in augmenting/restoring port capacity. It can be installed in 96 hours using assault pontoon causeways and provides two-way traffic for container loads at rates of 140-220 per day.

The introduction of the ELCAS will make available 48 U.S. Flag ships (bargeships and selfsustaining containerships) for over-the-beach movement of containers without lighterage.

Although the elevated causeway can be transported by amphibious ships (LST's), it is designed for transport on LASH bargeships when the cantilever lift interface device being developed by COSI/MARAD becomes operationally

available. Three long (3,000') double headed ELCAS's (the inventory objective) and 2 additional ELCAS's for training are funded in POM-84. Procurement commences in FY-84.

c. POWERED CAUSEWAY SECTION (PCS)/SIDE LOADING WARPING TUG (SLWT)

The PCS is similiar to the existing pontoon causeway section except that it has two diesel driven water jet engines. The PCS, by itself, or with one or more non-powered causeway sections, acts as a ferry to move containers/cargo from the TACS to the shore/ELCAS. With the addition of an "A" frame and winch, the PCS becomes a Side Loading Warping Tug to perform work boat functions in the Amphibious Objective Area (AOA). Provisional Approval for Service Use (PASU) was granted in April 1982. Eight PCS's were procured in FY-82 to allow follow on test and evaluation. 197 PCS's and 56 SLWTs are funded in PCM-84.

d. RO/RO OFFLOADING FACILITY

The RO/RO offloading facility is designed to offload all commercial RO/RO ships (with or without organic ramps) offshore, in calm water (sea state 1). The facility consists of a platform made up of causway sections for the vehicles to transit the ship's ramp onto causeway ferries for the trip to shore. An austere ramp is provided for ships that do not carry ramps. Fabrication of the facility is underway for preliminary testing to be conducted in early FY-83. Final testing will be conducted under the aegis of the JLOTS II Test in late FY-83. Four (4) RO/RO discharge facilities are funded in Navy PCM-84 with procurement to commence in FY-85.

e. LASH LIFT BEAM (CANTILEVER)

These beams are used on LASH ships, when required, to enable that ship to lift, carry and launch causeway sections and other outsized heavy components in the AOA. Naval Facilities Engineering Command has designed the beam and MARAD, under the National Defense Features (NDP) Program, has fabricated, tested and installed lift beams on the BENJAMIN HARRISON and EDWARD RUTLEDGE. Fourteen (14) beams are funded in Navy POM-84 with procurement commencing in FY-84.

A significant disparity in service container system development is the degree of emphasis placed on making organizational equipment container-compatible, configuring expeditionary shelters to ISO standards and modularizing service support equipment within container transportable housings. The Marine Corps has been the vanguard in pursuing such systems, because of the dictates of amphibious operations and its total reliance on commercial ships for resupply for the assault follow on echelon.

Since 1976, the Marine Corps has vigorously pursued a container-oriented logistical system that complements the Navy's Amphibious Logistics System (ALS), described earlier. Where ALS provides for at sea container discharge and subsequent movement ashore, the Marines' Force Logistics System (FLS) offers innovative approaches (within ISO container limitations) to the transportation and storage of supplies, shelter fabrication, and provision of combat support services. At the heart of FLS is the apparent advantage of the "principle of dimensional standardization afforded by containerization/intermodalism."[18] The system is designed around international dimensional standards in order to be able to use all modes of transportation, especially

the container-capable merchant fleet. The goals of the system are to reduce manpower, system costs, and shipping space requirements, while enhancing the effectiveness of the logistics support system and the readiness posture of Marine Corps amphibious forces.

The Marine Corps Field Logistics Systems (FLS) is an integrated program which provides intensive life cycle management of selected combat service support equipment to assure success in logistically supportable amphibious operations, while exploiting the benefits of containerization.[19] Major subsystems are:

a. Containers

The container family consists of four distinct containers, the smallest being an "insert" measuring 11" x 17" x 45" with a capacity of 120 pounds. Next is a pallet sized container (PALCON) measuring 41" x 40" x 48" with a capacity of 890 pounds. The third container is a quadruple container (QUAD CON) 6'10" x 5' x 8', able to hold 7,435 pounds. The fourth is a standard 8' x 8' x 20' commercial container. The "insert" can be used as a drawer, six per PALCON and 36 per QUADCON, or independently as a field box. The PALCON is designed to latch together in arrays of eight and eventually into an array of 24 to form a 6'10" x 8' x 20' load. The QUADCON is one quarter the size of a commercial container and when four are lashed together they form a 6'10" x 8' x 20' load. The commercial 8' x 8' x 20' container will be used for those items not compatible with the smaller units. These containers offer a number of advantages over present shipping methods. They are compatible with commercial aircraft and, by using an adapter pallet, conform to the Military

Airlift Command 463L system. The smaller containers can be efficiently used aboard amphibious shipping with a height constraint of 7'6". These containers will greatly enhance lift capability for on and off-load, over-the-shore movement and movement forward. They offer an added benefit of being accessible while embarked.

b. Shelters

The next segment of the FLS to be addressed is shelters. The Marine Corps has developed a family of seven shelters. The three largest are self contained and are packaged either in 8' x 8' x 20' or 8' x 8' x 40' foot flatracks. The other four can be characterized as innovative uses of containers. Three of these measure 8' x 8' x 20', two are rigid and one is electromagnetically shielded. The third is a knockdown unit, four of which can be packaged into a 8' x 8' x 20' load. The fourth is a 8' x 8' x 10' electromagnetically shielded unit to accommodate a smaller communications team than requires the 8' x 8' x 20'. These shelters are designed for use with existing (containerizable) generators, airconditioning and heating units. Both the 10' and 20' shelters are "complexible" and offer virtually unlimited expansion. The unshielded and knockdown shelters mate on both the 8' and 20' dimensions and the shielded shelters mate by use of a joining corridor which is a lightweight knockdown structure. These shelters provide preconfigured working and living spaces which fully conform to ISO/ANSI standards. They offer the additional benefit of being usable while embarked and would be compatible with Arapaho and TAVB, described later, as well as providing working and living space aboard any container ship.

c. Transportation and MHE

Transportation and material handling deficiencies have been the major impediment to maximum exploitation of intermodal distributions systems in the tactical, expeditionary environment. Integral to the Force Logistics System are the materiel handling equipment (MHE) and motor transport assets to efficiently and expeditiously unload containers from lighterage at the surfline, stage them in marshalling areas, transport them inland, and unstuff them at their destination.

d. Service Support Equipment

The last segment of the FLS to be addressed concerns the application of dimensional standardization to the many service support functions inherent to the force. Again there has been an enormous amount of work accomplished in configuring equipment and facilities to the shelter system previously outlined. The Marine Corps' Environmentally Controlled Medical System (MCEMS) provides a vastly ~~superior~~ improved field medical facility. It is pre-configured, operable afloat or ashore, complexible to any size, and uses current medical equipment. Modular fuel and water containers along with associated pumping facilities are being developed. The Army has developed a field water production unit that is capable of being packaged in a 8' x 8' x 10' container. A modular electric latrine is under development along with laundry and shower facilities. All are containerized, meet ISO/ANSI standards and are usable both afloat and ashore. Also under development is a complete and complexible food service unit, all in standard shelters and containers and again usable at sea as well as ashore. Also available is a battalion size food preparation

unit shelter system which will support 1000 men per hour and a refrigeration unit and refrigeration box, combined into an 8' x 8' x 10' configuration.

The items mentioned are some of the applications of ISO/ANSI standard dimensions and containerization for military use. These items are but a few of the potential applications of standard containers and shelters.

The sea services have attempted to capitalize on the increasing availablilty of containerships by developing concepts that will allow these vessels to be either temporarily or permanently modified to support tactical operations. These innovations have looked beyond the combat sustainability potential of containerships, and have recognized their suitability to fulfill current tactical deficiencies.

The systems to be described here are felt to be particularly promising in augmenting inadequate numbers of Navy vessels in the Indian Ocean/Southwest Asia theater of operations. All were designed for the projection and "front line" maintenance of combat aviation assets.

a. Arapaho

Arapaho is by far the furthest along in terms of development, having been successfully tested at sea in October 1982. Arapaho consists of a portable, modular aviation facility that is compatible with modern container-type ships. Completely self contained, this system is designed to embark aboard a merchant vessel and provide mission coverage in areas such as sea lane defense, convoy escort, mine warfare, helicopter basing, search and rescue, close air support, and evacuation. It is relatively inexpensive and adaptable to approximately 200 U.S. and NATO container ships. The system has generated

interest in the United Kingdom, Australia, Canada, the Federal Republic of Germany, Chile and the Netherlands. The tests to date have centered on helicopter operations but there is work going on to install a ski jump type runway to accommodate the AV-8 Harrier aircraft. The modular containerized concept allows the system to be loaded, set up and operating aboard a container ship in 12 to 24 hours while retaining approximately 75% of the ships normal cargo capacity.[20]

b. Shipborne Containerized Air Defense System (SCADS)

Only in the concept stage at this time, SCADS uses off the shelf equipment and bears an amazing resemblance to Araphaho. SCADS is a combined project of British Aerospace, Plessey and Fairey Engineering and is centered on the use of the Harrier aircraft. It is comprised of six elements, surveillance and air traffic control radar, a ski jump runway, Sea Harrier aircraft, Seawolf point defense missle system, a shield decoy system and a common service facility. All of these elements are containerized and deployable aboard a merchant ship within 48 hours.

c. Aviation Logistics Support Ship (TAVB)

A third system, again in the planning stages is a joint effort between the U.S. Navy and the U.S. Marine Corps. Aviation Logistics Support Ship (TAVB) provides dedicated fast sealift for an Intermediate Maintenance Activity (IMA) in support of USMC fixed and rotary wing aircraft. It is hoped to have two such ships, one each in FY 85 and FY 86, using currently available Seabridge Class RoRo vessels. The basic idea is to embark the IMA consisting of

Slant

approximately 300 vans (containers). The IMA would be activated enroute and capable of operations both enroute and in the objective area until such time as it could be moved ashore. At that time the ship is reverted to a Ro/Ro vessel for strategic lift. The TAVB concept is simplified by the fact that the bulk of the IMA is currently using the van concept and is immediately deployable. TAVB's will become an integral part of the Maritime Prepositioning Force (MPF) at Diego Garcia, and support Rapid Deployment Force operations in the Indian Ocean/Southwest Asia theater.

> In summation, various selected systems currently under development have been discussed. ~~Due to administrative constraint only selected projects have been discussed~~. The succeeding chapter delves into selected issues of concern
> which pose potential difficulties in assembling and deployment of a force abroad.

Chapter V

SELECTED ISSUES

During the course of research and interviews conducted as part of this study, various ~~facts~~ issues surfaced which appear to require additional consideration and appropriate actions to insure the best overall container handling and movement system within the Defense Transportation System. ~~These~~ Issues identified are not considered all inclusive but do represent key areas of concern which are vital to the success of the system. Discussions and recommendations regarding these key areas of concern follow:

Adequacy of Containers and Containerships

The Department of Defense (DOD) has not fully determined if current types and quantities of containers and containerships are adequate or compatible for sustainment of combat operations overseas. The significant numbers of sea containers now available through direct U.S. ownership, or potentially from foreign sources, indicate sufficiency of containers for the initial deployment of combat forces. This is particularly true since initial deployment requires significantly more roll-on roll-off and breakbulk ships than container capability. This conclusion regarding initial deployment has been confirmed by the Military Sealift Command (MSC) Container Requirements and Availability Study-84 (CRAS-84). The key question, that the CRAS-84 study was unable to answer due to reported lack of information regarding shipping requirements, is the sufficiency of containers and containerships for sustainment of overseas operations of varying sizes and duration at varying distances and directions

from U.S. shores.[21] It does not assume that a reasonable number of ships and containers will continue to be required for commercial purposes and that ships will be lost to enemy action. In fact, it would appear reasonable to assume that commercial shipping requirements might increase in support of any sigificant war effort. This unanswered question is reportedly being addressed in the Department of Defense (DOD) Sealift Study now being conducted with service representation and shipping requirements input from the service staffs.[22] This includes total requirements for ammunition and general containerized cargo in both the deployment and initial sustainment phases at overseas locations as provided in the Defense Guidance. Reasonable attrition of container ships is also planned for inclusion in the study which should be completed before the end of FY 1983.

Disturbing aspects regarding the availability of containers for military use include the U.S. industries' increasing movement from the 20 foot container (the critical container for ammunition transport) on the European and Far East trade routes, and toward the larger less militarily useful 40 and even 45 foot container; the true availability of foreign owned containers; and true commercial capability to maintain a continuous container pipeline even if empty containers cannot be rapidly evacuated.

Recommend that:

a. DOD insure that the Sealift Study include a worst case scenario that considers:

(1) Sustained operations requiring support beyond the initial deployment phases.

(2) Nonavailability of foreign owned containers because of the failure of foreign governments to support U.S. actions.

(3) Increased commercial demand for containers in order to support the war effort.

(4) Non-availability of a reasonable number of containers due to destruction or inability to evacuate.

(5) Reasonable ship attrition rates.

b. DOD consider the acquisition of additional CADS 20 foot vans to meet ammunition requirements. ~~(See related recommendation Chapter IV, page 15).~~

Sea Container Movement and Handling Policy and Doctrine

There is no policy or doctrine regarding the evacuation of empty sea containers from the theater of operations.[23] FM 54-11, Container Movement and Handling in Theater of Operations (TOPNS), provides doctrine for the inbound leg for the Army only. Specifically, containers will move as far forward as possible; there will be capability to unstuff containers at the Direct Support (DS) level; and there will be capability to unstuff and ground containers at the General Support (GS) level. Policy and doctrine is equally essential for the return of the empty container. The supply of containers is not inexhaustible and empty containers could form a very real physical obstacle or impediment to the physical distribution of stuffed containers as well as other incoming materiel. Lack of or non-enforcement of container evacuation policy during the Vietnam conflict created shortages and bottlenecks of CONEX containers. Note that, in addition to their transportation purposes, CONEX's also provided essential temporary covered and

secured storage and even "office" space. These "additional use" concepts are equally applicable ~~with~~ to sea containers for units which are arriving in the theater of operations. DOD policy and doctrine should include evacuation of empties and retention for specific purposes. U.S. Army, Europe, has identified elements of evaucation policy in Phase II of its European Containerization Study.[24] While this action is necessary and commendable it raises the question of the compatability of USAREUR policy with Military Traffic Management Command (MTMC) and Military Sealift Command (MSC) concepts of operation regarding container utilization.

Recommend that DOD take appropriate action with service participation to develop and promulgate container introduction, evacuation and retention policy and doctrine applicable to all services and establish container commodity percentages for preparation of operations plans.

Assessment of LOTS Container Capability

Analysis of the employment of containers as a principal mode of transport in a Logistic-Over the-Shore (LOTS) environment raises serious concerns which must be resolved by Army logistical planners and operators in order to adequately support deployed forces in any theater of operations.

Fundamentally, and notwithstanding the virtues of the container revolution and the reasons why a LOTS operation may be desirable or required, it is irrefutable that LOTS is a costly, and relatively inefficient method of resupply.[25]

An analysis of probable LOTS sites in potential areas of conflict, particularly in South West Asia, reveals the difficulty of LOTS employment

over unimproved terrain due to adverse beach gradient, bottom conditions, excessive distances for lighterage transport between the "mother ship" and the shore, and the absence of adequate supporting rail or road networks required for the sustainment of terminal throughput requirements. These physical barriers became more difficult to overcome with the requirement to throughput containers.

While containerization has revolutionized the transportation industry, it is currently doubtful that the armed services are able to optimize its potential due to a severe lack of manpower, technical expertise, and container handling equipment in the active and reserve forces. Active Army resources today consist of only three terminal service companies with container handling capability. There are none in the reserve structure. These units are attempting to resolve unique training and maintenance problems dealing with outsized, highly specialized container handling equipment not common in the Army inventory. This equipment includes but is not limited to the 140 ton, 250/300 ton capacity cranes; 50,000 lb. rough terrain forklift container handler; and the De Long piers. Compounding the issue is the monumental task of transporting this crucial equipment from the continental United States (CONUS) to any potential area of operation. To highlight a training issue, present operator and maintenance new equipment training (NET) for the commercial P & H 140 ton crane is conducted under contract due to the absence of facilities and expertise within the Army training base. High rotation rates of trained personnel further erode the cultivation and retention of expertise. Initiatives taken to promote tour stabilization and to train a cadre of officers and NCO's by the unit commanders are commendable but offer only temporary relief.[26]

Akin to the problems associated with the limited number of active Army containers handling units is one pertaining to the availability of engineer port construction companies which are vital to the establishment and the support of fixed terminal facilities and/or LOTS sites. This unique type unit, of which there is only one on active duty, is charged with performing special engineering tasks in support of military operations which include the missions of beach preparation/demolition; emplacement of De Long pier complexes; and the deployment of the off-shore portion of the Tactical Marine Terminal (TMT) for the movement of bulk liquid. Unlike the terminal service units which have and are currently receiving more modern equipment, the engineer company is equipped with antiquated, less reliable equipment to accomplish its missions. Successful mission accomplishments during recent training exercises in spite of this severe handicap are a tribute to the leadership, innovation, and dedication of participating soldiers.[27]

Other areas of concern pertaining to the Army's LOTS capability focus on the paucity and age of the watercraft and lighterage fleet. Relatively high levels of operational availability of assigned watercraft and expertise among the Army's mariners belie the fact that this highly specialized field is crucially lacking of mid and senior level NCOs and a repair parts supply system which can respond to the needs of an aged fleet. Active Army assets of only two medium boat companies, three heavy boat companies, one LARC LX detachment, one LACV 30 company, one floating craft company, and one floating craft general support maintenance company are marginally capable of supporting any sizeable deployed force solely given a LOTS environment even if transportable to the theater of operations.[28]

The inherent inefficiencies and difficulties associated with the concept of LOTS employment even in a "benign environment," under ideal conditions are multiplied and complicated significantly when executed under conditions of hostility. Optimistically, LOTS is marginally efficent under controlled conditions; inclusion of adverse weather, excess of sea state condition 2, and the operational/defensive constraints induced by hostile waterborne and airborne attacks would severely degrade or would render LOTS totally ineffective in a "hot" environment. Recommend that:

a. Studies and development of concepts to employ resources currently included in LOTS operations to restore/repair/expand existing fixed terminal facilities in a Theater of Operation be given priority over the employment of these forces in the conduct of LOTS over unimproved terrain. Actions must be pursued to upgrade the force structure of Army units specializing in transportation terminal operations and port construction to ensure the sustainability of the forces ashore in the event LOTS must be employed in its pure form.

b. Although not specifically addressed, planners must also examine the capability of military motor transport units and commercial railroads to linehaul containers to and from inland destinations; evaluate whether consignees possess container handling and unstuffing Material Handling Equipment (MHE); and develop plans for container control and retrograde.

Availability of Intact Container Ports

Current Department of Defense planning assumptions regarding the availability of fully operable container handling ports in the Area of Operations (AO) are unrealistic. Given the state of advanced weapon

technology today, it appears inconceivable that any part of the world could remain totally immune to interdiction or threat thereof. Enemy strategists and tacticians realize the importance of severing the combat forces' "logistical tail."

Water terminals, as well as aerial and inland ports, roads and railroads, are prime targets for interdiction. Denial of fixed water terminals capable of discharging non-self sustaining container vessels (the bulk of today's fleet) would dictate a LOTS operation, thus severely degrading throughput capability. Recommend that Department of Defense planners:

a. Concentrate on actions which would result in minimizing damages to existing container handling fixed port facilities.

b. Develop plans and add units capable of building or rebuilding ports capable of discharging these non-self sustaining container ships to the force structure.

c. Develop plans to provide tactical security for Combat Service Support (CSS) units operating port complexes.

Transportability of New/Modernized Equipment In Sea Containers

The question of the compatability of all classes of supply, to include major end items of equipment, with containers is multifaceted. It encompasses handling, specialized containers, and interchangeability as well as the issues of equipment design to container specifications, container design to accommodate outsized cargo and maximize ship capabilities, and identification and prioritization of containers.

a. Equipment design to container specifications, must be addressed at the very conceptualization of an item of military equipment. DOD and Army policy regarding design of new or modernized equipment to be sea container compatible is weak. Joint Regulation AR 70-44 provides that "where practicable" systems/equipment/munitions (SEM) will be compatible with standard cargo containers and that shelters and special purpose vans will conform to standard container specifications "to the extent practical." It also provides that the objective is to assure that SEM, including components and spare parts, are designed, engineered, and constructed so that the required quantities can be efficiently moved by available means of transportation.[29] AR 70-47 which supplements the Army portion of AR 70-44 provides that "where feasible" materiel should be designed to be compatible with standard cargo containers. Appendix C of the same regulation indicates that, due to the trend toward countainerships, all materiel should "if possible" be designed to move in standard cargo containers.[30] Army regualations regarding Integrated Logistics Support (ILS); the Systems Acquisition process; and the duties of the Department of the Army Logistics Staff Officer (DALSO), the individual on the Army Staff who is to insure the accomplishment of all ILS aspects, do not strengthen the Army position regarding this issue of container compatible design. A review of the Army Modernization Information Memorandum (AMIM) indicates a number of items whose dimensions do ~~not~~ significantly exceed those for the standard forty foot sea container while their weights are compatible. This raises the question if the issue of container compatibility was actively considered and consciously rejected during the design of the Army's new or modernized items of equipment. The Office of the Deputy Chief of Staff,

Logistics, Headquarters, Department of the Army, recognizes the criticality of equipment size and weight to mobility and is working to insure its active consideration during the acquisition process. Recent emphasis by the Office of the Deputy Chief of Staff, Operations, strengthens efforts to insure equipment compatibility with military aircraft, however, the same emphasis has not been evidenced regarding equipment compatibility with sea containers.

The Marine Corps has an excellent example, as cited earlier, of equipment designed to container specification ~~with~~ in its family of shelters. The "family" consists of seven shelters all conforming to International Organization for Standardization/American National Standards Institute (ISO/ANSI) dimensions. The thrust of this issue is not ~~meant~~ to imply that sea container compatibility should drive equipment design but, if container compatibility is achievable with no or even slight loss of effectiveness, should it not be consciously considered during the RDTE funded portions of the acquisition process. This also raises the question of the ~~true~~ desireable versus actual degree of participation by the logistician for all ILS aspects during the concept exploration and full scale development phases of the acquisition process. In the final analysis, the best equipment is useless if it does not get to the war. Its potential for getting there increases if it is containerizeable.

Recommend that appropriate regulations be revised to require that new or modernized equipment be sea container compatible unless doing so would significantly degrade equipment effectiveness. This issue should be specifically addressed during the logistics portion of the service and DOD Systems Acquisition Review Council. It would also be appropriate to update AR 70-47 in order that it truly serve as a "supplement" to Joint Regulation AR 70-44.

b. The second issue involves container modifications designed to permit use of containerships for outsized cargo. Container modifications consist of the flatrack and the seashed. Flatracks are, in essence, platforms which fit in existing containership cell guides and are stackable like standard containers. The ability to use three heavy duty flatracks in parallel permits carrying outsized cargo to include tanks. The sea-shed concept centers on a large frame unit the size of approximately three 40 foot flatracks which affords the advantage of loading/offloading through the floor. Designed to carry 110 short tons and stackable four high, the sea-shed is a highly versatile asset also capable of accommodating large tracked and wheeled vehicles. The use of either flatracks or sea-sheds provides the flexibility of utilizing containerships in the breakbulk mode.

There is ongoing discussion within DOD elements regarding the relative advantages and disadvantages of the sea shed versus the flat rack as to which better serves defense requirements. The rapidly declining number of breakbulk ships and the limited availability of roll-on/roll-off ships coupled with the increasing availability of containerships has prompted DOD to encourage these types service efforts to develop methods by which containerships can be utilized to carry non-container compatible cargo. The seashed and the flatrack are both capable of accomplishing the basic goal. Since the flatrack has little commercial utility, commercial availability is extremely limited and commercial carriers are not interested in increasing current stocks to satisfy military requirements. There are no seasheds available with the exception of military prototypes. Available information indicates that the Navy has programmed resources for the Military Sealift Command (MSC) in the 1984

Program Objective Memorandum (POM) dated 12 May 1982 to purchase 2,282 modified heavy duty flatracks for $6.3 Million ($27.7 Thousand each) and 1,496 sea sheds for $238.2 Million ($159.2 Thousand each).[31] Each alternative has certain advantages and disadvantages. The seashed does not have to be removed for ship discharge since its floor folds up to give access to the cargo below, while the flatracks would have to be at least partially removed to gain access to cargo stored below. There should be some discharge time saving associated with the seashed. There does appear to be a legitimate issue regarding which alternative provides the more cost effective storage in terms of square feet of true storage/tie down space in view of potential wasted space caused by seashed cross members. The Army staff and the MTMC Transportation Engineering Agency (TEA) are initiating action to examine this aspect. The significant advantage of the flatrack is its cost and reduced maintenance requirement. Since one seashed is generally the equivalent of three flatracks, the 1,496 seasheds in the Navy POM equate to 4,488 flatracks in terms of storage space. On the other hand, the resources allocated for seasheds could buy at least 8,599 flatracks. Since a large containership carries approximately 1,000 containers, the difference is that four additional containerships could be converted for breakbulk cargo by using all currently available resources to purchase flatracks. Studies by TEA indicate that heavy duty flatracks may be available for less than $27.7 thousand each which, if supported, would increase the number of containerships which could be converted for contingency purposes.[32] Another significant advantage of the flatrack is that it does not require any ship modification as does the seashed with attendant time and resource requirements. The requirement for

ship modification may reduce the pool of available ships during anything less than full mobilization due to shipowner reluctance to have their ships modified. Since flatracks and/or seasheds would not be used to any significant degree except during a national emergency, it would appear that the flatrack offers DOD the most cost effective alternative.

Recommend that DOD independently examine the seashed versus flatrack issue to insure procurement of the most cost effective system.

c. The third issue is the need for a proven, deployable and survivable container management system which will permit the tracking of shipment units within containers from origin to ultimate consignee. This need becomes more critical as container ships continue to increase in capacity and wartime diversion of selected commodities becomes necessary. The ability to identify and selectively off load and/or divert containers would enhance combat operations. Sealand Corporation has an automated system which controls and manages containers world-wide and provides detailed contents listings. It is imperative that the military services develop a deployable real-time container management system which would provide the required management information.

Recommend that DOD examine the Sealand container control system with the goal of getting a real-time military system in operation rapidly which would permit wartime container control and diversion.

During the course of research and interviews, ideas regarding possible hardware innovations and improvements or managerial techniques also surfaced. These are presented in the next chapter.

Chapter VI

INNOVATIONS AND IDEAS FOR ADDITIONAL CONSIDERATION

Discussions and visits with DOD, JCS, and various service agencies and activities as well as review of available publications on the subject of containerization have prompted various thoughts not specifically related to earler discussions. These will be presented for the purpose of stimulating additional reflection and appropriate action.

a. Consideration should be given to the design and utilization of 20 foot or 40 foot flatracks for the sea and land transportation of ammunition. Such flatracks would offer the alternative of ship discharge in the breakbulk mode or, if discharged intact, could be transported inland where they could be unloaded without the aid of special container handling unstuffing equipment. Design with fold down corner posts would afford versatility for stacking.

b. A potential problem area which needs to be considered is the availability of container chassis. For example, DOD is getting 4,000 sea containers associated with the SL-7 (TAKR) containership purchase and conversion program but only 800 chassis. It is reasonable to assume that, at least in the early stages of a conflict, container handling equipment will be in short supply. To insure mobility of arriving containers and evacuation of unstuffed containers, DOD planners should plan to ship chassis and establish a high ratio of chassis to containers during the initial deployment to insure rapid delivery to supported units and evacuation of unstuffed containers, and to prevent port conjestion.

c. An area for Army consideration is the requirement for temporary office and covered storage space. Significant progress has been made by the Marine

Corps in the design and development of modular office and support and storage facilities complete with appropriate electrical hookups, windows, and other ventilation features.

d. In a LOTS environment, the retrograde of containers may be extremely difficult or impractical. Therefore, the feasibility of inexpensive disposable containers should be investigated.

e. Consider establishment of a large DOD "superfund" to allocate toward or encourage those service projects or initiatives which demonstrate service commitment and/or promise big payoffs in terms of container movement and handling preparedness.

f. To insure the availability of types and amounts of containers which do not enjoy commercial popularity, DOD should investigate the desirability of subsidizing commercial firms as an inducement for their procurement of the containers needed by the military with the guarantee of availability for military use when required.

Considerations listed above are presented to stimulate discussion and actions to more fully exploit the opportunities offered by containerization.

Chapter VII

CONCLUSION

In the current strategic environment, a ~~credible statement~~ projectible, sustainable force is crucial to national survival. The force is credible only if it is deployable. Thus, logistics becomes increasingly important and it must be a primary consideration in the overall capability of the nation to protect its worldwide interests. A vital element of the armed forces logistics preparedness is its ability to fully exploit the container revolution to its potential.

From the foregoing discussion, however, it is apparent that, while containerization has been revolutionizing the commercial transportation industry, the Department of Defense has not fully kept pace. This fact is particularly evident in a scenario which requires major unit deployments, non-self sustaining containership discharge, and the inland movement of containers without benefit of fixed marine terminal facilities.

The review of DOD and service policies and accomplishments to date leads to the conclusion that central direction and control have been lacking. In addition, ~~to~~ less than desirable service interaction and coordination have resulted. In spite of the fact that the services are not yet prepared to conduct sustained large scale container operations in an "over-the-shore" scenario, the Joint Inter-modal Steering Group has been reduced to once a year meetings on the premise that the services know what each should do and are fully committed to that end. Based on interviews conducted during this study, that simply does not appear to be the case. Nor does it appear that sufficient service priority and resources are being allocated to resolve ~~these~~ their container-related problems in the near term.

Discussion and recommendations presented in Chapters 5 and 6 regarding selected issues and innovations are provided to assist DOD in the resolution of problem areas identified. Responsive actions by DOD ~~on the part of DOD~~ now to fully incorporate the tremendous potential offered by containerization will serve to alleviate the awesome challenges of mobilization and sustainment of overseas committed our forces.

FOOTNOTES

[1]"Containerization Considerations;" point papers by the Marine Corps' Advanced Amphibious Study Group of March 1982; enclosure (2) p. 2-1.

[2]Interview with Colonel Harry Stevenson, Assistant for Surface Transportation, Director of Transportation and Distribution Policy, OASD (MRA&L), 24 January 1983.

[3]Ibid.

[4]DODI 4540.xx; DOD Project Master Plan For A Container Oriented Distribution System (Draft).

[5]DODD 4540.6 of 30 July 81; Intermodal Systems Development.

[6]Ibid.

[7]Ibid.

[8]"Increased Readiness & Efficiency," by Frank Carlucci; Defense 82, October 1982, p. 15.

[9]Ibid.

[10]FM 55-70, Army Transportation Container Operations, p. 6-1.

[11]Marine Corps Midrange Objectives Plan (MMROP), FY-84 p. VI-3-4.

[12]Memorandum of Agreement between the Department of the Navy and the Department of the Army for Development and Utilization of Cargo Offload and Discharge Systems (COLDS) of 2 November 1982.

[13]Letter from DC/S for Installations and Logistics, USMC to the Secretary of the Navy , 26 July 1982.

[14]Ibid.

[15]ASD(MRA&L) Memorandum of 19 January 1983; Subject: Exercises.

[16]Interview with Colonel David Shroyer, USMC, OJCS, J-4 (Plans), 25 January 1983

[17]JLOTS II Test Design, p. 31.

[18]Test and Evaluation Plan No. 299 (Temp) for Container Offloading and Transfer System (COTS), p. I-1.

[19]Field Logistics System Status Report, December 1982, p i.

[20]Mulquin, James J., ARAPAHO, Naval Aviation News, February 1983.

[21]Military Sealift Command, Container Requirements and Availability Study (Washington D.C.: September 1982), p. V-5.

[22]Interview with Major F. Tricomi, Office of Strategic Mobility, Deputy Chief of Staff Logistics, Headquarters, Department of the Army, Washington, D.C.: 28 January 83.

[23]Telephone conversation with Colonel J. Lawler, Headquarters Military Traffic Management Command, 27 January 83.

[24]Telephone conversation with Colonel L. Masters, Headquarters, Military Traffic Management Command, 27 January 83.

[25]FM 55-70 Army Transportation Container Operations p. 28.

[26]Interview with Captain Zamecnik, Headquarters, 7th Transportation Group (TML), Ft. Eustis, Va 23604. 27 January 1983.

[27]Interview with Major(P) Crawder, Headquarters, 7th Transportation Group (TML), Ft. Eustis, Va 23604. 24 January 1983.

[28]Interview with Captain Zamecnik, Headquarters, 7th Transportation Group (TML), Ft. Eustis, Va 23604. 24 January 1983.

[29]Joint Regulation AR 70-44, DOD Engineering for Transportability, 1 September 1978, p. 1.

[30]Army Regulation 70-47, Engineering for Transportability, 28 January 1976, paragraph 4/Appendix C.

[31]Interview with Lieutenant Colonel D. Whaley, Office of Strategic Mobility, Deputy Chief of Staff Logistics, Headquarters, Department of the Army, Washington, D.C.: 28 January 83.

[32]Transportation Engineering Agency, Military Traffic Management Command, Flatracks for Unit Deployment, November 1980, p. 7.

BIBLIOGRAPHY

Articles

Carlucci, Frank. "Increased Readiness and Efficiency," Defense 82, October 1982, p. 15.

Carrol, Kent J. Vice Admiral, USN, "Sealift the Achilles Heel of American Mobility, Defense 82, August 1982, p. 8-13.

Harp, James J. Colonel, USMC," Marine Corps Transportation, Lean and Mean," Defense Transportation Journal, October 1977, p. 12-19.

Interviews

Bergeron, S., Captain. (USA) Plans Officer, MTMC TEA Interview, 24 January 1983.

Crowder, William, Major(P) (USA) S-3, 7th Transportation Group (TML). Interview, 24 January 1983.

Case, Frank. National Security and Plans, Maritime Administration, Department of Transportation. Interview 8 April 1983.

Ekstrom, James, Captain, USN. Strategic Mobility Operations Division, OJCS (J-4). Interview 7 September 1982.

Fong, Thomas, Major, USMC. Transportation Section, Facilities Division, DC/S, Logistics, HQMC. Interview 25 January 1983.

Gifford, Corry, Commander, USN. Readiness Office, Military Sealift Command, Interview 20 October 1982.

Howard, Kenneth. International Trade Division, Military Traffic Management Command. Interview 19 October 1982.

Johnson, James. Projection Forces and Analytical Support Direct, Program Analysis and Evaluation, OSD. Telephone interview 25 January 1983.

Kerr, Richard, Lieutenant Colonel, USMC. Mobility and Logistics Division, Marine Corps Development Center. Interview 22 October 1982.

Krattick, Howard. Readiness Office, Military Sealift Command. Interview 20 October 1982.

Mancuso, F., Lieutenant Colonel (USA) Staff Officer, USATSCH, Interview 25 January 1983.

Mulqueen, James. Advanced Weapon System Division, Naval Air Systems Command. Interview 24 January 1983.

Nead, G., Colonel (USA) Director of International Traffic, MTMC Eastern Area Interview 29 November 1982.

Pegre, M., Colonel (USA) Commander, 7th Transportation Group (TMC), Interview 24 January 1983.

Piner, J., Brigadier General (USA), CG MTMC Eastern Area, Interview 29 November 1982.

Riggs, Robert. Head, Requirements Section, Materiel Div., DC/S Logistics, Headquarters Marine Corps. Interview 25 January 1983.

Shoults, Eugene E., Colonel, USMC. Marine Corps Advisor, Amphibious Ship Acquisition Projects, Naval Sea Systems Command. Interview 24 January 1983.

Shroyer, David, Colonel, USMC, Plans, Programs and Mobilization Branch, OJCS (J-4). Interview 25 January 1983.

Stevenson, Harry, Colonel, USA, Office of Transportation and Distribution Policy, OASD (MRA&L). Interview 25 January 1983.

Toth, James, Colonel, USMC, Director, Marine Corps Advanced Amphibious Study Group. Interview 22 October 1982.

Troy, Thomas, Commander, USN, Logistics Plans Division, Deputy Chief of Naval Operations (Logistics). Interview 25 January 1983.

Weisflog, J., Lieutenant Colonel (Ret), Staff Officer, USATSCH. Interview, 25 January 1983.

Zamecnik, D., Captain (USA), Plans Officer 7th Transportation Group (TMC). Interview, 24 January 1983.

U.S. Government Documents

Instructions

U.S. Department of the Army, Army Transportation Container Operations, FM 55-70, June 1978.

U.S. Department of the Army; DOD Engineering for Transportability, AR 70-44, September 1978.

U.S. Department of the Army; Engineering for Tranportability January 1976.

U.S. Department of Defense; DOD Project Master Plan For A Container Oriented Distribution System (draft), DODI 4540.xx, undated

U.S. Department of Defense; Intermodal Systems Development, DOD Directive 4540.6, July 1981.

Letters and Memoranda

U.S. Department of Defense; ASD (MRA&L), "Exercise," 19 January 1983.

U.S. Marine Corps, DC/S (Installations and Logistics) to SECNAV, 26 July 1982.

Plans

U.S. Marine Corps. Midrange Objectives Plan (MMROP) FY-1984, January 1983.

Point Papers

U.S. Department of the Army. Military Transportation Management Command, Transportation Engineering Agency, Flatracks for Unit Deployment, November 1980.

U.S. Marine Corps, Advanced Amphibious Study Group Point Papers. Containerization Considerations, March 1982.

U.S. Marine Corps, Headquarters Marine Corps (Code LM), Amphibious Logistics Support Ashore, July 1979.

☆ U.S. GOVERNMENT PRINTING OFFICE : 1983 O - 425-560 (30)


FILME
3-84