Joint Publication 4-01.6

Joint Logistics Over-the-Shore (JLOTS)

5 August 2005

PREFACE

1. Scope

This publication establishes joint doctrine for the conduct of joint logistics over-the-shore (JLOTS) operations across the range of military operations. This publication also includes procedures concerning the transition from amphibious operations to a JLOTS operation.

2. Purpose

This publication has been prepared under the direction of the Chairman of the Joint Chiefs of Staff. It sets forth joint doctrine to govern the activities and performance of the Armed Forces of the United States in operations and provides the doctrinal basis for interagency coordination and for US military involvement in multinational operations. It provides military guidance for the exercise of authority by combatant commanders and other joint force commanders (JFCs) and prescribes joint doctrine for operations and training. It provides military guidance for use by the Armed Forces in preparing their appropriate plans. It is not the intent of this publication to restrict the authority of the JFC from organizing the force and executing the mission in a manner the JFC deems most appropriate to ensure unity of effort in the accomplishment of the overall objective.

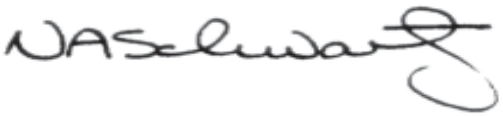
3. Application

a. Joint doctrine established in this publication applies to the commanders of combatant commands, subunified commands, joint task forces, subordinate components of these commands, and the Services.

b. The guidance in this publication is authoritative; as such, this doctrine will be followed except when, in the judgment of the commander, exceptional circumstances dictate otherwise. If conflicts arise between the contents of this publication and the contents of Service publications, this publication will take precedence unless the Chairman of the Joint Chiefs of Staff, normally in coordination with the other members of the Joint Chiefs of Staff, has provided more current and specific guidance. Commanders of forces operating as part of a multinational (alliance or coalition) military command should follow multinational doctrine and procedures ratified by

the United States. For doctrine and procedures not ratified by the United States, commanders should evaluate and follow the multinational command's doctrine and procedures, where applicable and consistent with US law, regulations, and doctrine.

For the Chairman of the Joint Chiefs of Staff:



NORTON A. SCHWARTZ
Lieutenant General, USAF
Director, Joint Staff

SUMMARY OF CHANGES
REVISION OF JOINT PUBLICATION 4-01.6, DATED 12 NOVEMBER 1998

- **Updates the definition of logistics over-the-shore (LOTS) operations**
- **Defines and discusses multinational LOTS operations**
- **Adds a discussion of Air Force responsibilities during joint logistics over-the-shore (JLOTS) operations**
- **Discusses maritime pre-positioning force and afloat pre-positioning force operations in JLOTS operations**
- **Provides greatly expanded detail on JLOTS operations following amphibious operations**
- **Adds a discussion of environmental conditions as planning considerations**
- **Updates the coverage of JLOTS systems, facility installations, and preparations**
- **Provides detail on the new cargo control and documentation systems**

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EXECUTIVE SUMMARY
COMMANDER'S OVERVIEW

- **Provides an Overview of Logistics Over-the-Shore Operations**
- **Discusses the Organization and Command of Joint Logistics Over-the-Shore (JLOTS) Operations**
- **Covers Planning of JLOTS Operations**
- **Discusses JLOTS Systems, Facility Installations, and Preparations**
- **Covers JLOTS Ocean Transport, Ship Discharge Operations, and Lighterage Operations**
- **Discusses JLOTS Shoreside Cargo Discharge Operations, Beach and Port Clearance and Marshalling Operations, Cargo Control and Documentation, and Liquid Cargo Offshore Operations**

Overview

Joint logistics over-the-shore (JLOTS) operations are normally conducted in a low threat environment. Primary threats to consider are air and rocket attacks, attack by adversary ground forces, guerrillas or insurgents operating behind the lines, and sabotage. Chemical, biological, radiological, nuclear, and high-yield explosives warfare is considered possible.

Logistics over-the-shore (LOTS) is the process of loading and unloading of ships without the benefit of deep draft-capable, fixed port facilities; or as a means of moving forces closer to tactical assembly areas.

The scope of the LOTS operation will depend on geographic, tactical, and time considerations. A **LOTS operation area** (LOA) is the geographic area required to conduct a LOTS operation.

Joint logistics over-the-shore (JLOTS) operations occur when Navy and Army LOTS forces conduct LOTS operations together under a joint force commander (JFC). Traditionally Navy LOTS includes the use of United States Marine Corps forces. **Generally, LOTS operations will be joint in all but a few exceptions.**

The scope of JLOTS operations extends from acceptance of ships for off-load through the arrival of equipment and cargo at inland staging and marshalling areas.

Organization

Forces assigned to conduct the JLOTS operation are organized by the joint force commander.

The JLOTS forces are normally organized along Service lines, but can also follow functional lines, with Service elements integrated under the tactical control (TACON) of the JLOTS commander.

Geographic combatant commanders have overall responsibility for JLOTS operations in their areas of responsibility. United States Transportation Command (USTRANSCOM) forces, when attached to the supported geographic combatant commander, will normally also be under TACON of the JLOTS commander. The geographic combatant commander may delegate authority to subordinate JFCs in the conduct of their assigned missions.

Each **Service component** has personnel and equipment necessary for the conduct of LOTS operations. During the planning for and execution of JLOTS operations, each Service component will furnish such equipment and perform those tasks required by the operation plan and operation order (OPORD) or as directed by the JFC during OPORD execution.

The JLOTS commander is responsible for detailed planning and execution of JLOTS operations.

The JLOTS commander will accomplish detailed planning and execution of JLOTS operations through a central planning team composed of representatives from participating Service and USTRANSCOM components. **Principal responsibilities of the JLOTS commander include:**

Publishing an OPORD or directive that states responsibilities and describes procedures for the conduct of the JLOTS operation.

Handling JLOTS execution, beginning with acceptance of ships for off-load, through the arrival of equipment and cargo at inland staging and marshalling areas.

Coordinating over-the-shore liquid cargo operations. For the offshore petroleum discharge system (OPDS), responsibility includes acceptance of OPDS vessels and the installation and operation of OPDS to its termination point on the beach, where it interfaces with the inland petroleum distribution systems and the amphibious assault fuel system.

Command and Control Relationships

***Command and control relationships are as prescribed by Joint Publication 0-2,* Unified Action Armed Forces (UNAAF).**

In an amphibious operation, command and inter-Service relationships will be guided by Joint Publication 3-02, *Joint Doctrine for Amphibious Operations*.

In JLOTS operations, Service elements must be integrated under one JLOTS commander who normally has TACON authority to direct JLOTS operations. Service elements should be employed in a manner consistent with their training, unit, and job description. The senior member of each Service should be afforded access to the JLOTS commander.

Specific JLOTS operations will be identified by the JFC during concept development. At that time, tentative JLOTS sites will be selected and force requirements identified. Landing sites will be selected by agreement between the supporting Navy component commander and the JLOTS commander and will be approved by the JFC. The JLOTS commander is responsible for consideration of the inland access requirements.

The JLOTS commander will coordinate the positioning of ships for JLOTS operations at the selected landing sites with the supporting Navy component commander, in accordance with priorities established by the JFC.

Planning JLOTS Operations

Planning for JLOTS operations is complicated by the need for detailed coordination between the various Service forces involved, the complex logistic activities, joint command relationships, geographic distance between ships and marshalling yards, and other peculiar operational factors.

Planning procedures used by the JLOTS commanders should follow those outlined in the 5-0 series of joint publications. Because many of the planning problems are of mutual concern to all participants, **concurrent planning is necessary**. The allocation of resources, such as available shipping, lighterage, ship-to-shore transfer systems, and LOTS equipment, will be based on the amount of equipment, dry cargo, bulk fuel, and water that must be discharged to meet the needs of supported forces. The plans of supported forces must be sufficiently advanced to provide a basis for determining requirements and for setting discharge priorities.

The combatant commander should select the LOA in conjunction with the JLOTS commander to best support the JFC's concept of operations. Other factors to consider include the availability of facilities

for off-load, transportation routes, proximity of airfields, and the general operating environment (sea state, surf index, and beach gradient).

Throughput is the average movement of containers, wheeled vehicles, tracked vehicles, breakbulk cargo, and bulk liquid cargo that can pass through a port or beach daily. The JLOTS commander's goal, when planning for throughput, should be to keep cargo continuously moving from the ships through the marshalling yards to the port complex exit. Continuous movement of cargo is a key factor for efficient and effective throughput operations.

JLOTS Systems, Facility Installations, and Preparations

The establishment of JLOTS capability requires a period of preparation and facility installation that will precede the startup of JLOTS operations.

The JLOTS commander must ensure that all available data for a JLOTS operational area be thoroughly researched and validated with a site survey. **A concept of operations** should include a detailed soil analysis, prevalent weather conditions, beach gradient, tides, tidal range, currents, and water depth. These factors are further defined as a part of the site survey.

The Navy's cargo off-load and discharge system is comprised of the container off-loading and transfer system (COTS) and the offshore bulk fuel system. The COTS system, described here, contains a number of subsystems that are being procured by both the Army and Navy.

Army LOTS equipment includes lighterage, roll-on/roll-off discharge facilities, causeway systems, cargo transfer and port operations cargo units' materials handling equipment, shore-based water storage systems, and a tactical petroleum terminal. The majority of construction equipment will be provided by supporting engineer units.

JLOTS Ocean Transport, Ship Discharge Operations, and Lighterage Operations

Strategic sealift is the principal delivery means for the equipment and logistic support of land forces.

Strategic sealift employed in support of JLOTS operations includes Military Sealift Command common-user ships, US Maritime Administration-owned vessels, namely the Ready Reserve Force vessels, and pre-positioning ships. These ships are capable of conducting port operations and LOTS operations from anchorage. They deliver cargo in accordance with requirements based on cargo required delivery dates, the tactical situation, and ship capability and availability.

Cargo off-loading is an essential element of the strategic sealift mission.

Cargo off-loading of strategic sealift ships may be conducted by Navy and/or Army forces augmented by civilian ship crews and select Marine Corps support personnel. Subject to the requirements of the appropriate JFC, **any of the Service components may be directed to provide forces and equipment to augment the other Service component for JLOTS operations.** The Navy has the primary responsibility for providing forces and equipment and conducting strategic sealift cargo discharge operations incident to amphibious operations and maritime pre-positioning force deployments. Through its Army component, Surface Deployment and Distribution Command, USTRANSCOM provides the single port manager for all common-user seaports worldwide.

The JLOTS commander will designate responsibilities for control of lighterage in the JLOTS operation order.

Assignment of lighterage control responsibilities will be heavily dependent on the type of units available (Army or Navy) to conduct discharge operations. The procedures for control of lighterage in JLOTS have been standardized through incorporation of both Army and Navy methods.

The **joint lighterage control center (JLCC)** operates under and reports to the JLOTS commander or designated representative. When the operation commences, the JLCC will be the key coordinating body for management and modification of lighter usage plans based on requests by the debarkation officer through the **ship lighterage control point** (SLCP). Personnel manning the SLCP should have an excellent working knowledge of lighter cargo capacities, deck loading configurations, lighter communications capabilities, and operating speeds. Additionally, they should be knowledgeable of the cargo ships that will be used during operations and they should know how to optimally use assigned lighters at the ships discharge points. Personnel manning the **beach lighterage control point** should be very familiar with lighter discharge operations involving the use of floating causeway piers, elevated causeway piers, amphibian discharge sites, and bare beach sites. Additionally, a working knowledge of beach clearance systems is beneficial.

JLOTS Shoreside Cargo Discharge Operations, Beach and Port Clearance and Marshalling Operations, Cargo Control and Documentation, and Liquid Cargo Offshore Operations

The mission to conduct cargo discharge operations includes the interfacing of transportation modes in the surf zone, seaward of the surf line, and on the beach.

Although most roll-on/roll-off transported equipment can be driven off ship-to-shore lighterage, other dry cargoes are discharged by specialized off-load equipment and either placed on a land vehicle for further transport or carried directly to an appropriate area. Such transfers can be accomplished at the beach or onto a platform that is connected with a beach. **Air cushioned watercraft and amphibians**, on the other hand, are capable of transporting cargo directly to a marshalling area, thus eliminating a transfer at the shoreline.

Beach throughput is dependent on receipt, transfer, and clearance rates.

The ability to clear cargo from a beach depends upon the physical features of the beach, weather, oceanographic features, the tactical situation, and the organization and equipment of the beach clearance units assigned to the operations. To obtain beach throughput effectiveness, clearance units must reach and maintain maximum transfer and clearance rates.

JLOTS is a unique and demanding military operation requiring the benefit of the best available cargo control documentation methods and procedures.

The Department of Defense (DOD) uses **DOD 4500.9-R, *Defense Transportation Regulation, Part II Cargo Movements***, to provide specific guidance for documenting cargo movements. Specific Service cargo control and documentation systems that are used to receive and process DOD 4500.9-R, *Defense Transportation Regulation*, data in a JLOTS operation include the Marine air-ground task force Logistics Automated Information Systems, and Worldwide Port System.

The JLOTS commander is responsible for offshore bulk fuel system operation.

The JLOTS commander responsibility for offshore bulk fuel system operation **begins with the reception of offshore bulk fuel system (OBFS) or OPDS vessels and extends to the installation and operation of OBFS to their termination point on the beach.** For OPDS, the termination point is the beach termination unit that interfaces with the Army inland petroleum distribution system and the Marine Corps amphibious assault fuel system.

Conclusion

This publication establishes joint doctrine for the conduct of JLOTS operations across the range of military operations. This publication also includes procedures concerning the transition from amphibious operations to a JLOTS operation.

CHAPTER I
AN OVERVIEW OF LOGISTICS OVER-THE-SHORE OPERATIONS

"I believe that the task of bringing the force to the fighting point, properly equipped and well-formed in all that it needs, is at least as important as the capable leading of the force in the fight itself."

General Sir John Monash, 1865-1931
quoted in Horner, *The Commanders*, 1984

1. Purpose

a. This publication establishes joint doctrine for joint logistics over-the-shore (JLOTS) operations. **JLOTS operations are conducted in support of the joint force commander's (JFC's) campaign or operation to achieve assigned objectives.**

b. This publication

(1) Outlines the missions and responsibilities of the JFC and Service component commanders relative to JLOTS operations.

(2) Describes the communications systems of cargo discharge organizations.

(3) Provides guidance for the planning of cargo discharge operations, whether routine or emergency.

(4) Provides guidance for preparation of both the strategic sealift assets involved and the receiving beach or underdeveloped port area.

(5) Describes lighterage control, movement, and concepts of employment.

(6) Describes shoreside components of the cargo discharge systems, their installation, capabilities, limitations, equipment, and special considerations.

(7) Describes the equipment, techniques, and procedures used in the ship-to-shore movement of liquid cargoes.

(8) Defines cargo documentation requirements.

2. Applicability

a. The throughput capability described in this publication is based upon empirical data observed and obtained through tests, exercises, and operations and minimal extrapolation. The joint task force commander must appreciate the degree to which throughput can be degraded by inadequately trained or equipped forces. The JLOTS commander must be apprised of the training and materiel status of the JLOTS forces and make careful adjustments to anticipated throughput planning factors as necessary.

b. This publication does not include doctrine for maritime pre-positioning force (MPF) operations or amphibious operations, which are the subject of separate publications: Joint Publication (JP) 3-02, *Joint Doctrine for Amphibious Operations*; Naval Warfare Publication (NWP) 4-01.1, *Navy Expeditionary Shore-Based Logistic Support and Reception, Staging, Onward Movement, and Integration Operations*; and Marine Corps Warfighting Publication (MCWP) 3-32/Naval Tactics, Techniques, and Procedures (NTTP) 3-02.3M, *Maritime Pre-positioning Force Operations*. However, this publication does include procedures concerning JLOTS operations as follow-on operations after an amphibious operation.

3. References

Additional information may be found in the doctrinal publications or Service regulations listed in Appendix O, "References."

4. Peacetime Responsibilities of the Services and the United States Transportation Command

a. **US Army.** The US Army organizes, trains, and equips Army elements to accomplish discharge of Army pre-positioning ships and support JLOTS/logistics over-the-shore (LOTS) operations and waterway main supply route requirements as required by the JFC.

b. **US Navy.** The US Navy organizes, trains, and equips Navy elements to accomplish download of MPF and assault follow-on echelon (AFOE) vessels, execute offshore petroleum discharge system (OPDS) operations, and support JLOTS operations as required by the JFC.

c. **US Marine Corps.** The US Marine Corps organizes, trains, and equips US Marine Corps elements to support JLOTS operations as required by the JFC.

d. **US Air Force.** The US Air Force organizes, tracks, and equips US Air Force elements to support JLOTS operations as required by the JFC.

e. **Commander, US Transportation Command (CDRUSTRANSCOM).** CDRUSTRANSCOM is the Department of Defense (DOD) manager for the Defense Transportation System (DTS). CDRUSTRANSCOM provides the single port manager (SPM) for worldwide common-user sea ports, including those discharge sites requiring JLOTS operations. CDRUSTRANSCOM has additional responsibilities, as follows.

(1) In coordination with the Chairman of the Joint Chiefs of Staff (CJCS), maintains oversight responsibility for all DOD JLOTS-related programs including research and development, acquisition, training, and doctrine.

(2) Reviews JP 4-01.6, *Joint Logistics Over-the-Shore (JLOTS)*, as required and updates as appropriate.

(3) In coordination with the Services, tasks strategic sealift assets, i.e., sea barge, lighter aboard ship (LASH), OPDS, auxiliary crane ship (T-ACS), fast logistics ship, large medium speed roll-on/roll-off (RO/RO) ships, and fast sealift ships for participation in offshore single-Service or joint training annually.

(4) Maintains a highly trained pool of personnel from Military Sealift Command (MSC) that serve as liaison officers (LNOs) to the JLOTS commander during operations and JLOTS tests, exercises, and evaluations.

(5) Oversees SPM activities during JLOTS operations.

(6) Monitors the development and updating of the mission operations handbook for strategic sealift ships such as the T-ACS, sea barge (SEABEE), LASH, and OPDS.

(7) Oversees a no-notice activation program for RO/RO ships to ensure that the vessels can meet their full operational status categories of Maritime Administration (MARAD) Ready Reserve Force (RRF) as well as reduced operating status -4 or -5.

(8) Reviews approved Service program objective memorandums for JLOTS items.

(9) Provides JLOTS technical planning as required.

(10) Maintains oversight on other JLOTS matters not covered above.

5. Definition and Scope of Logistics Over-the-Shore Operations

a. LOTS operations is the process of loading and unloading of ships without the benefit of deep draft-capable, fixed port facilities; or as a means of moving forces closer to tactical assembly areas. While it is preferable to conduct JLOTS in a secure, non-threatening environment, current and future operations may require forces to conduct JLOTS in a nonsecure, asymmetrical environment.

b. Both the Navy and Army may conduct LOTS operations.

(1) In an amphibious or MPF operation, **the Navy may conduct LOTS operations in conjunction with a Marine Corps and/or Army landing force (LF)**. During an amphibious or MPF operation, the Navy is responsible for the discharge of cargo and supplies to the high water mark, where the LF assumes the responsibility for acceptance, transfer, and transportation to inland marshalling areas.

(2) **Army LOTS operations are generally conducted as part of base, garrison, or theater development, but may be conducted immediately after amphibious operations or as a separate evolution.** It may be supported and/or coordinated with other Services or allied and coalition

forces. During Army LOTS operations, supplies, equipment, and personnel are moved ashore and made available for onward movement to the organization responsible for theater movement control.

c. The scope of the LOTS operation will depend on geographic, tactical, and time considerations. **A LOTS operation area (LOA) is the geographic area required to conduct a LOTS operation.** Figure I-1 displays what a typical LOA may look like.

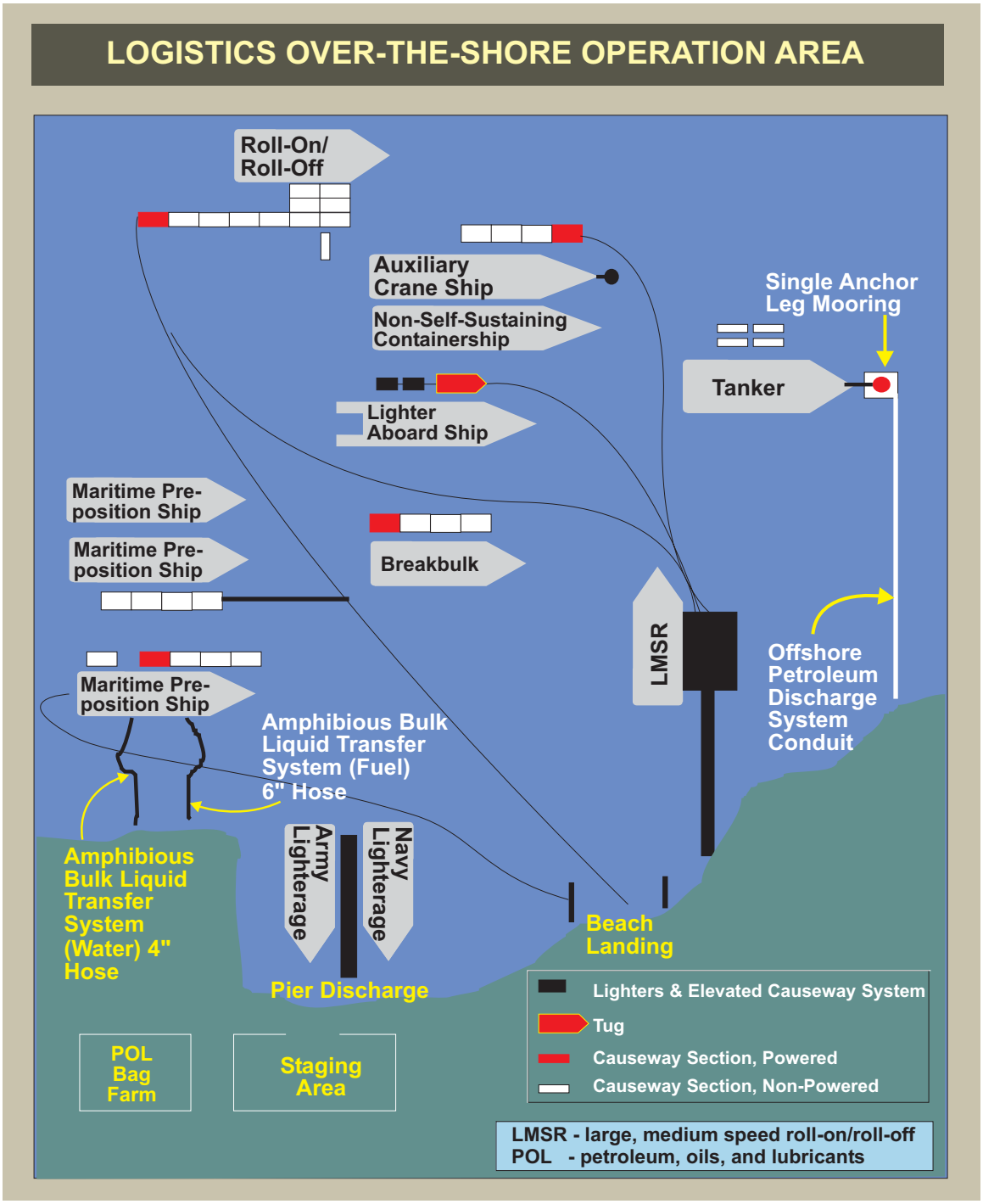


Figure I-1. Logistics Over-the-Shore Operation Area

6. Definition and Scope of Joint Logistics Over-the-Shore Operations

a. **JLOTS operations occur when Navy and Army LOTS forces conduct LOTS operations together under a JFC.** Traditionally Navy LOTS includes the use of Marine Corps forces. Generally, LOTS operations will be joint in all but a few exceptions.

b. The scope of JLOTS operations extends from acceptance of ships for offload through the arrival of equipment and cargo at inland staging and marshalling areas.

7. Definition and Scope of Multinational Joint Logistics Over-the-Shore Operations

Multinational JLOTS operations occur when US and coalition forces operate together under a multinational force commander. Other nation's watercraft assets are combined with US assets to perform LOTS operations.

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CHAPTER II
ORGANIZATION AND COMMAND

"Organization is the vehicle of force."

MGEN J.F.C. Fuller
***The Foundation of the Science of War*, 1926**

1. Overview

This chapter provides a broad overview of the execution of the JLOTS operation as well as the command and control (C2) of those task organizations formed to perform such operations. A description and discussion of an amphibious operation is provided initially to set the stage for the onset of a JLOTS operation that could follow. Additionally, this chapter describes the transition that occurs on termination of an amphibious operation where initial ship-to-shore control is vested with the Navy component and is ultimately passed to Army forces for LOTS operations. However, a JLOTS operation can be executed without an amphibious operation preceding it.

2. Command and Organization

Forces assigned to conduct the JLOTS operation are organized by the JFC, who is assigned in accordance with the guidance in JP 0-2, *Unified Action Armed Forces (UNAAF)*. **The JLOTS forces are normally organized along Service lines, but can also follow functional lines, with Service elements integrated under the tactical control (TACON) of the JLOTS commander.** Geographic combatant commanders have overall responsibility for JLOTS operations in their areas of responsibility (AORs). United States Transportation Command (USTRANSCOM) forces, when attached to the supported geographic combatant commander will normally also be under the TACON of the JLOTS commander. The composition of the JLOTS operational staff should contain appropriate representation of participating components. Each Service's senior officer or noncommissioned officer within the JLOTS organization should be afforded access to the JLOTS commander and, via the JLOTS commander, to the Service component commanders to address Service-related concerns or unique administrative requirements.

3. Responsibilities of the Combatant Commanders

Geographic combatant commanders have overall responsibility for JLOTS operations in their AORs. The geographic combatant commander may delegate authority to conduct JLOTS operations to subordinate JFCs in the conduct of their assigned missions. To accomplish this, the supported and supporting combatant commanders should have the following responsibilities.

a. Supported Combatant Commander

(1) Identifies potential requirements for JLOTS operations during the planning process and ensures force apportionment.

(2) Develops JLOTS concept of operations and initiating directive.

(3) Exercises combatant command (command authority) (COCOM) of assigned forces.

(4) Ensures security of JLOTS operations within the AOR.

(5) Allocates resources.

(6) Designates the JLOTS commander or the component to provide the JLOTS commander, unless authority to conduct JLOTS operations is delegated to a subordinate JFC.

(7) Performs intelligence threat assessment during the planning phase and develops indications and warnings intelligence during execution of JLOTS operations.

(8) Provides for reception, staging, onward movement, and integration of JLOTS equipment and material.

b. **Supporting Combatant Commanders**

(1) Provide input to supported combatant commander regarding concept of operations.

(2) Provide forces and resources to the supported combatant commander as directed.

4. Responsibilities of Service Component Commanders

Service component commanders normally support JLOTS operations by

a. Providing recommendations to the JFC on JLOTS operations.

b. Providing, equipping, and training active and reserve forces to meet required delivery timelines for the conduct of JLOTS operations.

c. Developing implementing plans for JLOTS operational contingencies.

d. When tasked by the JFC, designating JLOTS commander.

5. Service Component Tasks

Each Service component has personnel and equipment necessary for the conduct of LOTS operations. During the planning for and execution of JLOTS operations, each Service component will furnish such equipment and perform those tasks required by the operation plan (OPLAN) and operation order (OPORD) or as directed by the JFC during OPORD execution. Appendix M, "Unit Capabilities," reflects the Service elements required to conduct a number of logistic tasks.

a. **US Army.** The primary responsibilities of the US Army in LOTS and JLOTS operations are listed in Figure II-1.

b. **US Navy.** The primary responsibilities of US Navy forces in LOTS and JLOTS operations are listed in Figure II-2.

c. **US Marine Corps.** Depending on the size of the force and duration of the operation, Marine Corps forces require LOTS support to sustain operations ashore. In such a situation, the Marine Corps can augment LOTS operations with shore-based tactical motor transport, materials handling, bulk

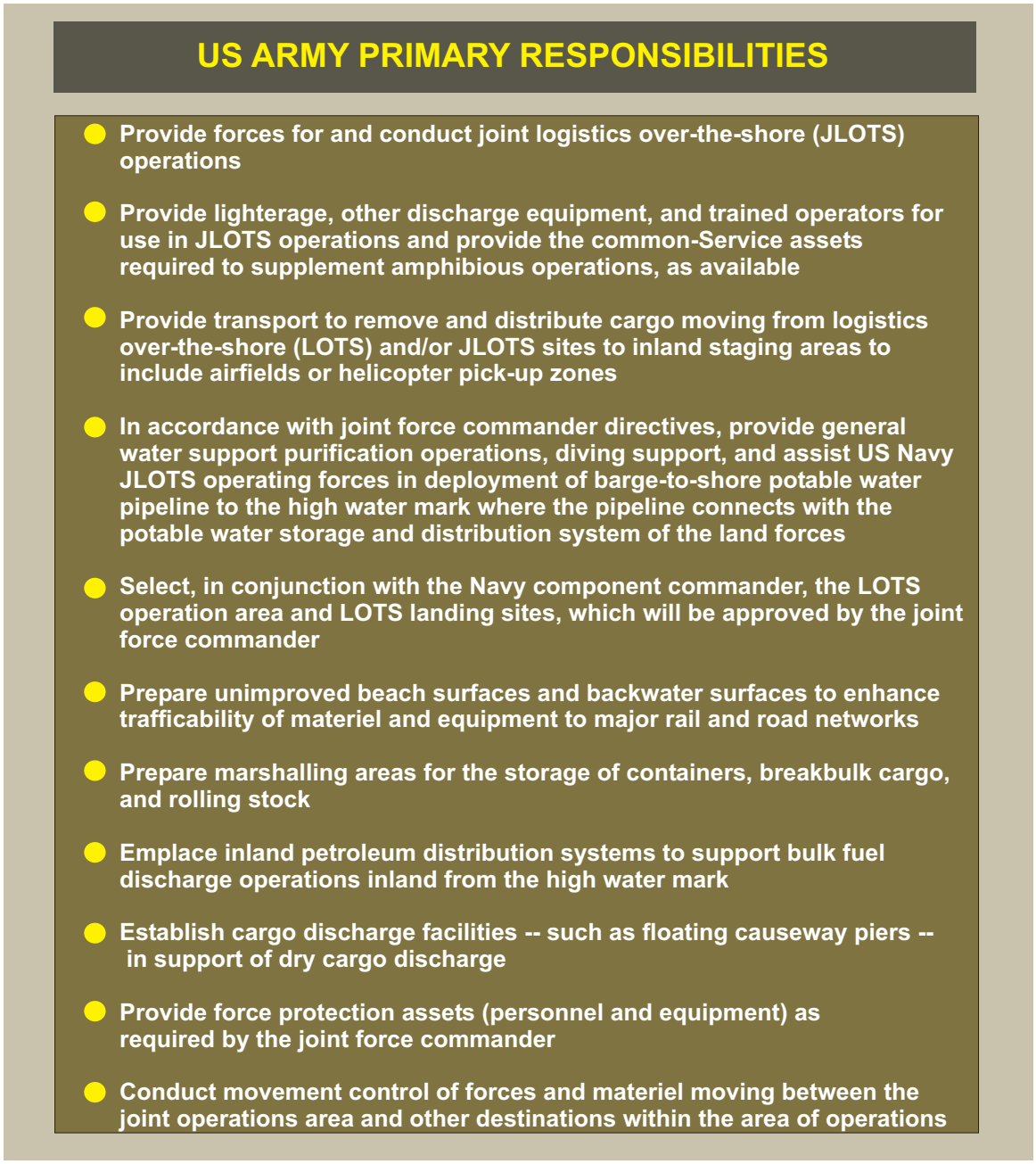


Figure II-1. US Army Primary Responsibilities

US NAVY PRIMARY RESPONSIBILITIES

- Provide, as required by the joint force commander (JFC), appropriate naval forces and equipment
- Exercise command of Navy ships and boats to ensure safe and proper operation and to take action against the adversary, if necessary
- Exercise a minimum of tactical control over the disposition and operation of other participating ships as necessary to protect them
- Provide for offshore petroleum discharge to the high water mark
- Provide lighterage, other discharge equipment, and trained operators for use in joint logistics over-the-shore (JLOTS) operations
- Provide common-Service assets, as required
- Provide potable water as directed by the JFC
- Select, in conjunction with a land commander, the logistics over-the-shore (LOTS) operation area and LOTS landing sites
- Erect cargo discharge facilities, such as the elevated causeway system, and floating causeway piers in support of dry cargo discharge operations
- Conduct beach party operations, including control and salvage of lighterage and control of the beach transit of disembarked vehicles and cargo
- Provide mobile inshore undersea warfare units for seaward surveillance in support of JLOTS security
- Construct expeditionary facilities to support beach operations and enhance throughput, provide camp support, and security
- Conduct preliminary hydrographic survey and engineering reconnaissance of potential JLOTS locations

Figure II-2. US Navy Primary Responsibilities

liquid, and C2 assets to handle its primary responsibilities as identified in Figure II-3. These responsibilities are valid in supporting LOTS only until the Marine air-ground task force (MAGTF) commander requires combat service support (CSS) element units for follow-on Marine Corps missions. The Marine Corps may leave a Marine logistics command to coordinate the Marine Corps logistics effort and provide a liaison for the LOTS staff.

d. **US Coast Guard.** The Coast Guard is organized, trained, and equipped to provide port safety and security in a LOTS or JLOTS environment. Detailed guidance regarding harbor and port security is covered in Commandant Instruction M16000.12, *Marine Safety Manual, Volume 7, Port Security*. If requested, the Coast Guard may provide a port security unit (PSU) or units

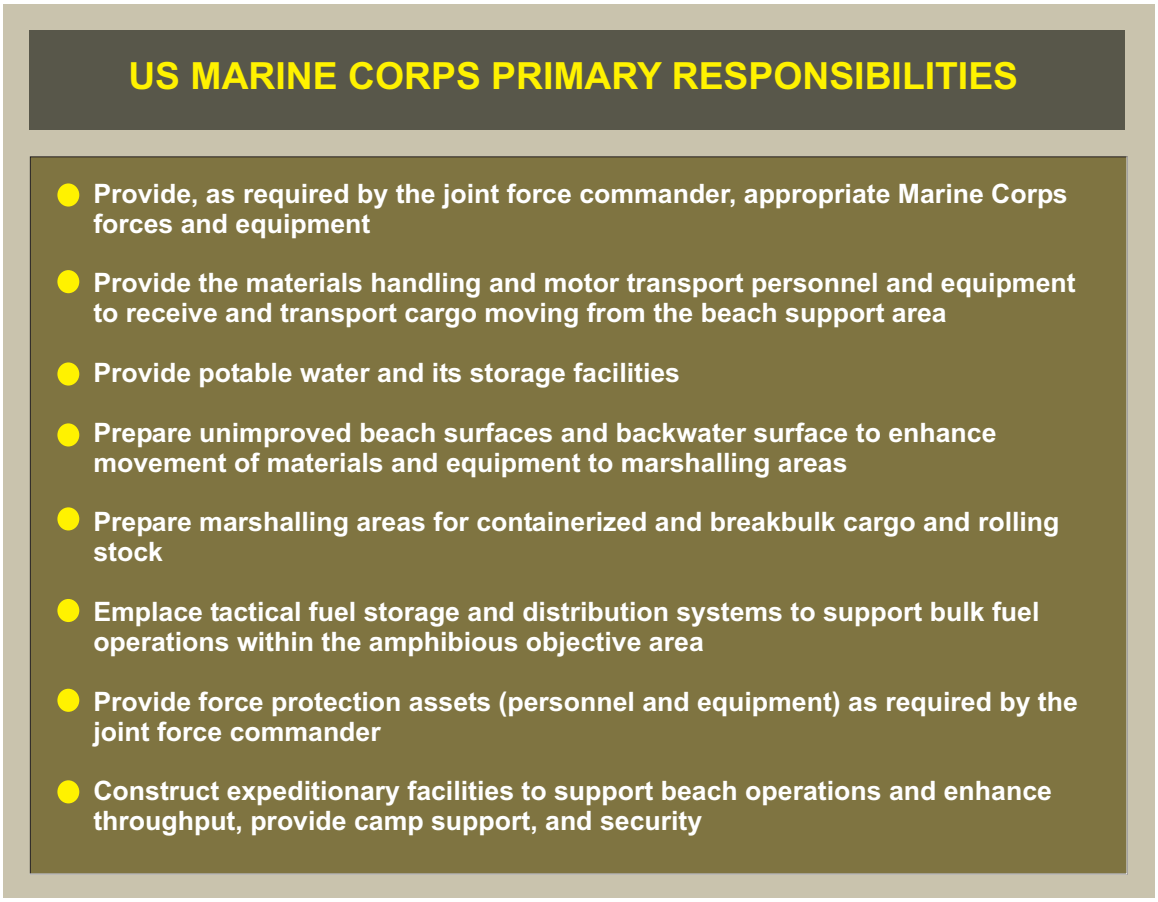


Figure II-3. US Marine Corps Primary Responsibilities

or individual components thereof, maritime safety and security team or teams, and high endurance cutters or patrol boats. Coast Guard units and elements detailed, depending on specialty, will assist the JLOTS commanders by performing port security and port safety operations to help ensure the security of vessels, port facilities, and cargo. Cargo handling specialists may also be provided to monitor the safety of cargo handling operations, especially military explosives and hazardous munitions, during outload and offload operations. Coast Guard forces are available to support combatant commanders for missions identified in the 1995 Secretary of Department of Transportation and Secretary of Defense (SecDef) memorandum of agreement (MOA). Coast Guard LOTS and JLOTS support assets should be included in a combatant commander's deliberate planning process. Coast Guard elements will require space for refueling of patrol craft and billeting space, if not deployed ashore, and normal logistic support. Coast Guard forces work in conjunction with mobile inshore undersea warfare (MIUW) units to provide surveillance and interdiction in the seaward operational area. See NWP 3-10, *Naval Coastal Warfare*. Note that Coast Guard units and details are not self-sufficient and must be supported by the receiving commander, particularly when deployed outside the continental United States.

e. **US Air Force.** Air Force support to JLOTS operations includes airlift and air defense operations and other support, as directed by the JFC. In addition, Air Force weather (AFW) personnel assigned in support of Army component forces participating in LOTS and JLOTS may be tasked to provide

support of operations. Participation may include designation as lead source of meteorological and oceanographic (METOC) support to JLOTS commander in conjunction with Navy mobile environmental team (MET) personnel. AFW personnel will have capability to conduct both weather and surf forecasting and observations, as required.

6. Responsibilities of the Joint Logistics Over-the-Shore Commander

The JLOTS commander is responsible for detailed planning and execution of JLOTS operations. This will be accomplished through a central planning team composed of representatives from participating Service and USTRANSCOM components. Either the Army or the Navy will provide the JLOTS commander. Principal responsibilities of the JLOTS commander include

a. Publishing an OPORD or directive that states responsibilities and describes procedures for the conduct of the JLOTS operation.

b. In conjunction with the combatant commander, selecting the LOA.

c. Conducting JLOTS execution, beginning with acceptance of ships for offload, through the arrival of equipment and cargo at inland staging and marshalling areas.

d. Coordinating over-the-shore liquid cargo operations. For OPDS, responsibility includes acceptance of OPDS vessels and the installation and operation of OPDS to its termination point on the beach, where it interfaces with the inland petroleum distribution systems (IPDSs) and the amphibious assault fuel system (AAFS).

7. Common-User Sealift

COCOM of common-user sealift in support of a JLOTS operation remains with CDRUSTRANSCOM unless the common-user sealift is transferred to the commander of another unified command as directed by the SecDef. Operational control (OPCON) is usually delegated to the Commander, Military Sealift Command (COMSC) or the designated subordinate. TACON is usually assigned to the supported combatant commander and delegated to the on-scene naval officer in tactical command (OTC).

a. **The naval OTC** will act as the sole contact with strategic sealift shipping at the JLOTS site for tactical matters and will issue sailing orders to ships in coordination with the JLOTS commander and the MSC area commander's representative. **The JLOTS commander is subordinate and responds to the naval OTC in tactical matters affecting strategic shipping involved in the JLOTS operation.** In addition to normal duties, the **MSC area representative** serves as a special staff adviser to the JLOTS commander and is the JLOTS commander's point of contact for operational matters dealing with strategic shipping in the LOA. The MSC representative is normally located aboard ship. If the MSC representative has the personnel available, one of the MSC representatives should be located with the JLOTS commander. Rapid

communication and coordination between the JLOTS commander and MSC representative are essential for efficient operations.

b. Specific discussion relative to authority and responsibilities of the ship master and coordination with embarked military units is detailed in Appendix K, "Command, Organization, and Working Relationships with Civilian Merchant Mariners."

8. Command and Control Relationships

C2 relationships are as prescribed by JP 0-2, *Unified Action Armed Forces (UNAAF)*. The following conditions apply.

a. In an amphibious operation, command and inter-Service relationships will be guided by JP 3-02, *Joint Doctrine for Amphibious Operations*.

b. **In JLOTS operations, Service elements must be integrated under one JLOTS commander who normally has TACON authority to direct JLOTS operations.** Service elements should be employed in a manner consistent with their training, unit, and job description. The senior member of each Service should be afforded access to the JLOTS commander. Senior Service members should also be afforded access (via the JLOTS commander) to their Service component commanders for Service-related issues. Responsibilities and details for all aspects of the JLOTS operation are provided in an OPORD or other appropriate document prepared by the JLOTS commander.

c. Specific JLOTS operations will be identified by the JFC during concept development. At that time, tentative JLOTS sites will be selected and force requirements identified. **Landing sites will be selected by agreement between the supporting Navy component commander and the JLOTS commander and will be approved by the JFC.** The JLOTS commander is responsible for consideration of the inland access requirements.

d. The JLOTS commander will coordinate the positioning of ships for JLOTS operations at the selected landing sites with the supporting Navy component commander, in accordance with priorities established by the JFC.

e. MPF and afloat pre-positioning force (APF) operations can be used to augment or reinforce amphibious forces. MPF and APF, equipment, and supplies may arrive to support the commander, landing force (CLF) prior to arrival of AFOE and follow-up ships. **When JLOTS operations follow amphibious ship-to-shore operations, this will entail transitioning all or part of the amphibious objective area (AOA) or area of operations into a LOA and passing control of this area, together with designated forces, from the designated amphibious force (AF) commander(s) to the JLOTS commander.** This transition will be accomplished as directed by the JFC or in accordance with the JFC's initiating directive or OPORD. Offload assets that are at the site of an amphibious operation would normally be retained by the on-scene Navy component commander at the termination of the amphibious operations. Any exception to this procedure must be approved by the JFC. If the OPORD or JFC directs that amphibious task

force (ATF) offload assets be diverted to subsequent LOTS and JLOTS operations as the offload transitions to Army LOTS, those assets should be recovered at the earliest practical moment.

f. During ship-to-shore operations, control is as follows.

(1) During an amphibious operation, the commander, amphibious task force (CATF) is responsible for overall control of both surface and air ship-to-shore movement. The CATF exercises this control through the Navy support element (See subparagraph 10a and Figure II-5).

(2) Normally, during transition from amphibious ship-to-shore operations to JLOTS operations there is a period in which the Navy and supported Marine Corps or Army forces continue to conduct ship-to-shore movement using the basic control organization and procedures used for the amphibious operation. As Army transportation units arrive in the area, they report to their Service component but functionally integrate into the existing Navy and Marine Corps or Army cargo discharge organization. **The JLOTS ship-to-shore C2 organization, when operationally ready and directed by the JFC, will assume responsibility for the JLOTS operation.** Control of all ship-to-shore assets is transferred from the Navy component commander to the JLOTS organization. Navy ship-to-shore assets not already withdrawn will remain under the TACON of the JLOTS commander. See subparagraph 10e and Figure II-9.

9. Amphibious Operations

a. **Background.** An amphibious operation is an operation launched from the sea by an AF, embarked in ships or craft with the primary purpose of introducing a LF ashore to accomplish the assigned mission. **Forces assigned to conduct an amphibious operation are organized as an AF. An AF is an ATF and an LF, together with other forces that are trained, organized, and equipped for amphibious operations.** An ATF is a Navy task organization formed to conduct amphibious operations. An LF is a Marine Corps or Army task organization formed to conduct amphibious operations. A condensed discussion is presented here to set the stage of transition into JLOTS.

(1) Amphibious operations may be conducted for the purposes listed in Figure II-4.

(2) Amphibious operations are normally part of a joint operation and may require extensive air, maritime, land, space, and special operations forces participation. Amphibious operations can take place across the range of military operations to support the JFC's campaign plan and can generally be broken down into five major types: assaults, withdrawals, demonstrations, raids, and other amphibious operations. **Amphibious operations generally follow distinct phases, though the sequence may vary.** These phases include planning, embarkation of LFs and equipment, rehearsal, movement to the AOA, and action. The action phase in an assault requires the landing of forces with accompanying supplies and equipment to accomplish a rapid buildup of combat power from sea to shore. The action phase also requires supporting the LF until accomplishment of the AF mission and termination of the amphibious operation. Movement of the LF to or from the objective area is predominantly made by Navy surface ships, but also may include movement by airlift organic to participating commands, Air



Figure II-4. Applications of Amphibious Operations

Mobility Command (AMC) airlift, theater airlift, MSC sealift, or commercial ships. All ships assigned to the ATF are called assault shipping. Movement between assault shipping (including both Navy and commercial ships assigned to the ATF) and the hostile shore is made by landing craft, amphibious vehicles, rotory wings aircraft and vertical takeoff and landing aircraft. **The operation focuses on ship-to-shore movement of the LF from the assault shipping to designated landing areas in accordance with the tactical requirements of the CLF.** Administrative unloading of personnel and materiel from ships may be conducted after security has been assured through seizure and control of adequate land areas and adjacent sea areas to ensure unimpeded discharge of personnel and cargo.

(3) **The AF is task-organized based on the mission. The AF always includes Navy forces and a LF, and may include MSC-provided ships and other designated forces.** The command relationships established among the CATF, CLF, and other designated commanders of the AF are chosen by the common superior commander (or establishing authority) and should be based on mission, nature and duration of the operation, force capabilities, C2 capabilities, battlespace assigned, and recommendations from the subordinate commanders. Typically, a support relationship is established between the commanders and is based on the complementary rather than similar nature of the ATF and LF. However, it is not the intent to limit the common superior's authority to establish either an OPCON or TACON command relationship as appropriate. The CATF plans and executes the deployment of forces by all transportation modes and the landing of all forces and supplies in accordance with the requirements of the CLF. For movement, the AF may be organized into an advance force (pre-D-day) and a main body (D-day and post-D-day). **The LF is divided into two echelons — the assault echelon (AE) and the AFOE.**

b. **Assault Echelon.** The AE consists of the assault troops, vehicles, aircraft, equipment, and supplies required to initiate the assault landing. Also, it may include landing forces staged by any mode to advance support bases near the objective area before the assault. Pre-staged forces at advanced support bases provide initial combat capability in addition to those forces embarked in Navy amphibious ships.

c. **Assault Follow-on Echelon.** The AFOE consists of the assault troops, vehicles, aircraft, equipment, and supplies that, though not needed to initiate the assault, are required to support and sustain the assault. To accomplish its purpose, the AFOE is normally required in the objective area no later than 5 days after commencement of the assault landing.

d. **AE and AFOE Considerations.** Considerations pertaining to the AE and AFOE include the following.

(1) **Loading and unloading of the AE and AFOE are the responsibility of the CATF.** Units and unit equipment are marshalled at their home stations and staged at ports of embarkation in accordance with their time-phased deployment schedules. **Ships are combat-loaded** to facilitate expected requirements of the concept of operations ashore and the supporting landing plan. Ship unloading is accomplished by the combined effort of naval, LF, and supporting agency personnel involved in the amphibious operation. Ship-to-shore movement is controlled by the Navy control group, the tactical air control group, the tactical logistics group, and the landing force support party (LFSP). See NWP 3-02.1, *Ship-to-Shore Movement*, for further information. The CATF exercises overall control of the ship-to-shore movement. The CATF is responsible for debarkation and offload until termination of the amphibious operation, when the responsibilities for debarkation or offload are passed to another offload organization designated by higher authority. (The amphibious operation would not normally be terminated until the AFOE is ashore.) The CLF informs the CATF of the requirements for units, materiel, and supplies, and specifies the time at which they will be required. **The CLF is responsible for the movement of cargo within the beach support area and into inland CSS areas.** Since most MSC-provided ships have neither the organic offload capabilities nor the organic ability to control debarkation of embarked troops or cargo, their offload is conducted by the ATF with naval or landing force personnel and equipment.

See JP 3-02, Joint Tactics, Techniques, and Procedures for Amphibious Embarkation and Debarkation.

(2) **Shipping used to resupply the ATF or to transport additional units, supplies, and equipment required for the buildup of the beachhead is called follow-on shipping.** Essentially, follow-on shipping delivers reinforcements and stores after the AE and AFOE have been landed. This shipping is provided by the combatant commander and is echeloned into the AOA as required by the CATF. The CATF provides protection for and controls both assault and follow-on shipping within the AOA. The CATF orders shipping forward, as necessary, to fulfill the needs of the LF for units, materiel, and supplies. Upon unloading, empty follow-on shipping assets are normally returned to the common user fleet where MSC assumes employment

responsibility. Additionally, the MSC commander, under the numbered fleet commander, assumes responsibility for coordinating protection of shipping. Upon disestablishment of the AOA, control of follow-on shipping passes from the CATF to the Navy OTC or JLOTS commander, as appropriate.

10. Joint Logistics Over-the-Shore Operations Following Amphibious Operations

Command relationships for **ship-to-shore operations** change depending on the particular situation in which LOTS or JLOTS operations are conducted. These changes can be reflected in the following five notional phases.

a. **Phase 1A — MPF ordered to conduct a LOTS operation in support of an amphibious assault or MPF in-stream offload.** The CATF or the commander, maritime pre-positioned force (CMPF), will exercise C2 over the Navy LOTS operation. In the arrival and assembly phase, the MPF is task-organized into three elements: maritime pre-positioning ships squadron (MPSRON), MAGTF, and the Navy support element (NSE). An MPF operation may consist of a single maritime pre-positioning ship interacting with a forward-deployed Marine expeditionary unit; an MPSRON and a Marine expeditionary brigade (MEB) fly-in echelon; or a Marine expeditionary force (MEF) falling in on all three MPSRONs. The commander, MPSRON will position the ships and ensure readiness of the ships' equipment for offload. The MAGTF commander exercises C2 over Marine Corps units and is responsible for the arrival and assembly operations. The MAGTF commander will task-organize an arrival and assembly operations group (AAOG) and its subordinate elements (arrival and assembly operations element and the LFSP) to coordinate and control the arrival and assembly operations and create a temporary task organization, the offload preparation party (OPP). The AAOG commands and controls activities within the assembly area until arrival of the MAGTF commander, and provides initial security and oversees the preparation for combat. The LFSP and its task-organized elements (port operations group, beach operations group, arrival airfield control group [AACG], and the movement control center) control the throughput of personnel and cargo at the air/seaports or beach. The OPP is responsible for preparing the ships' cargo handling systems, lighterage, fuel/water discharge systems, and initial de-preservation and preparation of the maritime pre-positioning ships (MPS). The commander, naval beach group (NBG) is designated the NSE commander and will exercise C2 over Navy units performing the LOTS cargo transfer functions during the ship-to-shore movement. The offload control unit, under the direction of the offload control officer (OCO), coordinates with the AAOG for offload matters. The ship's debarkation officer (SDO) from the Navy cargo handling and port group (NAVCHAPGRU) or amphibious construction battalion (PHIBCB), the assault craft unit (ACU), lighterage element, and the beach party team report to the OCO for in-stream offload operations. The SDO will coordinate the efforts of the Navy cargo handling detachment, the Marine Corps debarkation teams, and the employment of lighterage. Phase 1A command relationships are shown in Figure II-5.

b. **Phase 1B — Afloat pre-positioning ships (APS) have been ordered to conduct an in-stream discharge.** MSC will direct movement of the APS. The APS will be under the OPCON of a fleet commander/Navy component commander during transit to the area of operation. Upon arrival, the senior Army Service component commander (ASCC) will assume OPCON for APS operations until

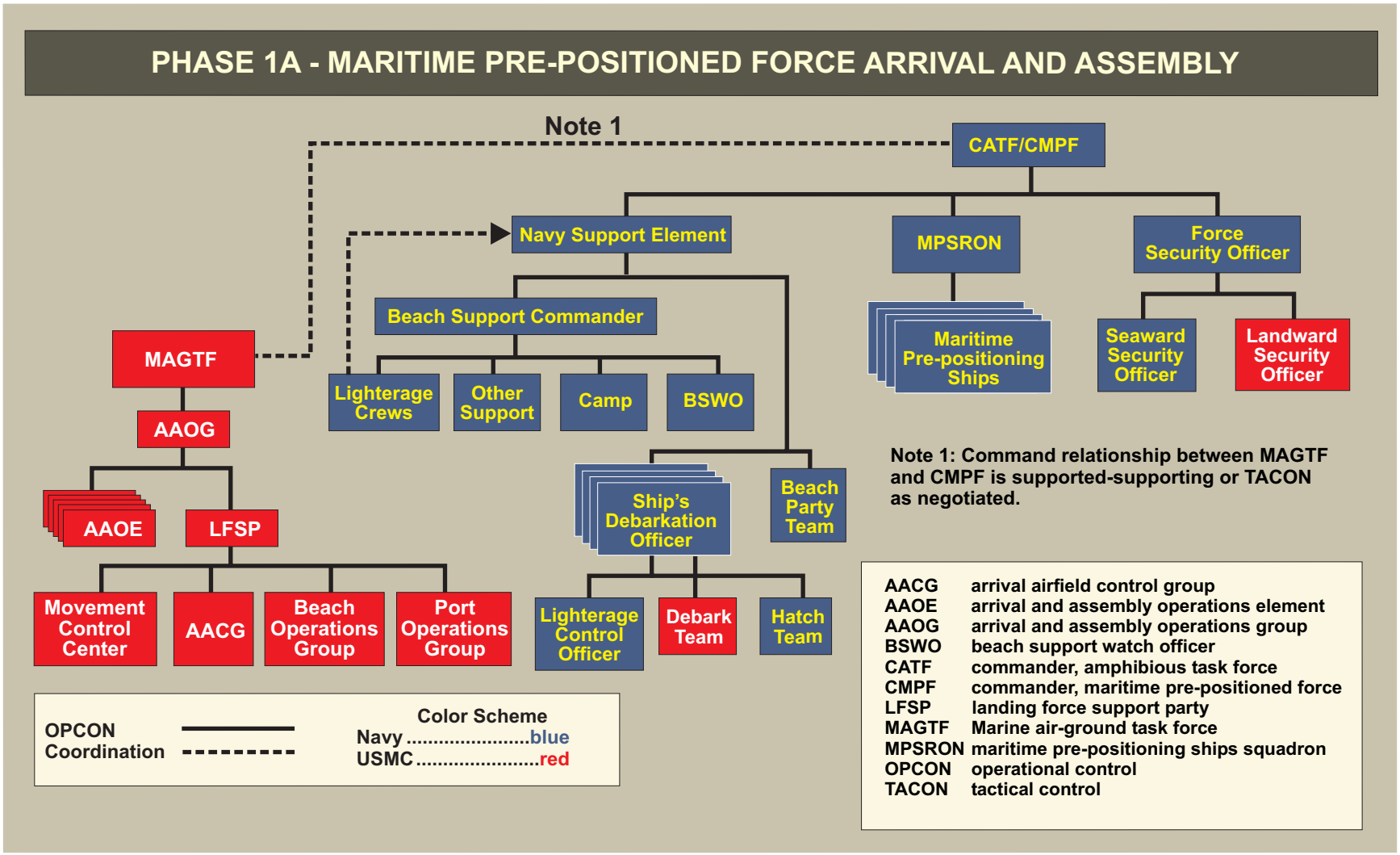


Figure II-5. Phase 1A — Maritime Pre-positioned Force Arrival and Assembly

directed otherwise. The Army transportation group (composite) will assume responsibility for the discharge of APS, including bulk cargo, wheeled and tracked vehicles, and Army lighterage. The Army transportation group (composite) commander also will assume C2 of all port functions to ensure force reception and staging during LOTS operations. A lighterage control center (LCC) will be established within the harbormaster operations detachment (HMOD). The HMOD will provide traffic management, port control, and harbor services on a 24-hour basis. The LCC will assign lighterage to the ship lighterage control point (SLCP) and/or beach lighterage control point (BLCP). A port support activity (PSA), under the OPCON of the Army transportation group (composite), will be organized to assist in the receipt, processing, and clearance of cargo at the port. The ASCC and Army Materiel Command will coordinate with MSC concerning authorization for the OPP to embark the APS. The OPP (elements from Surface Deployment and Distribution Command [SDDC], and the US Army Medical Material Agency) are OPCON to Army Materiel Command during the offload preparation mission. The Army transportation group (composite) will send an advance party to prepare the APS for cargo offload to include discharging of lighterage and the modular causeway system (MCS) assets in-stream. As the Army transportation group (composite) subordinate units arrive, they begin LOTS operations. The engineer company prepares the beach; the cargo transfer company begins cargo offload and receives cargo on the beach; and the causeway company prepares and begins MCS operations as well as beach prep and erection of the causeway pier (CWP). Additionally, the heavy and medium boat companies, the floating craft company, and the HMOD begin lighterage operations in support of the offload. As Navy and Marine Corps units, their OPP, and MPF ships arrive, they begin preparation for ship discharge and integration of their LOTS personnel and equipment into the LFSP of the existing amphibious assault operation. Phase 1B command relationships are shown in Figure II-6.

c. **Phase 2 — Navy and Army are ordered to prepare to conduct JLOTS operations.** Navy and Marine Corps elements and lighterage continue the MPS offload. Elements from USTRANSCOM (SDDC tiger team and MSC officers), the Army transportation group (composite), and the APS initiate deployment into the area. The SDDC tiger team will serve as a special staff advisor to the JLOTS commander for port management operations. The MSC LNO will serve as a special staff advisor to the JLOTS commander for operational matters affecting commercial shipping in the JLOTS operational area. Common-user sealift assets will remain under COCOM of USTRANSCOM, OPCON to MSC, and TACON to the CATF/CMPF. As Army units arrive, they will be under the administrative control of the ASCC or Corps Support Group. The CATF/CMPF will exercise TACON over the units as they integrate into the existing Navy and Marine Corps LOTS structure. As the Navy, Marine Corps, and Army units begin preparation for mission execution, this discharge becomes a JLOTS operation. The Army transportation group (composite) advance party will report to the CATF/CMPF, begin preparations for receiving/discharging the APS, and ensure full integration of its subordinate elements (security, terminal battalion (composite), lighterage, AACG, and the IPDS advance party) into the ongoing LOTS operation. The Army transportation group (composite) commander will also begin coordination with the MPF MAGTF commander on turnover of staging/marshalling areas, tactical assembly areas and security boundaries. The OPDS will arrive under the OPCON of the MPSRON commander. The NSE commander will assume TACON of the OPDS for pumping operations. Phase 2 command relationships are shown in Figure II-7.

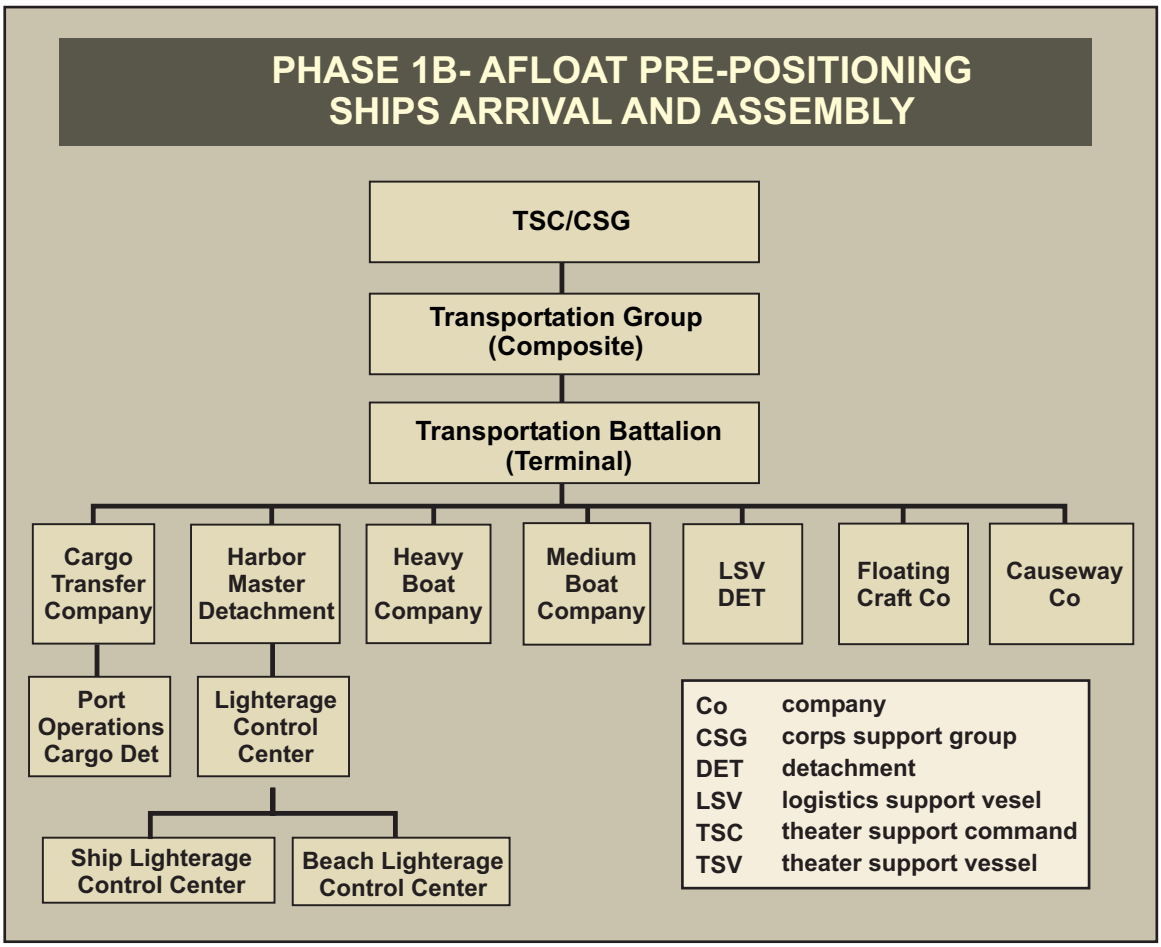


Figure II-6. Phase 1B — Afloat Pre-positioning Ships Arrival and Assembly

d. **Phase 3 — JLOTS Preparation.** If the Navy/Marine Corps forces arrived and established operations first, the JFC may appoint the CMPF as the initial JLOTS commander. Navy and Marine Corps elements and lighterage continue the MPS offload utilizing LOTS assets and Navy/Army lighterage. The SDDC tiger team and MSC LNO continue their port and commercial shipping coordination support to the JLOTS commander. The remaining elements of the Army transportation group (composite) and APS arrive in the LOA. The Army transportation battalion (terminal) will provide a beach clearance unit (BCU), Army lighterage, AACG, and the SDO/debarkation teams to effect APS offload operations. The JLOTS commander will establish a joint lighterage control center (JLCC), composed of Army and Navy personnel. The JLCC exercises TACON over the lighterage until released back to the lighterage unit commanders. Further, it will coordinate the management and modification of lighterage usage plans based on requests by the SDO and SLCP who keeps track and controls the movement of assigned lighterage. Additionally, the battalion will exercise TACON over the PSA. Following an amphibious operation, the JLOTS commander will be from the Navy and then may transition to the Army once the AFOE shipping has been successfully discharged. It is important to note that it may take up to 30 days after the assault phase for the AFOE shipping to be downloaded due to weather and elevated causeway system (modular) (ELCAS (M)) time emplacement constraints (15-20 days). Additionally, several of the AFOE vessels are "breakbulk" ammunition ships, which take longer to download than container or RO/RO vessels. Because of the possible long lead-time to download the

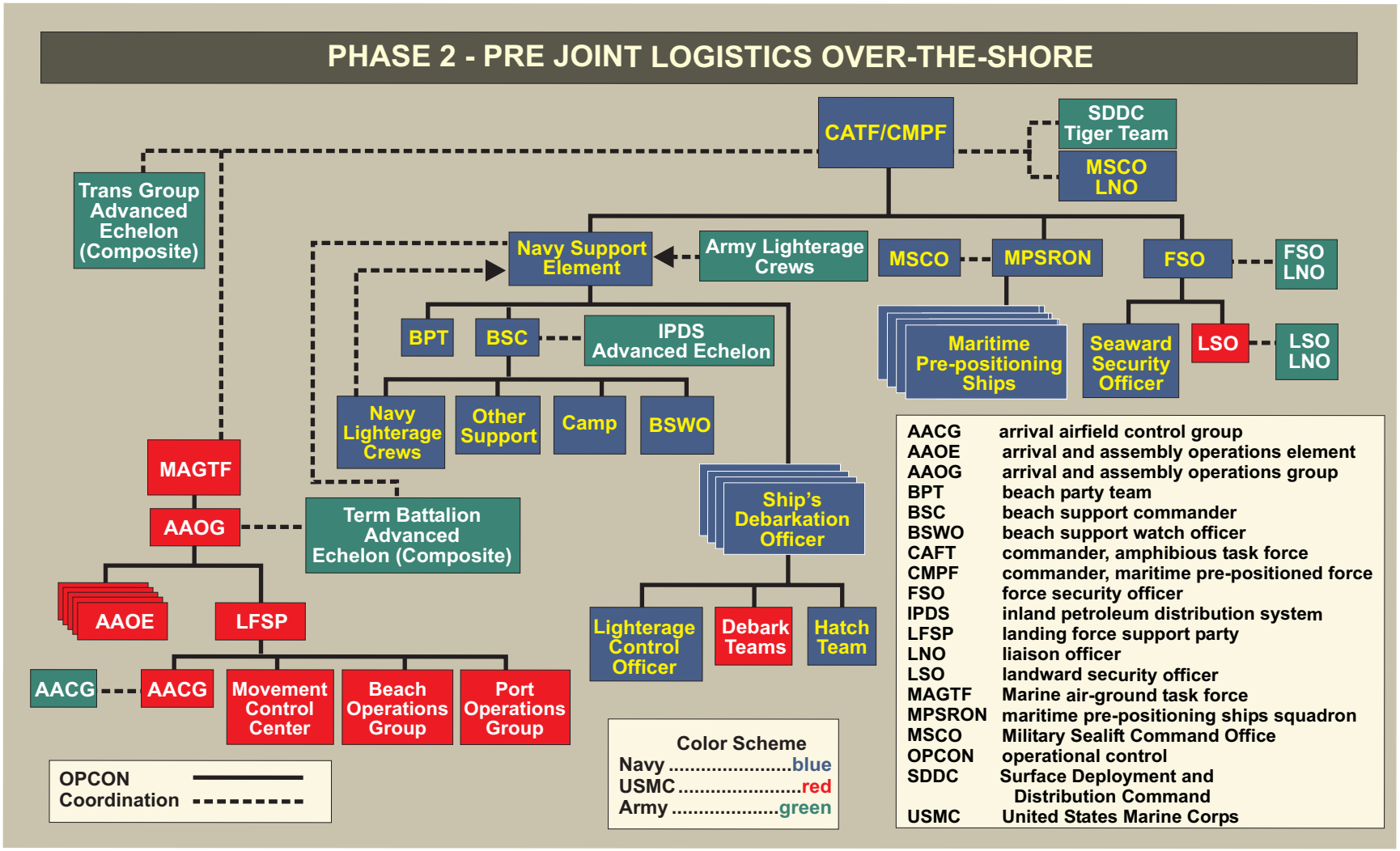
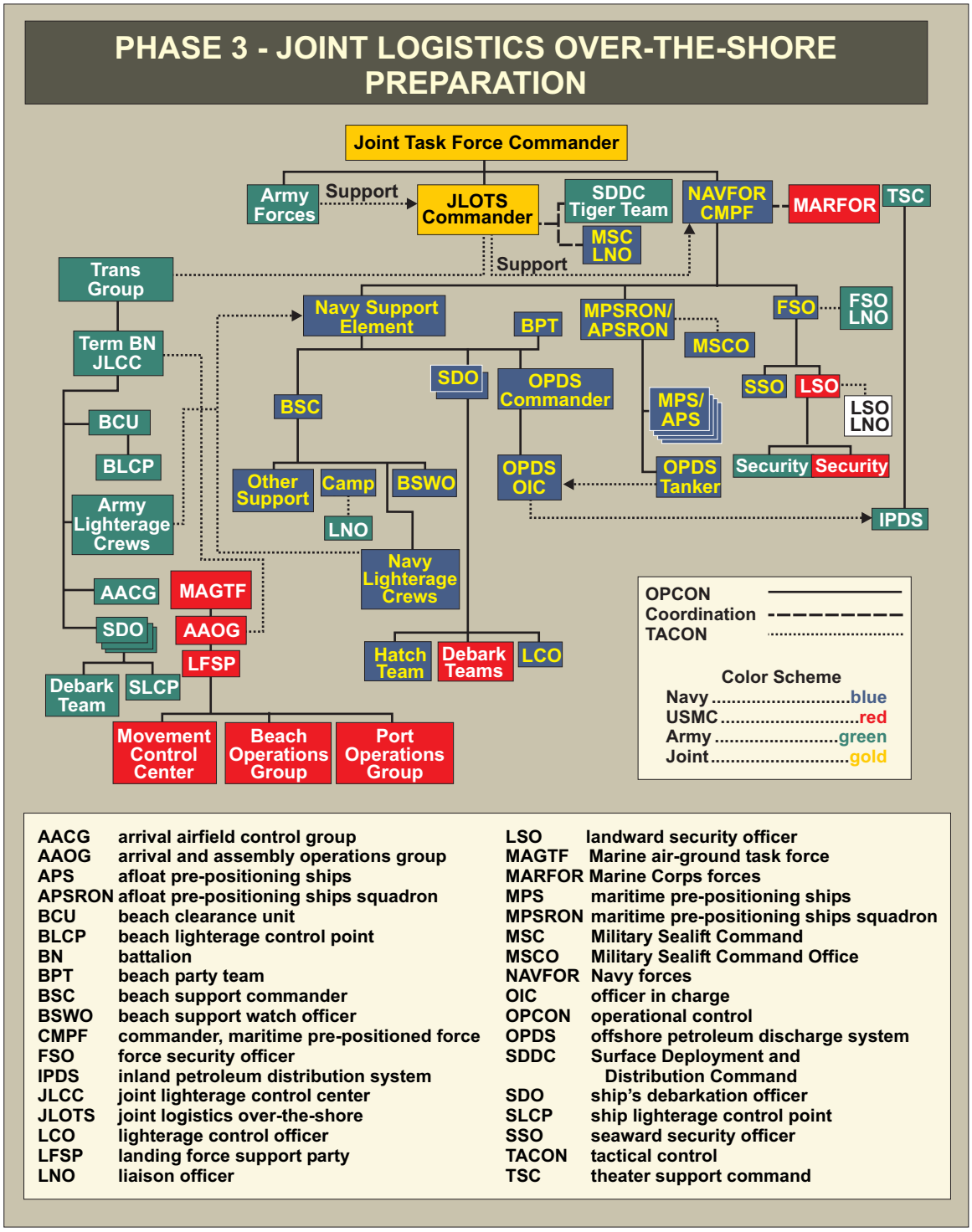


Figure II-7. Phase 2 — Pre Joint Logistics Over-the-Shore

AFOE shipping, the operation may actually transition from a Navy-led JLOTS to an Army-led "fixed-port" operation if a nearby port facility has been secured and is opened for vessel traffic. Phase 3 command relationships are shown in Figure II-8.

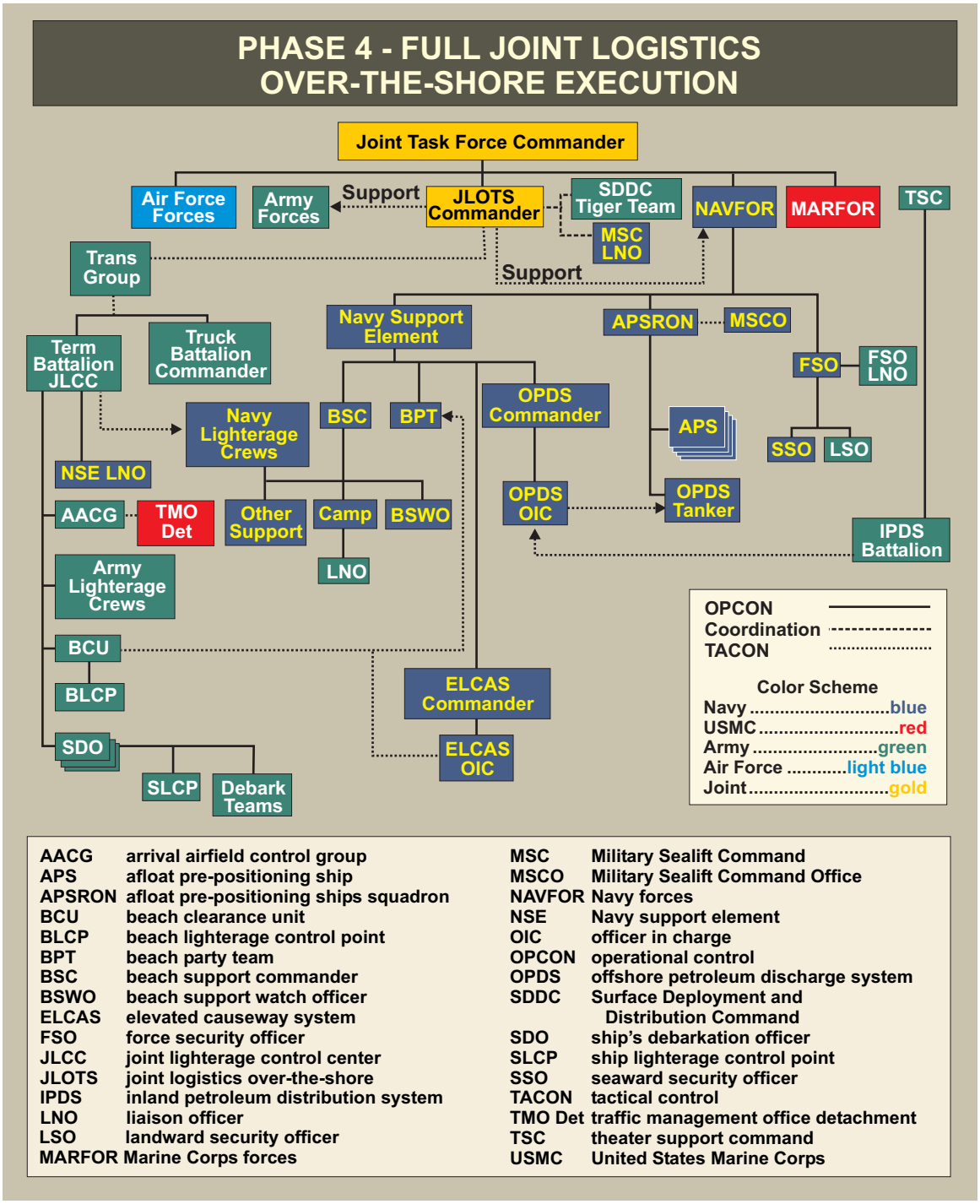
e. **Phase 4 — Full JLOTS Execution.** The combatant commander or the subordinate JFC will normally designate a JLOTS commander and deputy. Responsibility for the offload site(s) and TACON of certain logistic support capabilities previously coordinated will pass from the CATF to the JLOTS commander after termination of the amphibious operation and at the start of the JLOTS operations. Personnel and equipment remain under TACON of the JLOTS commander until released by the JFC. Once released by the JFC, the Navy and Marine Corps forces will be reassigned as planned or needed to support LF operations and/or other operations, as determined by the JFC, and the MPF/APS will become USTRANSCOM strategic lift assets. Navy and Army cargo handling personnel and/or civilian mariners (in case of the T-ACS) will prepare for the discharge of arriving strategic sealift ship cargo. Army and Navy lighterage, under the TACON of the SDO and JLCC, continue delivery of equipment and sustainment cargo ashore. Upon arrival and emplacement of the elevated causeway system (ELCAS), the Navy will retain OPCON of the system but will transfer TACON to the BCU for mission operations. Phase 4 command relationships are shown in Figure II-9.

f. **Phase 5 — JLOTS Sustainment.** Navy and Army LOTS personnel and equipment continue the movement of sustainment cargo from ship to shore. Ultimately, the JLOTS operations may transition to Army LOTS thereby transferring the naval elements from the JLOTS commander to the Navy component commander. Phase 5 command relationships are shown in Figure II-10.



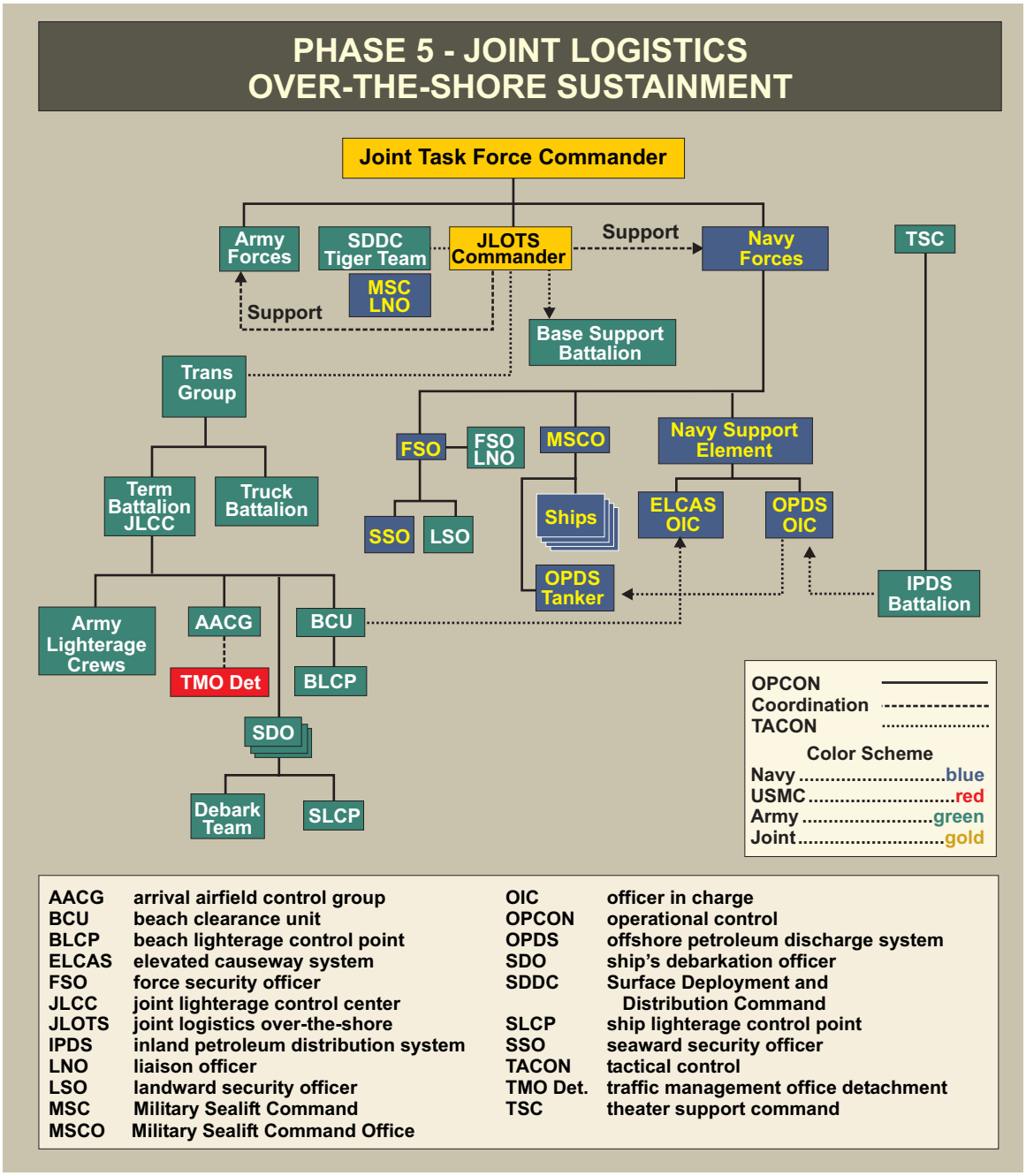
AACG	arrival airfield control group	LSO	landward security officer
AAOG	arrival and assembly operations group	MAGTF	Marine air-ground task force
APS	afloat pre-positioning ships	MARFOR	Marine Corps forces
APSRON	afloat pre-positioning ships squadron	MPS	maritime pre-positioning ships
BCU	beach clearance unit	MPSRON	maritime pre-positioning ships squadron
BLCP	beach lighterage control point	MSC	Military Sealift Command
BN	battalion	MSCO	Military Sealift Command Office
BPT	beach party team	NAVFOR	Navy forces
BSC	beach support commander	OIC	officer in charge
BSWO	beach support watch officer	OPCON	operational control
CMPF	commander, maritime pre-positioned force	OPDS	offshore petroleum discharge system
FSO	force security officer	SDDC	Surface Deployment and Distribution Command
IPDS	inland petroleum distribution system	SDO	ship's debarkation officer
JLCC	joint lighterage control center	SLCP	ship lighterage control point
JLOTS	joint logistics over-the-shore	SSO	seaward security officer
LCO	lighterage control officer	TACON	tactical control
LFSP	landing force support party	TSC	theater support command
LNO	liaison officer		

Figure II-8. Phase 3 — Joint Logistics Over-the-Shore Preparation



AACG	arrival airfield control group	MSC	Military Sealift Command
APS	afloat pre-positioning ship	MSCO	Military Sealift Command Office
APSRON	afloat pre-positioning ships squadron	NAVFOR	Navy forces
BCU	beach clearance unit	NSE	Navy support element
BLCP	beach lighterage control point	OIC	officer in charge
BPT	beach party team	OPCON	operational control
BSC	beach support commander	OPDS	offshore petroleum discharge system
BSWO	beach support watch officer	SDDC	Surface Deployment and Distribution Command
ELCAS	elevated causeway system	SDO	ship's debarkation officer
FSO	force security officer	SLCP	ship lighterage control point
JLCC	joint lighterage control center	SSO	seaward security officer
JLOTS	joint logistics over-the-shore	TACON	tactical control
IPDS	inland petroleum distribution system	TMO Det	traffic management office detachment
LNO	liaison officer	TSC	theater support command
LSO	landward security officer	USMC	United States Marine Corps
MARFOR	Marine Corps forces		

Figure II-9. Phase 4 — Full Joint Logistics Over-the-Shore Execution



AACG	arrival airfield control group	OIC	officer in charge
BCU	beach clearance unit	OPCON	operational control
BLCP	beach lighterage control point	OPDS	offshore petroleum discharge system
ELCAS	elevated causeway system	SDO	ship's debarkation officer
FSO	force security officer	SDDC	Surface Deployment and Distribution Command
JLCC	joint lighterage control center		
JLOTS	joint logistics over-the-shore	SLCP	ship lighterage control point
IPDS	inland petroleum distribution system	SSO	seaward security officer
LNO	liaison officer	TACON	tactical control
LSO	landward security officer	TMO Det.	traffic management office detachment
MSC	Military Sealift Command	TSC	theater support command
MSCO	Military Sealift Command Office		

Figure II-10. Phase 5 — Joint Logistics Over-the-Shore Sustainment

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CHAPTER III
PLANNING JOINT LOGISTICS OVER-THE-SHORE OPERATIONS

"In war nothing is achieved except by calculation. Everything that is not soundly planned in its details yields no result."

Napoleon

1. Overview

Planning for JLOTS operations is complicated by the need for detailed coordination between the various Service forces involved, the complex logistic activities, joint command relationships, geographic distance between ships and marshalling yards, and other peculiar operational factors. This chapter discusses operation planning procedures and considerations for both deliberate and crisis action planning. Specific deliberate and crisis action planning is addressed in JP 5-0, *Doctrine for Planning Joint Operations*.

2. Responsibilities

Planning responsibilities are outlined in Chapter II, "Organization and Command."

3. Operation Planning

a. **Planning Procedures.** Planning procedures used by the JLOTS commanders should follow those outlined in the 5-0 series of joint publications. As the procedures are executed, **the JLOTS commander must provide early and continuous dissemination of planning data to senior, subordinate, supporting, and supported commanders**. Additionally, staff officers and/or staff noncommissioned officers and LNOs that are to be assigned to the JLOTS staff should be assigned as early as possible in the planning phase.

b. **Concurrent Planning.** Because many of the planning problems are of mutual concern to all participants, concurrent planning is necessary. The allocation of resources, such as available shipping, lighterage, ship-to-shore transfer systems, and LOTS equipment, will be based on the amount of equipment, dry cargo, bulk fuel, and water that must be discharged to meet the needs of supported forces. The plans of supported forces must be sufficiently advanced to provide a basis for determining requirements and for setting discharge priorities.

c. **Selection of LOA.** The combatant commander should select the LOA in conjunction with the JLOTS commander to best support the JFC's concept of operations. Other factors to consider include the availability of facilities for offload, transportation routes, proximity of airfields, and the general operating environment (sea state, surf index, and beach gradient). **For JLOTS operations, the LOA will consist of one of the following.**

(1) **Unimproved Facility.** An unimproved water terminal is a site not specifically designed for cargo discharge. It does not have the facilities, equipment, or infrastructure of a fixed water terminal. An unimproved water terminal facility may lack sufficient water depth, materials handling equipment

(MHE), or berthing space to accommodate strategic sealift vessels with deep draft. Vessels may anchor in the harbor while shallow draft watercraft lighterage carry cargo to or from the vessel. This type of operation is conducted using JLOTS techniques and is normally established when fixed water terminals are not available or to increase throughput to meet increasing requirements of the joint force.

(2) **Bare Beach or Degraded Port.** For this type of operation, lighterage is used to offload ships in-stream (at anchor), and cargo is moved over a degraded port/beach or on to the shore. Port/beach facilities require specifically selected sites to enable lighterage to move cargo to or across the port/beach into marshalling yards or onto clearance transportation. Bare beach operations are conducted when fixed port facilities are not available, damaged, or denied. Additionally, bare beach operations could be used to augment the throughput of a fixed port. In the current threat environment, proliferation and use of chemical, biological, radiological, nuclear and high-yield explosives (CBRNE) weapons and terrorist attacks increases the probability that existing ports may not be available. JLOTS requires significant engineer support to prepare access routes to and from the beach. **Bare beach facilities should be established only when no other terminal facilities are available and should not be relied upon to support major military operations for significant periods of time (in excess of 60 days).**

d. **Throughput Planning. Throughput is the average movement of containers, wheeled vehicles, tracked vehicles, breakbulk cargo, and bulk liquid cargo that can pass through a port or beach daily.** It covers movement from arrival at the port or in-stream, to offloading cargo onto lighters or piers, to the exit or clearance from bare beach or port complex. Throughput is usually expressed in measurement tons (MTs) or square feet. Reception and storage may affect final throughput. The JLOTS commander's goal, when planning for throughput, should be to keep cargo continuously moving from the ships through the marshalling yards to port complex exit. Continuous movement of cargo is a key factor for efficient and effective throughput operations. Some of the major considerations for throughput planning analysis are shown in Figure III-1.

e. **Throughput Rate.** Throughput rate is the quantitative measure of average daily movement of containers, wheeled vehicles, tracked vehicles, bulk liquid cargo, and breakbulk cargo that is moved from cargo ships, containerships, RO/RO vessels, and reverse osmosis water purification units (ROWPUs) and tankers to marshalling yards or storage areas ashore. **There are five distinct and continuous events that occur during throughput operations that impact the throughput rate: ship cargo transfer, cargo movement from ship-to-shore (lighter transit time), beach cargo transfer, cargo movement (transit time) to marshalling yards, and cargo clearance from port complex.** Training and effective communications systems in these five events are key factors to sustaining throughput rates. See Appendix A, "Planning Factors," for further discussion of the five throughput events. JLOTS throughput capacity depends on the following.

(1) The number of suitable anchorages and maneuvering spaces available for offload systems in the offload area is a factor and is based on an evaluation of the weather, water depth, underwater obstacles, surf conditions, tides, tidal ranges, and currents.



Figure III-1. Throughput Planning Analysis Considerations

(2) While selection of a JLOTS location will take into consideration an adversary's capabilities, **the potential consequences of a CBRNE attack require incorporation of active defense, passive defense, and consequence management into planning**. Active defenses will, as a minimum, consider the air, ground, naval, and special operations forces/terrorist capability of the adversary to deliver CBRNE weapons. Passive defenses will incorporate networked sensors and active defense warnings to provide focused defense to the JLOTS area. Passive defense is inherent in each Service component and their

units, but is more problematical for merchant mariners, host-nation support personnel, and civilian support contractors. Provisions must be made to equip and train these individuals if they are to operate in a threat environment. Finally, if a CBRNE attack does disrupt operations, consequence management planning must be in place so as to restore operational capability.

See JP 3-11, Joint Doctrine for Operations in a Nuclear, Biological, and Chemical Environment*, and Appendix J, "Security of Offload Anchorage or Beach Areas."*

(3) **Beach and port capacity** is an estimate of cargo that may be unloaded over a designated strip of shore per day and depends on the number of ships that can be discharged at one time. It is expressed in gallons or barrels for bulk liquid cargo, short tons (STs) for breakbulk cargo, square feet for vehicles, and the number of containers that can be unloaded, segregated or sorted, and placed on the beach or conveyed directly to transportation for movement inland. Beach and port capacity is based on the amount of space for storage and the amount of floating and cargo-handling equipment and personnel available for the discharge operation.

(4) **Beach and port throughput depends on both the offload and clearance rates.** The offload capacity rate is the rate cargo is discharged from lighterage. Beach throughput is a major consideration of JLOTS operations.

(5) **Clearance capacity** is an estimate of the cargo that may be transported inland from a beach or port over the available means of inland communication, including roads, railways, inland waterways, pipelines, and airheads. Clearance capacity includes the STs of cargo and the number of containers and troops that can be moved daily from the beach or port complex to initial inland locations. It is based on transportation furnished by supporting highway, rail, inland waterway, and airlift units. The clearance capacity rate is the rate at which cargo can be moved from beach discharge points or the port complex to inland staging and marshalling areas.

4. Considerations

JLOTS operational considerations include the sequence of work, general considerations, and specific considerations.

a. **Sequence of Work**. The following is typical.

(1) Consider strategic sealift requirements necessary to deploy selected outsized military equipment needed to conduct over-the-shore operations for discharge or loading of designated ships. See Appendix B, "Lighterage Characteristics."

(2) Deploy over-the-shore systems and equipment for sustained container, RO/RO, breakbulk, vehicle, and bulk fuel operations.

(3) Install and prepare over-the-shore cargo transfer systems and equipment, i.e., RO/RO discharge facilities (RRDFs), elevated causeway piers, floating causeway piers, amphibian

discharge site, and beach and pier improvements. Consideration must be given to the types of lighterage to be used, any special fendering requirements, and who is responsible for providing special equipment.

(4) Transition, if necessary, from an amphibious operation to a LOTS or JLOTS operation.

(5) Manage and control movement of cargo in sustained operations over-the-shore.

b. **General Considerations.** The items in Figure III-2 should be considered (see Appendix C, "Ship Characteristics").

c. **Specific Considerations.** The following specific considerations must be addressed.

(1) **Communications Planning.** A communications plan for the effective interface of Service-unique communications systems in support of JLOTS operations must be developed (see Appendix D, "Communications Procedures").

(2) **Ship Discharge Plans.** Discharge plans must be drafted as soon as possible after receipt of the ship's manifests and final stow plan from SDDC and distributed to those units and individuals directly involved with throughput operations. The plans should be made available to other interested parties as required by the JLOTS commander. For further discussion on the ship discharge plan, see Chapter VI, "Ship Discharge Operations."

(3) **Lighterage Repairs and Supply Support.** Planning must provide for the repair and maintenance of lighterage during the operation (see Appendix E, "Support and Maintenance Operations").

(4) **Safe Haven Plan.** A safe haven for both strategic vessels and lighterage should be designated (see Appendix F, "Safe Haven Requirements").

(5) **Lighterage Availability and Utilization Plans.** The availability of lighterage by types, a generalized ship-to-shore movement plan, and procedures to be used in the event of inclement weather should be promulgated.

(6) **Weather Support Plan.** Appendix G, "Sea State, Weather, and Surf," contains information on weather conditions.

(7) **Retrograde Cargo Operations.** Eventually, repairable material for servicing out of country must be loaded on available shipping. When the operation is over, units and supplies could be moved to a staging area for another operation, to the control of a combatant commander with another AOR, or to the continental United States.

(8) **Security Planning** (see Appendix J, "Security of Offload Anchorage or Beach Areas").

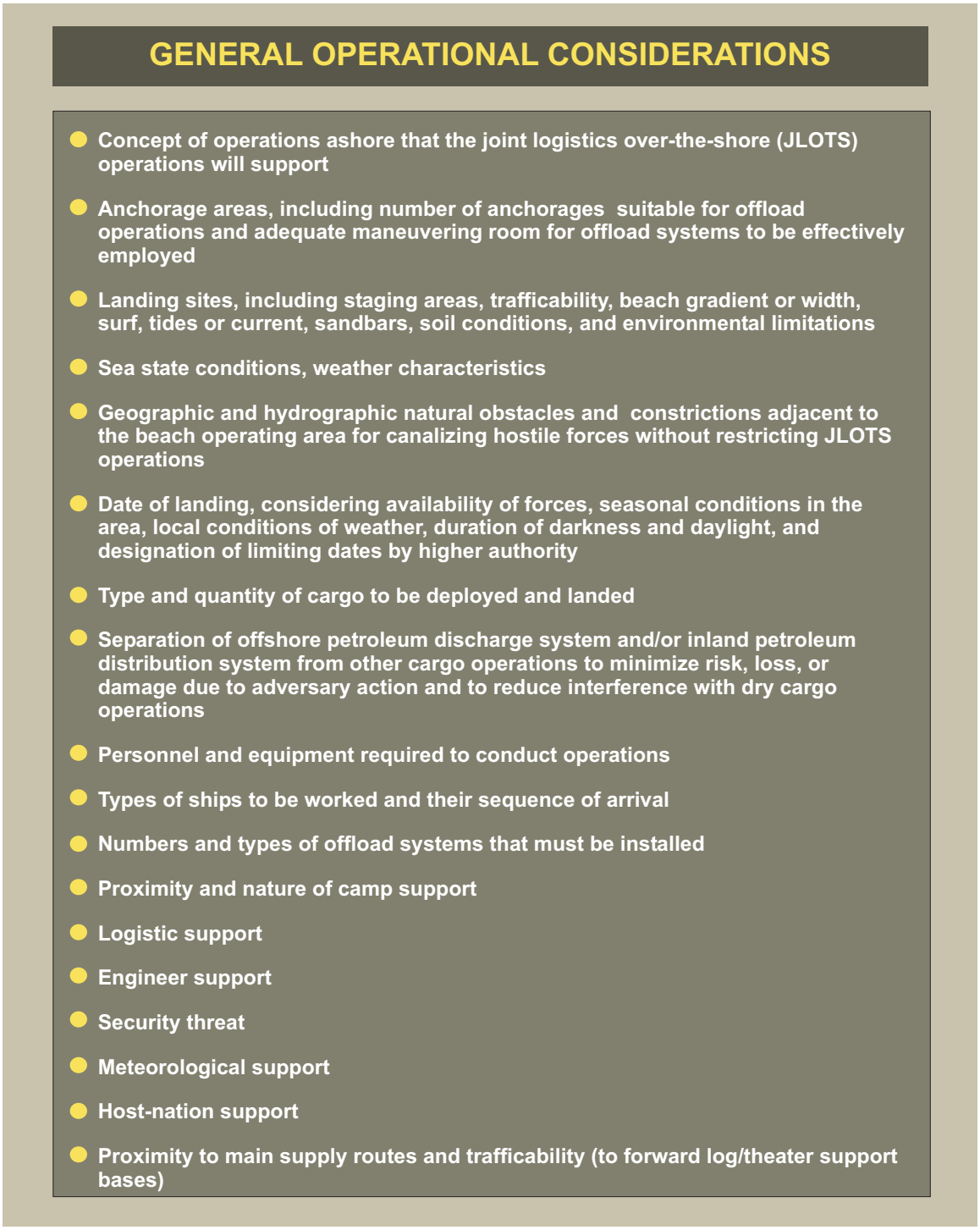


Figure III-2. General Operational Considerations

d. **Environmental Considerations.** The JFC is responsible for the development and inclusion of environmental considerations as part of the planning for terminal operations. **Environmental considerations include the spectrum of environmental media, resources, or programs that may impact on, or are affected by, the planning and execution of military operations.** Factors

may include, but are not limited to, environmental compliance, pollution prevention, conservation, protection of historical and cultural sites, and protection of flora and fauna. In general, environmental requirements can be divided into overseas requirements and requirements applicable in the US, its territories, and possessions, although some US environmental requirements may have extraterritorial application.

(1) By considering environmental issues early during the planning process, the JFC may continue to achieve operational objectives while minimizing the impact on human health and the environment. Failure to consider the environmental impacts of all activities may adversely affect the operation. Potential effects on JLOTS operations include the delaying of the operation's commencement, limited future use of areas, and adverse public opinion, potentially impacting the success of the operation. **Commanders should make environmental considerations an integral part of the mission planning and operational decision-making process.** In the joint arena, it is important that all Services implement these requirements in the same way.

(2) The JFC can develop and publish environmental policies and procedures in the OPLAN or OPORD that will minimize the impact of environmental health effects on JLOTS operations and the operational effects on the environment. By early development of environmental considerations, commanders may become aware of the potential environmental effects or impacts of mission accomplishment while alternatives still exist to address mitigating actions. By planning early, the JFC and his staff will be aware of the environmental requirements, and will be able to plan more efficiently and act accordingly. Furthermore, careful and visible attention to environmental considerations in the conduct of the JLOTS operations and other military operations can assist in shaping a positive image both internationally and domestically.

For more information on environmental planning considerations, see JP 4-01.5, Joint Tactics, Techniques and Procedures for Transportation Terminal Operations*, Annex G to Appendix A and JP 4-04,* Joint Doctrine for Civil Engineering Support.

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CHAPTER IV
JOINT LOGISTICS OVER-THE-SHORE SYSTEMS, FACILITY INSTALLATIONS, AND PREPARATIONS

"To rely on rustics and not prepare is the greatest of crimes; to be prepared beforehand for any contingency is the greatest of virtues."

Ho Yen-hsi
(early commentator to Sun Tzu), c. 500 BC

1. Overview

a. The establishment of JLOTS capability requires a period of preparation and facility installation that will precede the startup of JLOTS operations. This chapter provides a description of the different JLOTS systems. It describes the installation, setup considerations, and requirements to prepare systems for throughput operations with the exception of liquid cargo systems and operations that are discussed in detail in Chapter XI, "Liquid Cargo Offshore Operations." Also included are site preparation considerations for the overall JLOTS operations. Although many current systems are unique to one Service, an increasing number of joint procurements are in progress that will provide similar equipment to more than one Service. This chapter will identify which Services utilize the systems described and any differences between the Services' use of the equipment.

b. **The JLOTS commander must ensure that all available data for a JLOTS operational area be thoroughly researched and validated with a site survey.** A concept of operations should include a detailed soil analysis, prevalent weather conditions, beach gradient, tides, tidal range, currents, and water depth. These factors are further defined as a part of the site survey. Site survey teams need to include engineer personnel to determine trafficability of beach and marshalling yard sites, as well as determining locations for pier or bare beach transfer sites. Dive team hydrographic surveys should verify bottom conditions and location/clearance of underwater obstacles in the vicinity of piers, bare beach splash points, and amphibian discharge sites (ADSs). Separation of the various facilities should allow adequate space for lighters to maneuver and prevent damage should one of the facilities (such as the floating CWP) broach in heavy seas. Planners should consider 200 to 400 meters of separation between beach cargo transfer facilities.

c. The systems available for the conduct of LOTS operations are described in subsequent paragraphs. Following systems descriptions, some considerations in preparation for type operations are covered. This information provides an overview. Individual system manuals should be consulted for detailed planning information.

d. **The Navy's cargo offload and discharge system is comprised of the container offloading and transfer system (COTS) and the offshore bulk fuel system (OBFS).** The COTS system, described here, contains a number of subsystems that are being procured by both the Army and Navy. The OBFS and its major subsystems will be described in Chapter XI, "Liquid Cargo Offshore Operations."

e. **Army LOTS equipment** includes lighterage, RRDFs, causeway systems, cargo transfer and port operations cargo units' MHE, shore-based water storage systems, and a tactical petroleum terminal (TPT). The majority of construction equipment will be provided by supporting engineer units.

2. Container Offloading and Transfer System

a. **COTS.** The COTS is made up of the Navy standard system of components, of which the basic building block is the 5- by 5- by 7-foot Navy lighterage (NL) pontoon can. These cans are configured in various ways to make up lighterage components. Causeways made up in the Navy standard system are typically 90 feet long and 21 feet wide by 5 feet deep. Nonpowered units weigh about 67 tons and powered units weigh up to 106 tons. Other COTS considerations follow.

(1) **Components of COTS are deployed on Navy amphibious shipping, strategic sealift ships, and MPS.** The Navy dock landing ship carries landing craft and landing craft, air cushion (LCAC) in its well deck. Strategic sealift is used to deploy the majority of Army and Navy lighters in the DOD inventory. LASH ships, also capable of carrying lighters, are being phased out. Units require heavy lift capability to get them off the ship. Navy PHIBCBs and Army floating craft companies assist in deployment of the systems from strategic sealift shipping and assemble the systems in theater.

(2) Once assembled, Navy standard causeways and Army modular causeways have nearly identical operating procedures and characteristics. **Navy lighterage and Army modular standard causeways are interoperable and can be connected end-to-end to form causeway ferries and piers.** They are not interchangeable at the component level and cannot be connected side-to-side because of different freeboards and connection systems.

b. **Side Loadable Warping Tug (SLWT). The SLWT is the craft used to install, tend, and maintain other causeway system components.** The SLWT currently exists in the Navy and in the Army. Both are of standard configuration. The SLWT is 85 feet long (5 feet shorter than other Navy standard causeways). Originally, the SLWT was designed for side loading on the Navy's landing ship, tank (LST) class ships; however, the Navy no longer operates LSTs nor maintains the capability to side-load SLWTs. The SLWT is propelled by two water jet propulsion assemblies (WPAs) that occupy the place of the aftmost four pontoon cans and the bow section is made up of 5- by 5- by 7-foot cans. The SLWT is equipped with a dual-drum winch, an A-frame and appropriate rigging, and a stern anchor that provides for its performance of warping tug functions. The SLWTs install the ELCAS, floating causeway, and RRDF systems and perform a wide variety of other functions, such as powering causeway ferries (CFs), emplacing anchors, and performing surf salvage (see Figure IV-1).

c. **Causeway Section, Powered (CSP).** The CSP (see Figure IV-2) is the normal power unit for CFs; the SLWT can also perform the function. The CSP propulsion system is identical to that of the SLWT. However, its hull is 5 feet longer, and it does not have a winch, A-frame, or stern anchor installed.

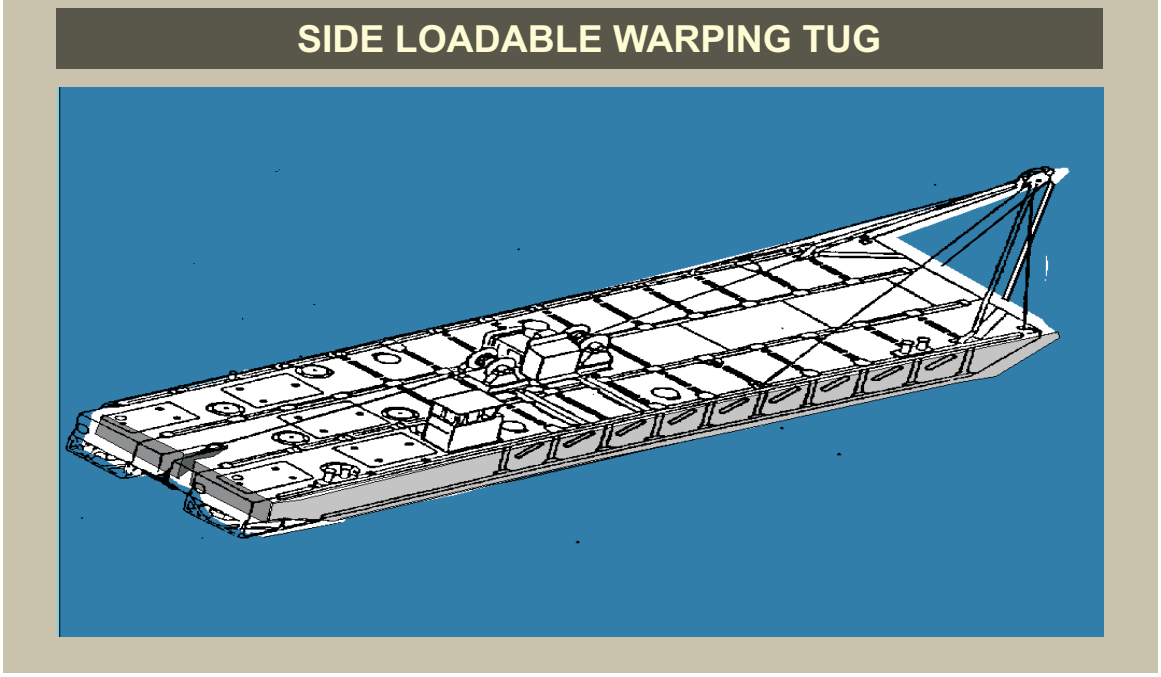


Figure IV-1. Side Loadable Warping Tug

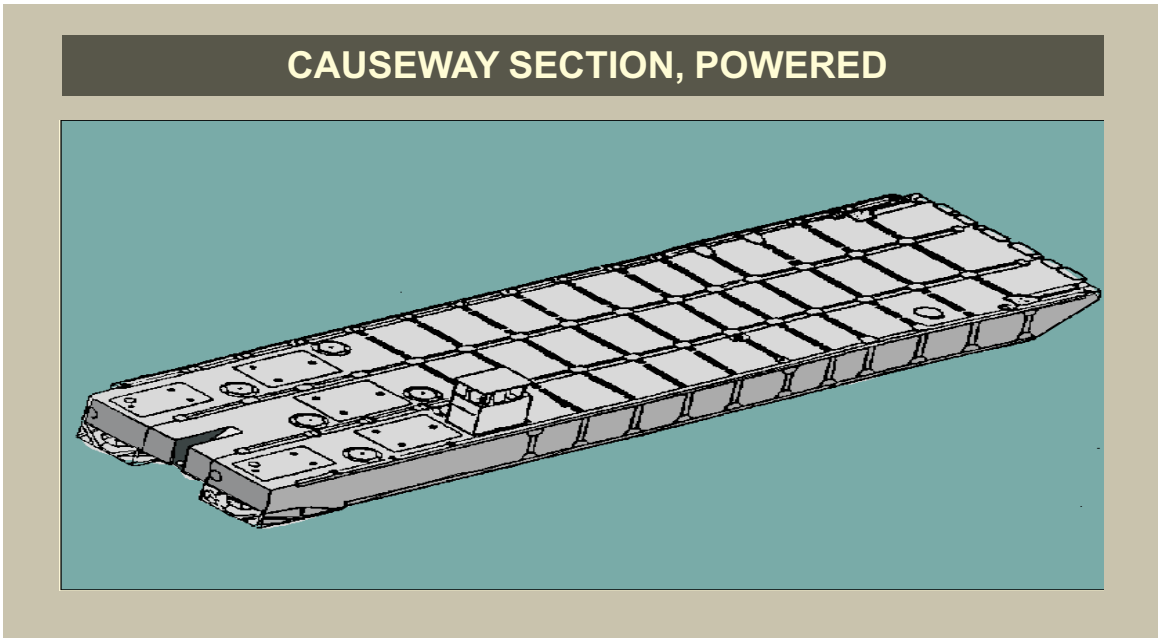


Figure IV-2. Causeway Section, Powered

d. **Causeway Section, Nonpowered (CSNP).** The CSNP is made up of three 7-foot wide and six 15-foot long configurations of the basic pontoon can to produce the 90- by 21-foot sections. The different configurations of the CSNP are described in the following paragraphs.

(1) **Causeway Section, Nonpowered (Intermediate) (CSNP[I]).** The CSNP(I) has flexor units at both ends to permit coupling with other powered or nonpowered causeway sections.

Some sections also have side-mounted flexors (side connectors) to permit assembly into the three-causeway wide by two-causeway long RRDF platforms. The CSNP(I) is shown in Figure IV-3.

(2) **Causeway Section, Nonpowered (Beach End) (CSNP[BE]).** The CSNP(BE) is equipped with a folding beach ramp. It is used as the beach end of CFs, permitting rolling stock to drive off the ferry. It also permits container handlers to drive onto the causeway and pick up containers. Additionally, the CSNP(BE) is used as the shore end of the CWP used during JLOTS operations (see Figure IV-4).

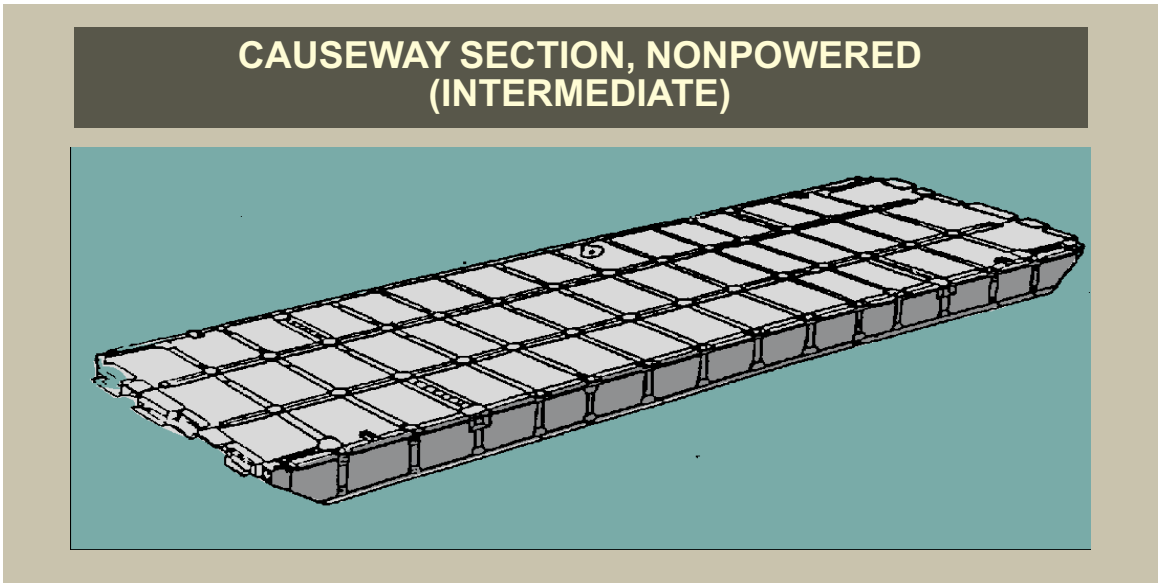


Figure IV-3. Causeway Section, Nonpowered (Intermediate)

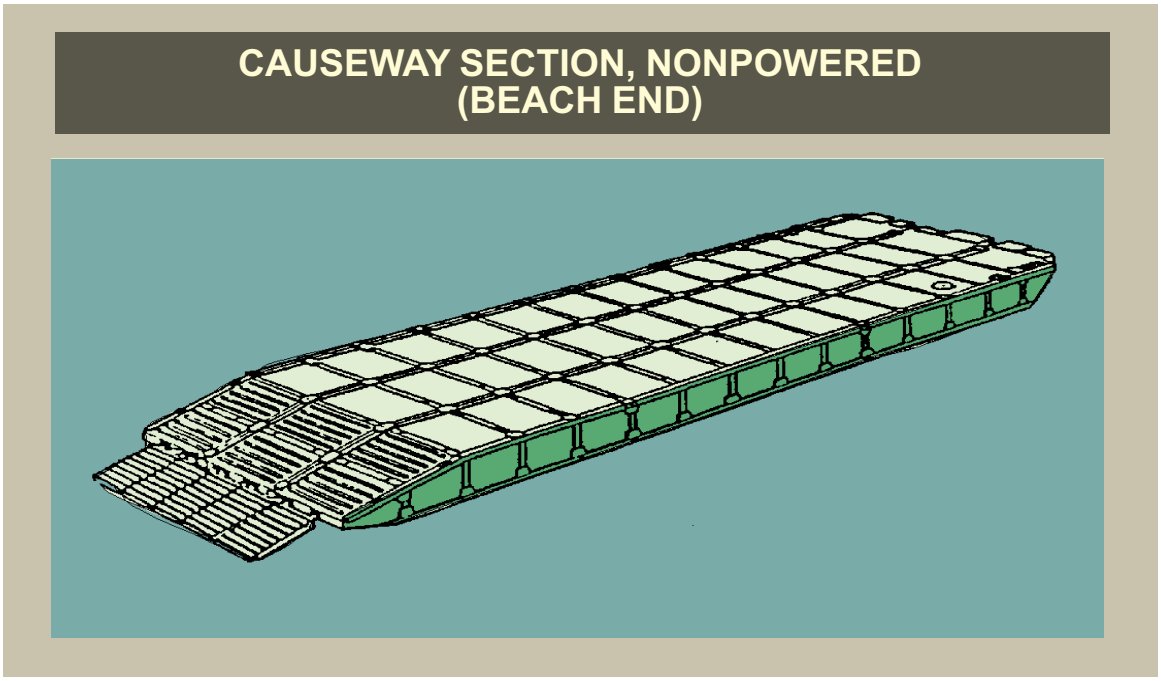


Figure IV-4. Causeway Section, Nonpowered (Beach End)

(3) **Causeway Section, Nonpowered (Sea End) (CSNP[SE]).** The CSNP(SE) is equipped with a sloping notch and rhino horn. It is used as the seaward end of a CWP used by assault forces and the Army and as an administrative pier. The Army also includes one CSNP(SE) as a seventh section of the Army RRDF. The notch is designed to receive the bow of an LST. The rhino horn slips through a hole in the bow ramp of the landing craft, utility (LCU) or landing craft, mechanized (LCM)-8 to hold the LCU or LCM-8 in position while vehicles are embarked and debarked. The CSNP(SE) is shown in Figure IV-5.

e. **Army Modular Causeway System.** The Army's MCS is similar to the NL causeway system. The MCS is the basic unit that comprises the Army's floating causeway systems. These MCSs are the building blocks that make up the MCS CF, RRDF, and the MCS floating CWP (see Figure IV-6).

(1) The MCS is termed "modular" because it is comprised of nine separate modules; six 20-foot end rake modules and three 40-foot quadrafloat modules. The end rakes are fully compatible with the NL end rakes (P8M, P8F, P8C) in that the modular end rakes are right hand (402-MR), left hand (402-ML), and center (402-MC). Two end rakes are attached to a quadrafloat module (400) and these three modules are now called a "string." Three strings make up a MCS which is 80 feet long by 24 feet wide and 4.5 feet in depth (six inches less than an NL section). See Figure IV-7 (end rake) and Figure IV-8 (quadrafloat).

(2) The dimensions of the modules and the International Organization for Standardization (ISO) twistlocks and twistlock receptors allow the modules to be configured into an International Organization for Standardization Package (ISOPAK) which meets ISO 40-foot container standards for length and width. The ISOPAKs can be stowed in 40-foot container



Figure IV-5. Causeway Section, Nonpowered (Sea End)

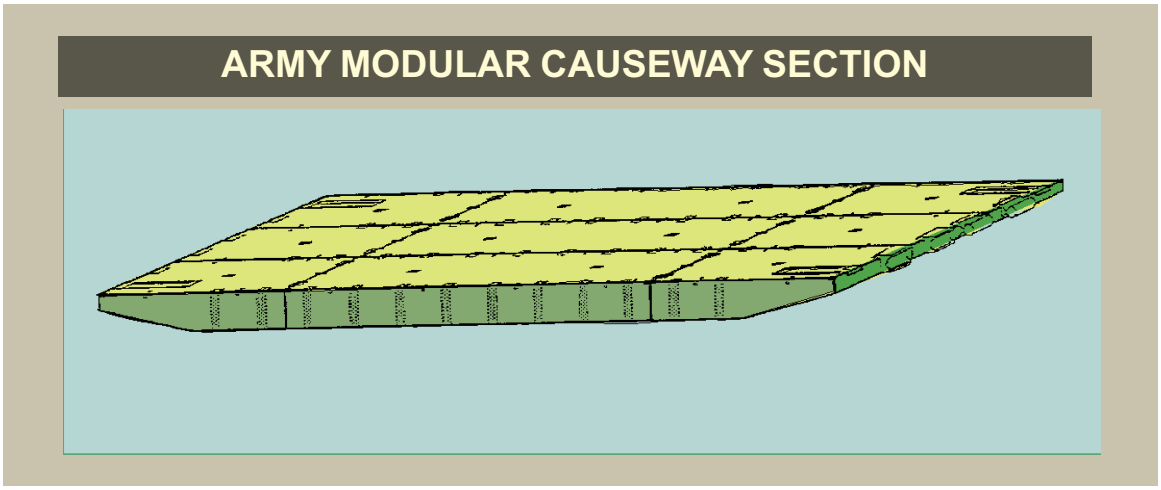


Figure IV-6. Army Modular Causeway Section

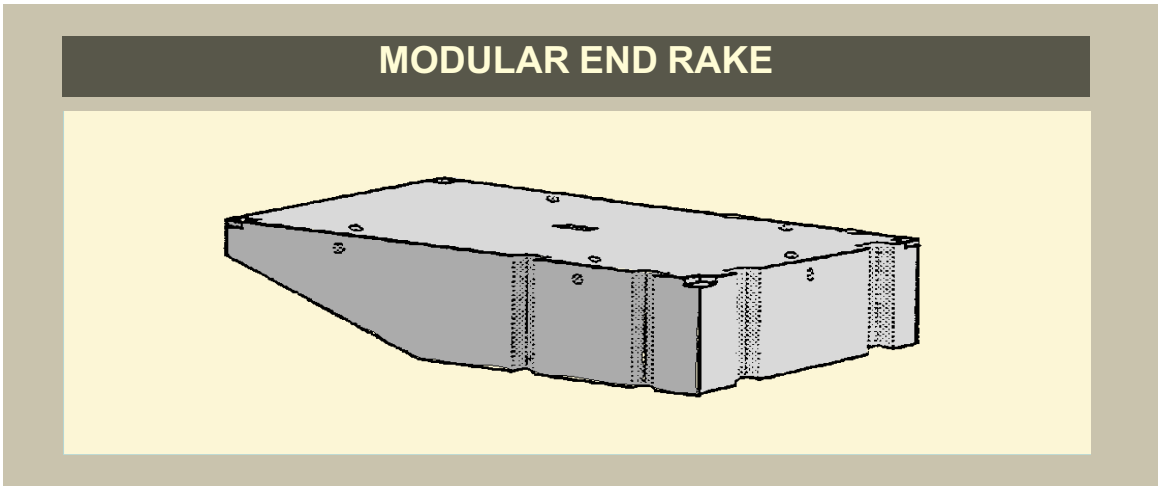


Figure IV-7. Modular End Rake

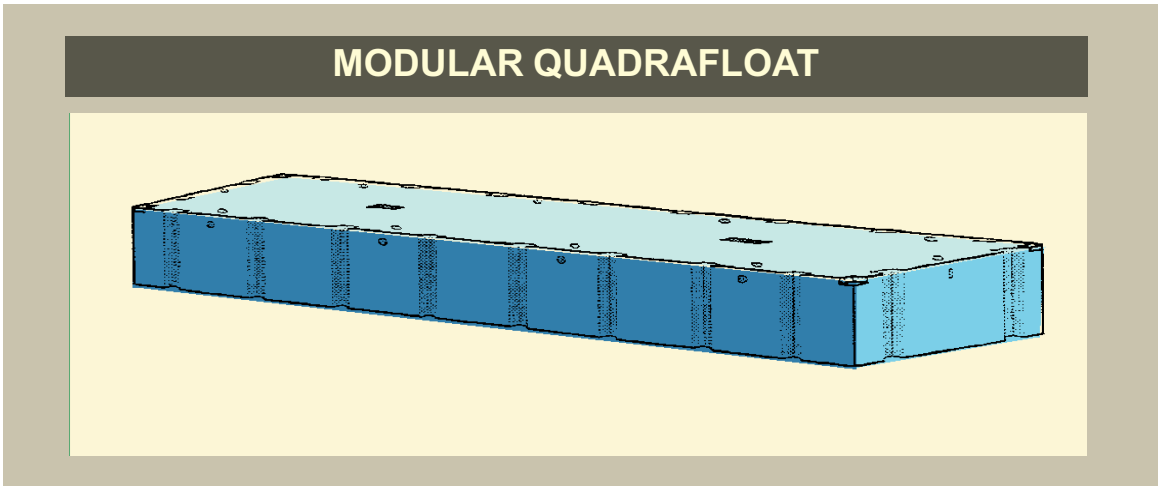


Figure IV-8. Modular Quadrafloat

cells. The total weight of an ISOPAK is approximately 47,000 pounds (23.7 tons), and a complete MCS weighs approximately 142,200 pounds (71.1 tons). A rough terrain container handler (RTCH) has the capability to easily pick up and move the individual ISOPAKs (see Figure IV-9).

f. **Navy RO/RO Discharge Facility.** As shown in Figure IV-10, the RRDF provides a means of debarking vehicles from RO/RO ships in-stream to lighters. It consists of six CSNP(I) joined together in a configuration of 2-long, 3-wide sections to form a 65-foot by 182-foot Navy standard RO/RO platform. Vehicles can be driven from the ship onto the platform and then onto CFs, LCUs, or logistics support vessels (LSVs) for delivery to the beach. The RRDF requires the services of one SLWT and one CSP for assembly, operations, and maintenance and a 6,000-pound forklift is required during assembly. Assembly time is approximately 6 to 8 hours. Detailed procedures for RRDF assembly, installation, and operation are provided in Naval Facilities Engineering Command Technical Manual (TM) 9CE-023.02, *Installation/Retrieval and Operation/Maintenance Instructions for the RO/RO Discharge Facility*.

g. **Army Modular RO/RO Discharge Facility.** The Army's modular RRDF has no standard configuration. Design of the facility has been an evolutionary process facilitated by joint operational tests and evaluations. It is constructed with eight sections forming a rectangle and two sections end-to-end inboard and aft. A sea end section is placed one string outboard of the end-to-end sections. Fenders are placed along the outboard sides of the two end-to-end sections. The "finger pier" configuration just described provides stable side mooring, keeps the lighter from getting under the ship's counter, and provides lighter masters more confidence when approaching and mooring. Detailed procedures for RRDF assembly, installation, and operation are provided in Army TM-55-1945-20114, *Installation/Retrieval and Operation/Maintenance Instructions for the RO/RO Discharge Facility*. Assembly time is approximately 6 to 8 hours. RRDF considerations include the following.

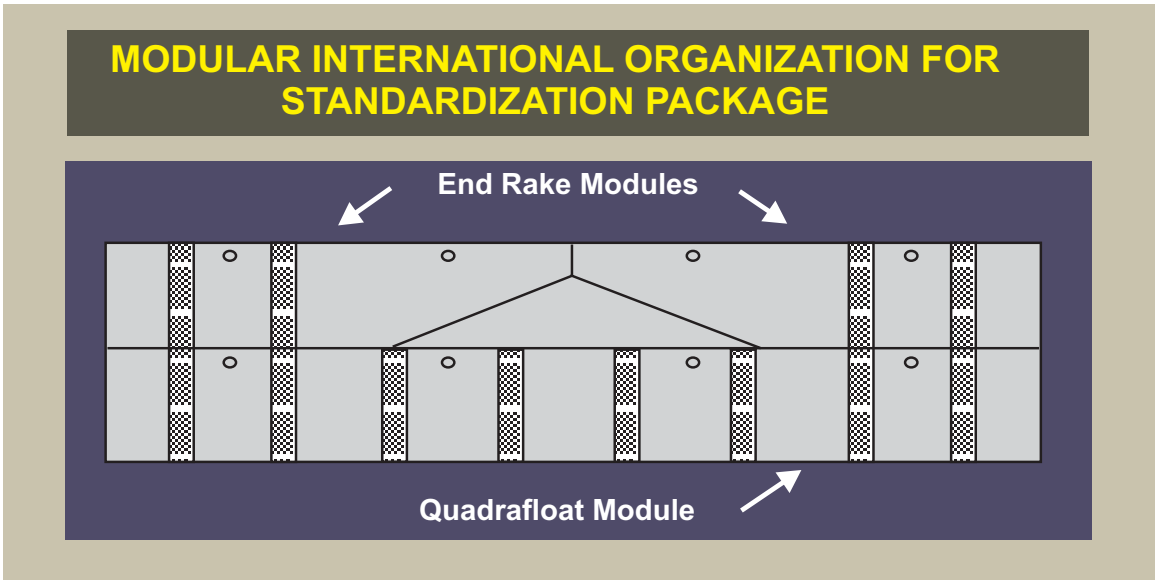


Figure IV-9. Modular International Organization for Standardization Package

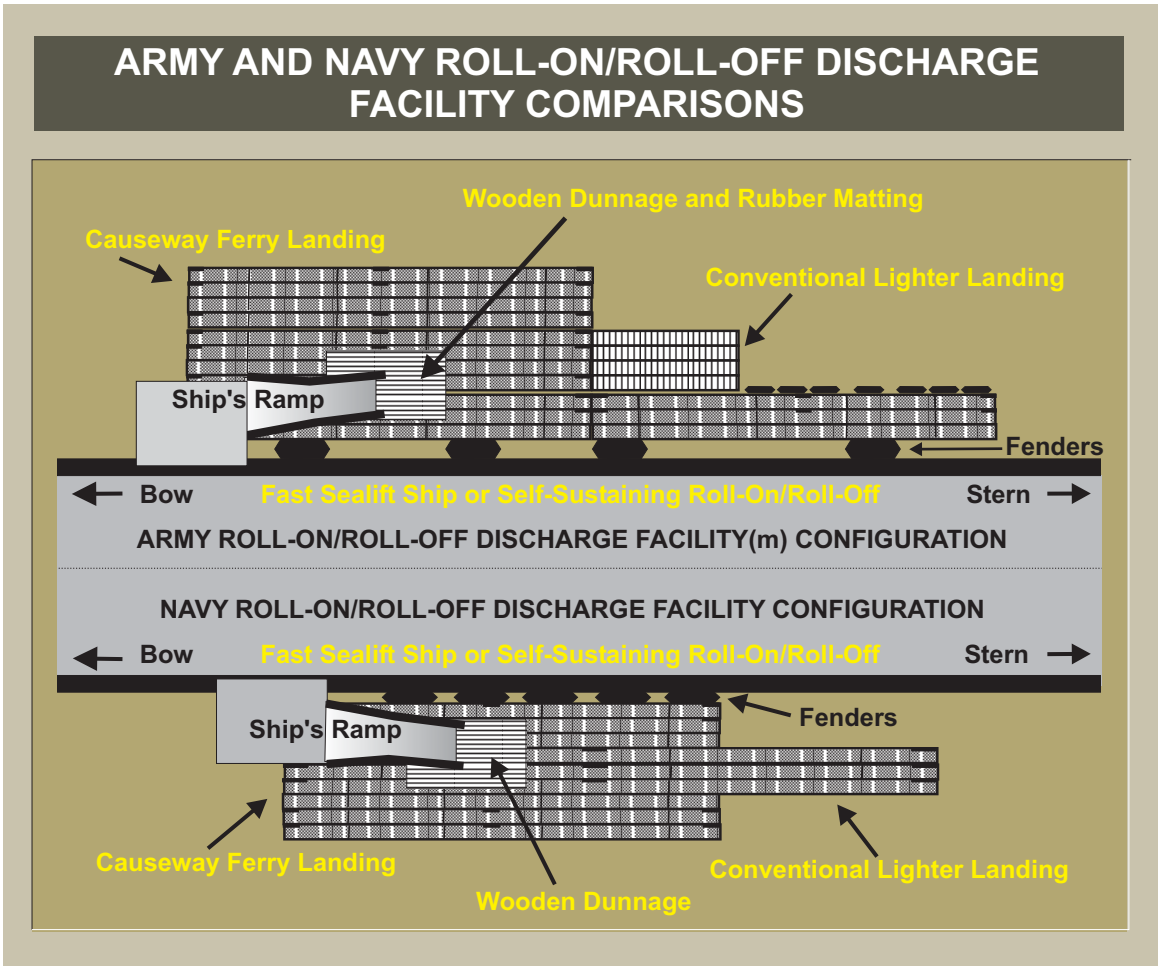


Figure IV-10. Army and Navy Roll-On/Roll-Off Discharge Facility Comparisons

(1) **Special Considerations.** The RRDF may be installed moored to a non-self-sustaining ship in sea state 0-1 and into a self-sustaining ship in sea state 0-2. The RRDF can be safely operated through sea state 2. The sea current limitation on the system for installation and operation is 4 knots.

(2) **Components and Capabilities.** The principal elements of the RRDF are RO/RO platform, ship fendering system, and dunnage. RRDF component and capability considerations include the following:

(a) The RO/RO platform is composed of six Navy or seven CSNPs to form the floating platform. The platform can be fender-moored to the ship by mooring lines or stand-off moored by using SLWTs. The platform provides a base for the fender system and the free end of the ramp. It also serves as the interface roadway between the ramp and the lighterage, which will move the rolling stock ashore.

(b) The ship platform fendering system is composed of two foam-filled cylinders, a pivoting bearing structure, an adjustable webbed support structure, and a foundation frame

with mounting pedestals. Three fender systems are mounted at the shipward end of the transfer platform.

(c) Use of heavy dunnage or rubber matting is required to prevent wear and chafing between the ramp (either ship or RRDF) and the platform. Detailed procedures for RRDF assembly, installation, and operation are provided in Naval Facility Engineering Command (NAVFACENGCOM) TM-9CE-023.02 and Army TM-55-1945-20114, *Installation/Retrieval and Operation/Maintenance Installations for the RO/RO Discharge Facility*.

h. **Elevated Causeway System.** The ELCAS is a key element in the movement of containerized cargo ashore in an unimproved beach area. It provides the capability to unload lighterage from beyond the surf zone and where difficult beach gradients exist, such as sandbars, that may cause conventional lighters to ground far from a dry beach. The ELCAS is also capable of removing rolling stock (within the capacity of the container crane) and breakbulk cargo from lighters. The ELCAS, also called the ELCAS (modular) or ELCAS(M), is easily transportable by MARAD RRF shipping and the commercial intermodal transportation system since it is constructed using ISO-compatible modules.

(1) **The ELCAS (M) is a temporary pier and roadway consisting of connected 8-foot by 40-foot and 8-foot by 20-foot ISO-compatible modules, elevated on piles and extending seaward across the surf zone up to 3,000 feet from the beach.** It provides for throughput of containerized cargo offloaded from lighterage at the pierhead and carried by tractor trailers to the beach. The system is constructed in an elevated position above the water by cantilevering one section at a time. In addition to the ISO modules, the system includes piling and pile driving and extraction equipment, fender systems, a beach ramp, lighting systems, safety equipment, cranes, RTCHs, and turntables for maneuvering truck trailers at the pierhead during use.

(2) The ELCAS (M) can extend up to 3,000 feet seaward until a mean high water depth of 20 feet at the end of pierhead is reached. The 240-foot by 48-foot pierhead is capable of round-the-clock simultaneous lighterage offloading operations on both sides. Installation of a 3,000-foot system is accomplished within 10 days (24-hour operations) in environmental conditions through sea state 3 and 16-knot winds. The system can withstand severe storm conditions, including 75-knot winds, 9-foot surf, and 2-foot storm surge with a maximum of 24 hours warning for preparation.

(3) The ELCAS site requires the pierhead be located beyond the surf zone and at a mean low water (MLW) depth of 12 feet. Also, the ELCAS deck should be 20 feet above MLW to survive high storm tides. The type of seafloor and seafloor gradient will dictate total footage of pile and number of pile splices required to support ELCAS and its traffic. Rock bottoms should be avoided; sand is the most desirable substrate for pier installation; clay seafloors are the least. After selecting the general area, soundings from the beach out to the 20-foot water depth should be taken within a week of the ELCAS installation. Usually, the same type of bottom density (soil composition) will not be found from the beach to the pierhead. In addition to seafloor investigation, the type of beach is also important. A gentle slope is desired for location

of staging areas, equipment storage, work equipment, and messing shelter areas. Weather reports, prevailing currents, tide table, and seafloor samples should also be checked for the ELCAS installation timeframe. Historical data and the surrounding terrain and environment may be used by operators to determine subsurface soil properties. Underwater construction teams (UCTs) can conduct hydrographic surveys to give below water line topography and can take soil samples, in and out of the water, to determine subsurface soil properties.

3. Special Equipment and Material

Descriptions of key items of equipment to be used in the preparation of the LOA are discussed in this section.

a. **Terminal Unit MHE.** Terminal service units have a limited beach preparation and construction capability. Although terminal units are responsible for beach preparation, engineer combat-heavy and port construction engineer units will provide supervisory personnel and perform most engineering construction tasks in the operational area. Construction equipment organic to terminal units includes dump trucks and bulldozers. Bulldozers are used for several purposes, including surface preparation, berm construction, and vehicle MHE recovery. Tires can be placed on the bulldozer's blade to push landing craft back in the water.

b. **Rough Terrain Container Handler.** Marine Corps landing support units and Army cargo transfer units with container-handling capability are equipped with RTCHs. RTCHs are rated at approximately 50,000 pounds and are capable of handling all standardized container sizes on beaches and within terminals. RTCHs cannot discharge containers from landing craft, other than LSVs, but are ideal for discharging containers from single or double-wide CFs. For more information on Army operations in this area, see Field Manual (FM) 55-15, *Transportation Reference Data*, and FM 55-60, *Army Terminal Operations*. Figure IV-11 shows the RTCH and various other MHE.

c. **Yard Tractors and Trailers.** Yard tractors are designed to shuttle trailers within terminals rather than along highways. These vehicles are highly maneuverable but cannot operate on loose sand and they have difficulty on sloped surfaces such as CF beach ramps and the ELCAS turntable ramp. These tractors have an automatic, hydraulic lift fifth wheel that allows coupling and movement of semitrailers without retraction of landing legs. Terminal units are also equipped with M871 or M872 semitrailers. These trailers can transport either breakbulk cargo or containers. The M871 can transport one 20-foot container. The M872 can transport two 20-foot containers or one 35- to 40-foot container.

4. Beach Preparations

a. Most major beach preparations will be accomplished by the engineer unit assigned to the task. To ensure a successful JLOTS operation, the following beach preparation tasks must be conducted before JLOTS units occupy an undeveloped beach.

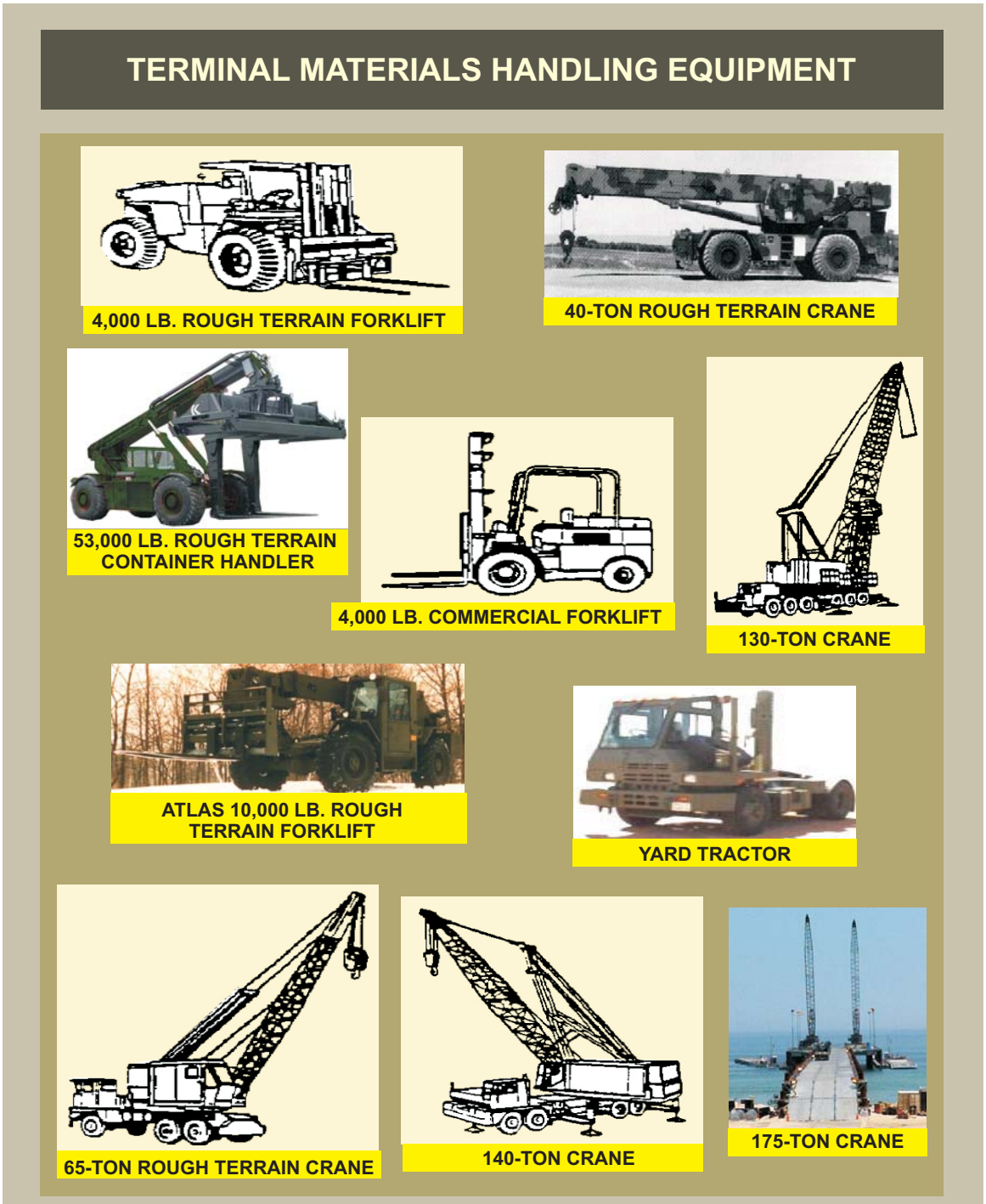


Figure IV-11. Terminal Materials Handling Equipment

(1) **Beach Reconnaissance.** This task locates a site for JLOTS systems that meet the following criteria.

(a) Accessible to main supply routes.

(b) Accessible for lighterage and suitable for ELCAS installation.

(c) Suitable for beach crossing roads and beach hard stands.

(2) **Hydrographic Survey.** A hydrographic survey is one of the first beach preparation tasks required. The information gained on beach gradient and underwater topography will be used during other beach preparations. The survey will be conducted by Navy UCT or Army divers.

(3) **Preparation of Lighterage Discharge Sites.** Debris or rocks may have to be removed from lighterage discharge sites. Also, where shallow gradient prevents craft from dry ramp discharge, sand ramps must be constructed and maintained. It may be necessary to install beach markers and lights.

(4) **Amphibian Water Entry and Exit Points.** Water entry and exit points may be prepared for air cushion vehicles or debris removal for wheeled amphibians.

(5) **Beach Roadways.** Beach roadways will be constructed where the bearing capacity of the beach surface is less than the ground pressure of the MHE or RO/RO cargo. Roadways may be constructed by using beach reinforcement expedients, including mobility matting, sand grid, or local materials such as gravel or crushed rock. Airfield steel planking and UNI-MAT (a commercial wooden interlocking mat system) are also excellent beach surfacing materials. Beach roadways must be wide enough for the largest vehicle and must be constructed with areas for passing and turning.

(6) **Beach Exits.** The number and size of beach exits are related to the type and quantity of vehicular traffic required for the operation. Beach exit construction will usually require bulldozing roadway cuts through sand dunes and filling in swamps or creeks behind the beach. At least one beach exit will be constructed to handle the largest vehicle that will be moved off the beach.

(7) **Bulk Fuel and/or Water Hoses (Onshore Preparation).** Bulk fuel and water delivery hoses will be floating or sunk to the bottom, depending on the system being installed. The lines will be buried at the surf line to prevent abrasion. Burying of bulk fuel or water lines will normally be accomplished by the unit tasked with installing the system. Required preparations are detailed in the TMs for the systems involved.

(8) **Beach Interfaces for Temporary Causeways and Piers.** Interfaces, such as sand or expedient material ramps, may be required for the efficient use of causeways or piers. The composition and gradient of the beach will be the deciding factors in determining the type of interface, if any, that is required.

(9) **Ammunition Storage.** Temporary storage facilities must be provided in order to segregate ammunition from other cargo.

(10) **Heliports.** Helicopter landing zones will be established when onward movement of cargo by helicopter is required.

b. Preparations should be made for the following amphibian.

(1) **Landing Craft, Air Cushion.** The LCAC can operate over most beaches with no improvements required. Consideration should be given to maintaining separation of beaches and transit routes used by air cushion vehicles and conventional displacement craft. Because of the LCAC aluminum structure, lift-on/lift-off operations are discouraged. It is best to conduct RO/RO operations only.

(2) **MHE Considerations.** All amphibian discharge sites must have room for a roadway on either side of MHE operating at the transfer point to eliminate interference between the amphibian and the cargo truck. The sites must also have firm, level ground for crane and MHE operation. Surface expedient may be required to achieve this. Preparation of discharge sites can be accomplished by terminal service companies with the aid of engineer or naval construction battalion support, if required.

c. The following considerations apply to preparing the marshalling area.

(1) **Container Marshalling Area.** With more military ocean-going cargo now being containerized, facilities must be provided to store containers temporarily after they are discharged from lighterage and to prepare them for onward movement. A marshalling area is provided for this purpose and it is similar to a fixed-port container transfer facility. However, in addition to the space for storing containers temporarily, the area must have space and facilities for repacking and repairing the containers and for performing any other operational or administrative functions required to marshal them. Radio frequency identification (RFID) capability is also required, to include interrogators at key entry/exit points, and writers to be able to re-tag in case of breakbulk operations. An area approximately 200 by 300 meters is required for every 1,000 single-tier 20-foot container unit. This includes space for a 4-foot aisle between container tiers, a 25-foot corridor on each side of the block of containers, tractors to back in and straddle containers, cranes or RTCH to deliver and pick up containers, and an area for unstuffing. A separate area is required for the storage of ammunition containers. Empty containers coming back must be stored for retrograde. Responsibility for construction of these areas lies with the supporting combat heavy engineer units and terminal service units with their earth-moving equipment.

(2) **In-Transit Storage Area Preparation.** In-transit storage areas are used to temporarily store cargo requiring further transportation to units or depots. In-transit storage areas should not become depots. Only cargo awaiting clearance transportation should be stored in these areas, not cargo awaiting issue for use. Once in-transit storage areas begin to be used as depots, the resulting congestion causes the operation's primary mission of discharging ships to cease. Support engineers are responsible for constructing in-transit storage areas and access routes. Earth-moving equipment with operators from some terminal units may also be available for this construction. FM 55-50, *Army Water Transportation Operations*, and FM 55-60, *Army*

Terminal Operations, contain further information on Army operations in this area. In-transit considerations are as follows.

(a) In-transit storage points are located to provide easy access from discharge points and to clearance transportation nets. Storage areas can be located as far away from the beach as necessary as long as vehicle turnaround time does not result in cargo backing up at discharge points. Also, when estimating the capacity of storage areas, the operating capacity is considered to be 50 percent of the total capacity.

(b) Cargo is segregated within and between storage areas. The most important criteria for segregating cargo is hazardous material, including ammunition. When possible, breakbulk cargo and containers are stored in separate areas because different equipment is used in handling these types of cargo. Depending on the situation, other criteria used to segregate cargo include priority, mode of clearance, and next destination.

(c) In-transit storage areas must be clearly marked to assist drivers in delivering or picking up cargo. These markers are also used at beach lanes when division of shore discharge points by type of cargo is efficient or necessary. If personnel are not thoroughly familiar with military markings, plain language is added to the signs.

(3) **Bulk Fuel or Water Tank Farm.** Construction of a road network, berms, and pads for bag farms are engineer responsibilities.

(4) **Ammunition Sites.** Each storage installation should be arranged into three separate storage areas, when possible. Each should also provide for dispersion of stocks to facilitate receipt, issue, and inventory operations. The following areas should be included in any layout plan: bivouac area, ammunition supply point office, vehicle holding area, vehicle assembly area, demolition area, segregation area, inert salvage area, surveillance maintenance area, and the ammunition sling-out area.

Refer to FM 9-38, Conventional Ammunition Unit Operations*, for additional information.*

d. **Support Maintenance Facility Preparation.** JLOTS support services and facilities should be established using the following guidelines to assist in the development of an efficient operation.

(1) Support services are located in areas that do not interfere with operations.

(2) Messing and billeting facilities for JLOTS personnel should be close enough to the operational area to ensure that shift changes and meals are accomplished without consuming excessive time.

(3) First aid facilities are centrally located in the operational area to permit ease of access when required.

(4) Refueling and maintenance of watercraft may be accomplished at the safe haven, at the beach from the floating causeway, the ELCAS, or from other lighterage (see Appendix E, "Support and Maintenance Operations"). These processes should be designated in the OPORD and done ashore, if possible.

(5) Preparations of the area will be accomplished by the lowest echelon unit with equipment and personnel assets capable of accomplishing the task in the particular area designated.

(6) As with most CSS units, a transportation group's subordinate units are dispersed over a wide area. Support is provided to these dispersed units by the designated area support group.

e. A summary of responsibilities and operational conditions for JLOTS facilities and equipment is shown in Figure IV-12.

RESPONSIBILITIES AND MAXIMUM CONDITIONS FOR INSTALLATIONS AND OPERATIONS					
EQUIPMENT	INSTALLED BY	OPERATED BY	MAX SS FOR INSTAL. 3	MAX SS FOR CGO. OP. 3	REMARKS
LCM-8	N/A	ACU/MBCo.	N/A	2	Note 1
LCU -1600	N/A	ACU	N/A	2	Note 1
LCU -2000	N/A	HBCo.	N/A	2	Note 1
LSV	N/A	LSV Det	N/A	2	Note 1
CSP+1,2, or 3	N/A	Causeway Co.	2	2	Note 1
LARC-V	N/A	BMU/UCT	N/A	2	Note 1
LCAC	N/A	ACU	N/A	2	Note 1
RRDF	ACB/Tm LM	Causeway Co.	2	2	
ELCAS	ACB/UCT	ACB/BMU/ TSCo.	2	3 to 5 for survivability	Note 2
CWP	ACB/Tm LK	Causeway Co.	2	2	
OPDS	ACB/UCT Army Engrs.4	Tanker Crew	3	2	Note 4
ABLTS	ACB/UCT	ACB	3	3	

Legend
ABLTS = amphibious bulk transfer system, ACB = amphibious construction battalion, ACU = assault craft unit, BMU = beachmaster unit, CGO = cargo, CSP = causeway section, powered, CWP = causeway pier, ELCAS = elevated causeway system, EPCCo. = Army engineer port construction company, HBCo. = Army heavy boat company, LARC = lighter, amphibious resupply cargo, LCAC = landing craft air cushion, LCM = landing craft, mechanized, LCU = landing craft, utility, LSV = logistics support vessel, MBCo. = Army medium boat company, OP = operations, OPDS = offshore petroleum discharge system, OUB = OPDS utility boat, POCD = Army Port Operations Cargo Detachment, RRDF = roll-on/roll-off discharge facility, SS = sea state, SS (number) = sea state (number), Tm = Army transportation watercraft Teams LK and LM, TSCO=Army terminal service company,UCT=underwater construction team.

Notes
1. There are no mandated sea state limits for lighterage operations; these are recommendations based on test data.
2. Maximum sea state for ELCAS operations is 2, survival in up to sea state 5. Note that high wind will also effect ELCAS crane operations and could limit cargo off-load even when sea states are 2 or below. Additionally if causeway lighterage cannot transit due to sea state ELCAS operational capability is limited to LCU cargo movement of 20-foot containers.
3. Sea state refers to the Pierson-Maskowitz scale shown in Appendix G.
4. Maximum sea state for OPDS installations is 2 (limited by Navy OUBs). OPDS operations (fuel pumping from tanker) is up to sea state 5, survival in sea state 7.

Figure IV-12. Responsibilities and Maximum Conditions for Installations and Operations

CHAPTER V
OCEAN TRANSPORT

"All was ruled by that harsh and despotic factor, shipping."

Winston Churchill
***The Grand Alliance*, 1950**

1. Overview

Strategic sealift is the principal delivery means for the equipment and logistic support of land forces. **Strategic sealift employed in support of JLOTS operations includes MSC common-user ships, US Maritime Administration owned vessels, namely the RRF vessels, and pre-positioning ships.** These ships are capable of conducting port operations and LOTS operations from anchorage. They deliver cargo in accordance with requirements based on cargo required delivery dates, the tactical situation, and ship capability and availability. This chapter discusses the elements essential to the reception of strategic sealift ships in the LOA.

2. Assigning Anchorages

Ships are normally assigned anchorages that facilitate cargo throughput with due consideration to ship characteristics, oceanographic and topographic conditions, cargo type, ammunition ship anchorages, lighterage routing scheme, and security considerations and threat environment. When not depicted on nautical charts, anchorages are usually assigned by the factors shown in Figure V-1. If all other considerations are suitable, a distance off the beach of approximately 2,000 yards is good for anchoring ships and conducting an efficient discharge. Watercraft may be assigned to take soundings of selected anchorages to confirm charted depths. Specific ships may be assigned to positions alongside the T-ACS. Assignment will be made by the JLOTS commander prior to the ship's arrival in the offload area. Anchorage planning factors in Appendix A, "Planning Factors," will be considered. Additionally, anchorage assignment should consider the lighterage mix to be used to offload that ship's particular cargo. For example, CFs are efficient for vehicles and containers, and LCM-8s are efficient to offload ships with breakbulk cargo. An offshore anchoring or mooring plan is part of an efficient JLOTS operation.

a. **Oceanographic and topographic conditions nearshore and offshore hydrographic conditions will significantly influence ship anchorage positions.** Ship anchorages are usually located directly off the selected landing beaches to facilitate expeditious offloading at reasonable distances with suitable sea area, water depth, and bottom characteristics. Offshore gradients should allow anchoring close to shore to minimize lighterage distances consistent with ship safety. Strategic sealift ships do not generally have the maneuverability of naval amphibious ships. They may be more sensitive to offshore currents and nearshore swell conditions. Principal oceanographic and topographic influences in the assignment of anchorages include.

(1) Oceanographic features of offshore areas.

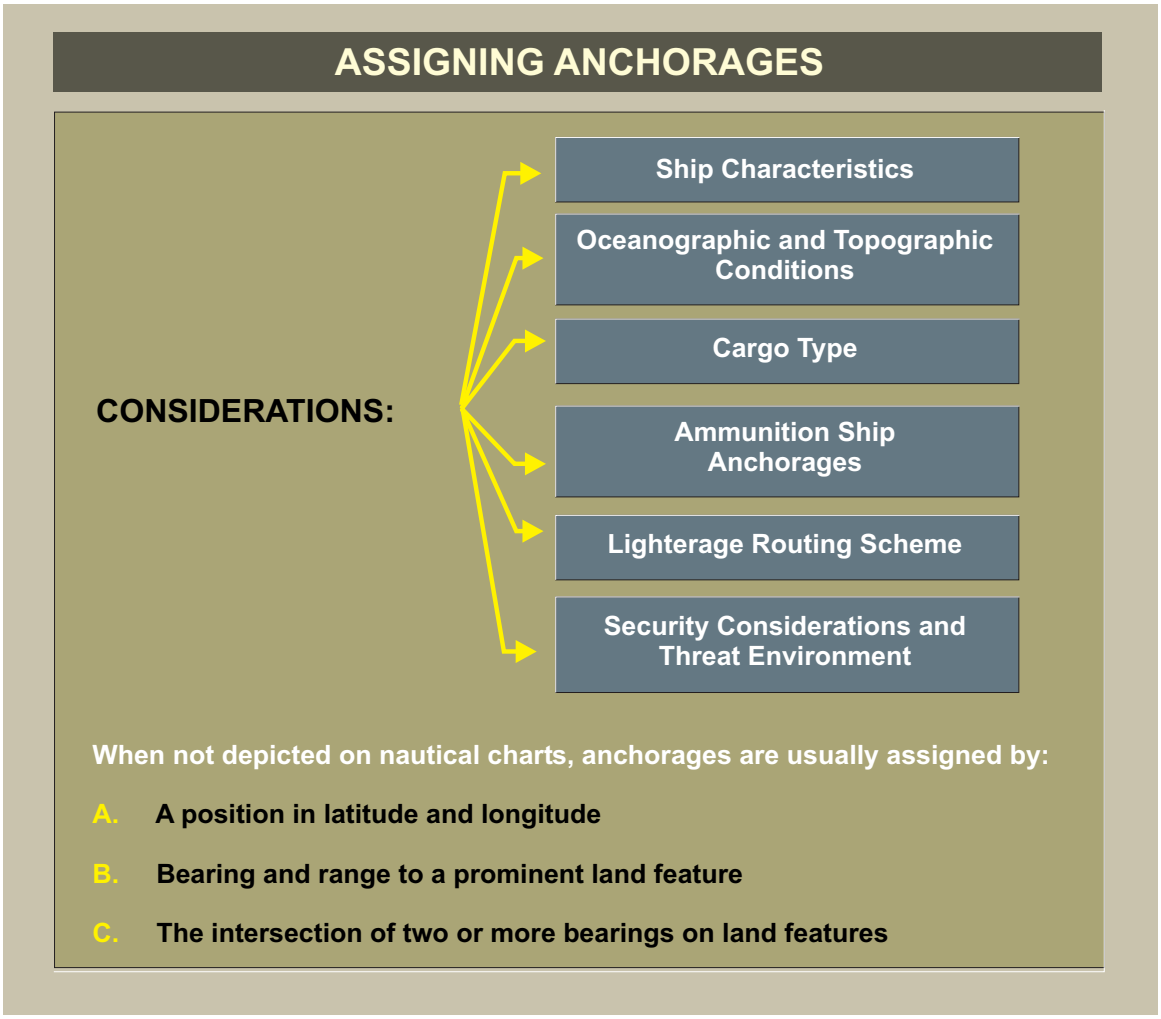


Figure V-1. Assigning Anchorages

(2) Configuration of the coastline.

(3) Weather, climate, tidal, swell, and current conditions.

(4) Proximity of compatible beaches or lighterage seaward approaches to ports.

b. **Cargo Type.** Ideally, strategic sealift ships should be anchored near the beaches over which their cargo will cross. Effective positioning of ships will result in increased efficiency in lighterage control and increased cargo throughput.

c. **Ammunition Ship Anchorages.** In the operational area, anchorage locations for ammunition ships are designated by the JLOTS commander in coordination with the Coast Guard liaison officer and should normally comply with host-nation restrictions.

d. **Lighterage Routing Scheme.** A large number and variety of lighterage are expected to be operating. Therefore, anchorage assignments should take into consideration established

offshore traffic patterns which are critical to positive lighterage control and to smooth and safe operations. Appendix A, "Planning Factors," provides utilization considerations of lighterage by type for various types of cargo.

e. **Security Considerations and Threat Environment.** Anchorage positions must also take into consideration potential hostile actions, such as CBRNE attacks, mining capability, small-arms range, swimmer attacks, and small craft attacks. They must be protected from air and submarine attacks as well. Anchorages should be positioned to afford maximum protection to the ships anchored therein. MIUW units and US Coast Guard forces may be available to accomplish functions outlined in Appendix H, "Personnel Movement in the Logistics Over-the-Shore/Joint Logistics Over-the-Shore Operation Area" and Appendix J, "Security of Offload Anchorage or Beach Areas," if tasked, as specified in Chapter I, "An Overview of Logistics Over-the-Shore Operations."

f. **Procedures.** Ships arriving for discharge will be directed to an anchorage by the supporting Navy component commander based on anchorage assignments made by the JLOTS commander.

3. Ship Arrival Meeting

a. Prior to the arrival of the ship, a copy of the ship's manifest will be forwarded to the JLOTS commander. These documents provide detailed information on the quantity, type, and location of the cargo aboard the ship. Planners use this information to develop ship discharge and lighter usage plans.

b. **A ship arrival meeting is the first and most important of meetings that should be conducted between ship's crew and the debarkation officer.** This first meeting should include the ship's master and mates, appropriate representatives of the JLOTS commander (such as the debarkation officer and/or officers in charge (OICs) of the JLCC and SLCP), and the MSC representative. Additional representatives such as customs, surgeon and/or veterinarian, host nation, or military police may also be required to attend. The meeting is conducted as soon as possible after the arrival of the ship to introduce key personnel, discuss working relationships (see Appendix K, "Command, Organization, and Working Relationships with Civilian Merchant Mariners"), existing problem areas, and the ship discharge and lighter usage plans. Further, it establishes communications procedures, safety and security considerations (see Appendix J, "Security of Offload Anchorage or Beach Areas" and Appendix L, "Safety Considerations in Joint Logistics Over-the-Shore Operations"), working hours and/or shift changes, scheduled times for daily meetings, and other matters that will assist or hinder the expeditious and efficient discharge of cargo. Hindrances may be in the form of unforeseen conditions such as degraded or inoperative support equipment, unexpected priority cargo, or oversized and/or heavy lifts not noted on advanced stow plans or manifests.

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CHAPTER VI
SHIP DISCHARGE OPERATIONS

"Without supplies neither a general nor a soldier is good for anything."

Clearchus of Sparta
(speech to the Greek army), 401 BC

1. Overview

Cargo offloading is an essential element of the strategic sealift mission. Cargo offloading of strategic sealift ships may be conducted by Navy and/or Army forces augmented by civilian ship crews and select Marine Corps support personnel. **Subject to the requirements of the appropriate JFC, any of the Service components may be directed to provide forces and equipment to augment the other Service component for JLOTS operations.** The Navy has the primary responsibility for providing forces and equipment and conducting strategic sealift cargo discharge operations incident to amphibious operations and MPF deployments. The Army has primary responsibility for providing forces and equipment and conducting strategic vessel discharge operations incident to base, garrison, or theater development operations. Through its Army component, SDDC, USTRANSCOM provides the SPM for all common-user seaports worldwide. When necessary in areas where SDDC does not maintain a manned presence, a port management cell will be established to direct water terminal (i.e., fixed, unimproved facility, and/or bare beach) operations including the work loading of the Port Operator based on the combatant commanders priorities and guidance. Depending on the situation, the geographic combatant commanders may also request, in their command arrangement agreement (CAA) with USTRANSCOM, SDDC to operate some or all water terminals in their theaters. This chapter addresses those ship discharge operations pertaining to preparation, cargo type, and offloading system limitations.

2. Preparation and Responsibilities for Discharge

a. **Command Preparations Prior to Ship Arrival.** In conjunction with the staff and support forces, **the JLOTS commander must ensure that the unloading systems (lighterage, cranes, hatch kits, winches, auxiliary crane ships, and other requirements) and embarked vehicles for discharge are prepared for discharge operations**. Ship and cargo configuration and ship stow plans must be considered when developing unloading equipment and personnel requirements. The JLOTS commander's staff and designated units will accomplish the items listed in Figure VI-1 prior to the cargo ship's arrival.

b. **Command Preparations After Ship Arrival.** The JLOTS commander's designated debarkation officers must be well-trained with excellent working knowledge of LOTS operations and ship discharge procedures. Debarkation officers are provided aboard each working cargo vessel to effect efficient and coordinated discharge operations. In order to perform their duties, **they must necessarily have control over all military organizations operating aboard or on platforms (i.e., RRDFs) moored to the ships**. Included in the organizations mentioned below are the SLCP, hatch crews and/or teams, crane crews (on some ships), RRDF crews, and



Figure VI-1. Joint Logistics Over-the-Shore Commander's Staff and Designated Units' Responsibilities

augmentation personnel that are assigned to assist in ship unloading. For better control and coordination of the discharge operations aboard the cargo ship, the debarkation officer will accomplish the tasks listed in Figure VI-2, on arrival of the cargo vessels in the anchorage areas. Appendix A, "Planning Factors," Figure A-2 provides representative preparation times by ship types and cargo unloading systems.

c. **Lighterage. Lighterage for the offload of strategic sealift ships consists of LSVs, landing craft, amphibians, and CFs.** The availability of air cushioned and amphibious lighterage is dependent on the scenario, postamphibious operation commitments, and the direction of the JFC. Therefore, all lighterage belonging to the ATF or MPF may not be available for general offloading of strategic sealift ships. Army lighterage assets may be substituted if Navy lighterage is unavailable. The operational characteristics of various lighters are discussed in Chapter VII, "Lighterage Operations." Figure VI-3 displays types of lighterage that can be expected to be assigned to specific types of ships for cargo discharge.

(1) **CFs.** Ferries will be constructed in a ratio of powered to nonpowered sections based on weather conditions and load requirements. The minimum size ferry is one powered section with one nonpowered beach end.



Figure VI-2. Debarkation Officer Responsibilities

(2) **Landing Craft.** LCM-8s will be used primarily to transport palletized breakbulk cargo, personnel, and heavy single lifts, such as tracked vehicles. LCUs and other lighterage will be prepared and used as available, commensurate with the type of cargo to be offloaded.

d. **Ship Discharge Plan.** To effectively execute the discharge of ships delivering cargo to the operational area, **the JLOTS commander must ensure that discharge plans are developed, coordinated, and followed**. The elements of a discharge plan will vary with different types of

LIGHTERAGE UTILITY FOR DIFFERENT TYPES OF SHIPS	
SHIP TYPE	**LIGHTERAGE**
BREAKBULK	LCU, LCM-8
CONTAINERSHIP	CAUSEWAY FERRY, LCU[1/], LSV
RO/RO	CAUSEWAY FERRY, LCU, LCM-8[2/], ARMY LSV
LASH	CRAFT FOR BARGE TOWING[3/]
SEABEE	CRAFT FOR BARGE TOWING[3/]
1/ For containers, LCUs 1600 and 2000s can be off-loaded at the ELCAS; the LSV can only be off-loaded at a causeway pier. 2/ Army rhino horn-equipped LCM-8s only. 3/ LASH and SEABEE barges can only be off-loaded by ELCAS or shoreside cranes.	

Figure VI-3. Lighterage Utility for Different Types of Ships

vessels that are to be unloaded. Essential elements of any discharge plan will include the items shown in Figure VI-4.

e. **Equipment Availability. Material and equipment aboard most strategic sealift ships are limited to what is normally provided aboard merchant ships for commercial maritime operations.** Such ships are generally equipped to meet normal pierside offload requirements. However, strategic sealift ships originating from commercial sources most likely will not be equipped to conduct prolonged JLOTS operations. The offload preparation element must be prepared to provide cargo discharge support equipment necessary for the expedient and safe offload operations. Such equipment augmentation is available from pre-positioned war reserve stocks as explained in NWP 3-02.21, *MSC Support of Amphibious Operations*. However, this program may not be sufficient to extend to all ships involved in general offload operations.

f. **Personnel. Navy cargo handling force (NCHF) personnel, Army terminal service stevedores, or civilian mariners (in the case of the T-ACS) will make the preparations for the discharge of cargo from strategic sealift ships, including topping or spotting booms, opening hatches, removing shoring or dunnage, and other preparations.** The supported unit (such as US Army or Marine Corps forces) will provide additional personnel as necessary for loading or unloading ships and in the preparation thereof. A ship arrival meeting of ship's crew, SDDC's management cell representative, NCHF, and/or terminal service operations representatives will determine sequence for equipment positioning and individual Service responsibilities.

g. **Movement of Personnel.** Within the beach area, the movement of personnel must be controlled to ensure noninterference with offload operations, the safety of transients, and security considerations. **The JLOTS commander will establish a plan for movement and control of personnel within the immediate offload area and between the beach and the offshore discharge sites.** These areas should be considered controlled areas and only authorized personnel should be allowed in them. The transportation of passengers (such as hatch crews and/or teams,



Figure VI-4. Discharge Plan Essential Elements

shipboard personnel, military authorities, reliefs, rations, working parties and their small items of equipment [e.g., slings, tool kits, battery chargers]) should be included in such a plan.

3. Containership Discharge

Discharge of containerships, both self-sustaining and non-self-sustaining ships, will be conducted as an integral part of JLOTS. Container unloading order is provided by the ship unless specific cargo is needed ashore. During ship discharge planning, the debarkation officer should calculate the "long hold" to get an estimate of the length of time that will be required to unload the containership. The "long hold" of a ship is that hold that will require the most time to unload. Characteristics of various ship classes are in Appendix C, "Ship Characteristics."

a. **Self-Sustaining Ship.** The numbers of self-sustaining containerships are diminishing. Most are a combination of breakbulk containerships and RO/RO containerships that have limited capacity. These ships can discharge directly to lighterage for further transfer ashore. Adequate

spreader bars (if appropriate), steadying lines, and cargo handlers are necessary to lift and control containers during discharge.

b. **Auxiliary Crane Ship Operation.** Logistic support for military operations requires offloading US merchant ships in areas where no ports exist or where existing port facilities are inadequate. The T-ACS alleviates this dependence on port facilities and allows increased use of the merchant marine to support military logistics operations.

(1) **Preparations.** On arrival in the operations area, the T-ACS master and onscene MSC representative should establish communications with the JLOTS commander to obtain pertinent instructions and anchorage assignment. Information on expected containerships and their cargo should also be requested. Preparations can then be made accordingly.

(2) **Anchoring.** The T-ACS high holding power, balanced fluke, port anchor should be used in the assigned anchorage where containerships and lighters will be mooring alongside. In this mode, the nest will swing to the T-ACS anchor. No other anchors will be used except in an emergency. In deteriorating sea conditions, mooring of T-ACS may be by a two-point mooring system, other than use of the T-ACS stern anchor to provide a continuous lee for lighterage.

(3) **Self-unloading.** The T-ACS has the capability to carry 20- and 40-foot cargo containers as well as outsized cargo and vehicles in flatracks. Containers may be offloaded by the T-ACS cranes using the 20- or 40-foot spreader bars. Outside support includes the NCHF, lighterage crews, cargo transfer and port operations cargo unit personnel. Outsized cargo and vehicles will require slings. Standard slings have been provided for the T-ACS use. Cargo that requires special slings should come to the T-ACS with these special slings. Self-offload operations will be conducted under the direction of the JLOTS commander to ensure that facilities are available to receive lighterage and handle cargo. When the T-ACS cargo has been offloaded, hatch covers should be replaced in preparation for containership cargo offload.

(4) **Containership Mooring.** Preparation and scheduling are important factors for mooring the containership alongside the T-ACS. It is also important to establish early communication with the containership so that information may be exchanged. To assist in mooring containerships to T-ACS, MSC may provide a mooring master experienced in offshore alongside mooring. However, each ship master remains responsible for the safety of his or her own ship, its crew, and cargo. Each T-ACS is outfitted with fenders and mooring lines to accommodate alongside mooring with non-self-sustaining containerships (NSSCSs) and lighters. Advance information on the containership and its container load will allow proper positioning alongside and placement of mooring lines and fenders. Depending on operating area conditions, the T-ACS and the containership can complete the mooring by one of two methods: either alongside with the T-ACS at anchor, or with both ships underway. The cargo handling officer is responsible for coordinating with the T-ACS vessel master and/or mooring master to ensure the mooring plan supports the ship discharge plan. The two primary methods of mooring are discussed in the appropriate T-ACS Class Mission Operations Handbooks. Factors that could influence the decision include.

(a) Sea state.

(b) Weather conditions.

(c) Current set and drift.

(d) Availability of tugs to assist in mooring the two ships together.

(e) Maneuvering room or lack thereof.

(f) Experience of ship handlers.

(5) **Container Cargo Transfer Operation.** The primary function of the T-ACS is to provide crane service to move containers from the containership to the lighterage. To assist in cargo transfer operations, the T-ACS provides facilities for a cargo control office to manage transfer operations. The cargo discharge personnel for the containership and all personnel required on the lighters will be supplied by JLOTS units. The relationship between the cargo handling force and the containership and T-ACS officers and crews is shown in Figure VI-5. Factors affecting these operations include the following.

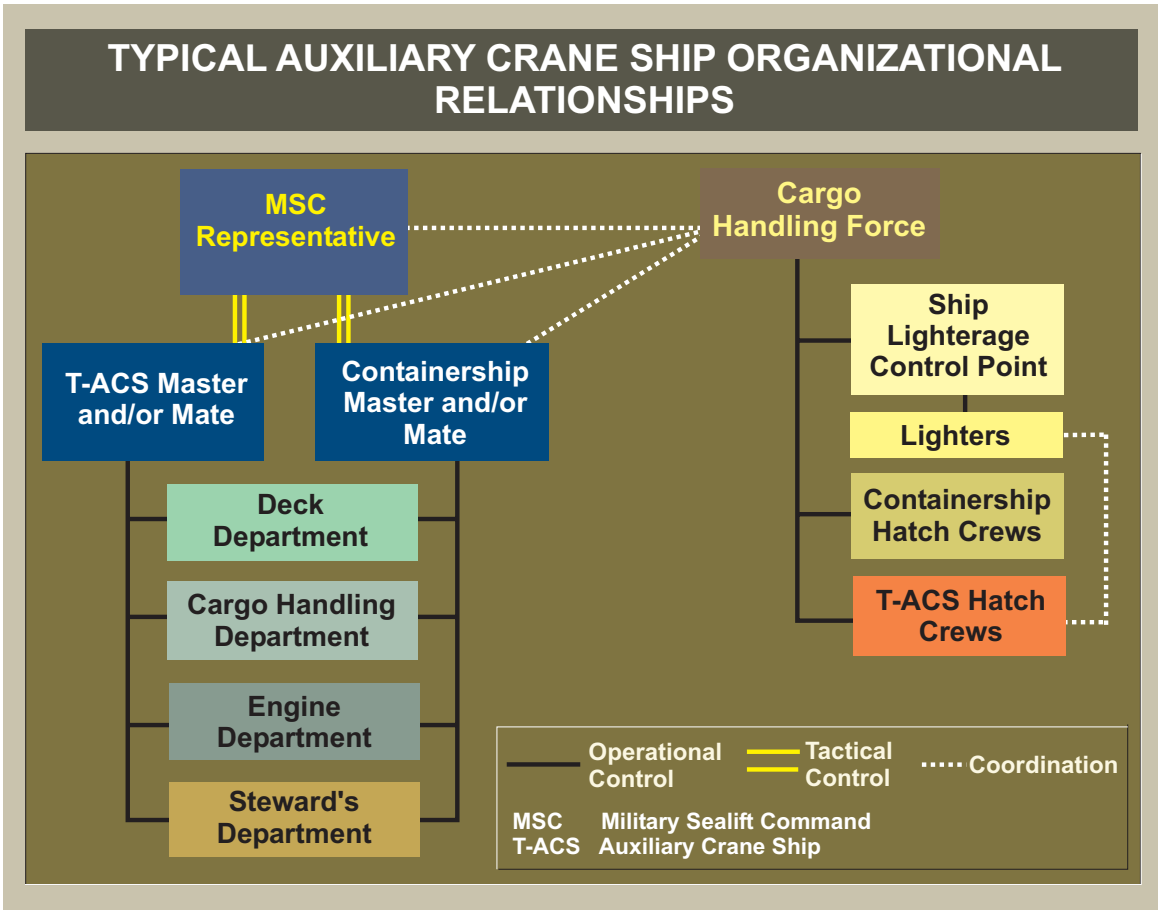


Figure VI-5. Typical Auxiliary Crane Ship Organizational Relationships

(a) Cranes should be manned and cargo teams stationed, as required, to maintain maximum container throughput. The T-ACS crew is responsible for rotating crane pedestals and attaching power swivels. Some T-ACS have three sets of twin cranes, and because of the various configurations of the containerships, cranes may not be employed at the same time. In planning JLOTS, containerships should be positioned to achieve best crane utilization. Night operations will normally be conducted in white light.

(b) Lighters will be called alongside by the JLOTS commander's representative at the SLCP. The T-ACS crew must be alert to lighterage movements and be prepared to pass sea painters or provide other assistance to the lighters.

(c) When the containers within reach of the crane have been offloaded, the containership will be warped to reach the remaining containers. With larger containerships, the containerships may have to be relocated several times. When feasible, the first position of the containership should be as far forward as possible; then natural forces will assist in warping aft as opposed to pulling the containership forward against wind or current. When the containership has been moved forward or aft and secured, offload operations may resume.

(d) T-ACS container discharge operations are affected by windward sea conditions and can be terminated by the discretion of the cargo handling force, through the JLOTS commander representative and MSC, while the ship's master has final determination, generally beyond 13 knots. T-ACS container unloading operations are also affected by rolling while at anchor. Ocean swells can create a five degree ship roll that may stop cargo operations due to uncontrollable pendulation of containers. However, termination of cargo operation on the ship is at the discretion of the cargo handling force, through the JLOTS commander's representative and MSC, while the ship's master has final determination. If this occurs, the use of tugs to turn the vessels into prevailing seas to allow continued container transfer is an option that should be considered by the debarkation officer and the JLOTS commander. Tugs can also be used to turn the ship to create a lee for lighters, however at the discretion of the ship's master.

(e) Upon completion of cargo operations and departure of the containership, the condition of the side rigging and fenders should be determined. If necessary, repairs should be made and preparations completed to receive the next containership.

(6) **Operation and Responsibility List.** A generalized function and responsibility list is shown in the T-ACS Class Mission Operations Handbooks.

4. Roll-On/Roll-Off Discharge

a. **Discharge Operations. RO/RO ships are the preferred mode of transporting tracked or wheeled combat equipment to an operational area.** They have the distinct advantage of a fast turnaround (load and offload) when equipment can be driven on and off the ships. To take advantage of their inherent ramp discharge capability, the Army and the Navy have developed an RRDF to provide a means of placing vehicles aboard lighters. The RRDF is discussed in Chapter IV, "Joint Logistics Over-the-Shore Systems, Facility Installations and Preparations."

The relationships between the debarkation officer, MSC representative, and RO/RO vessel master and crew are shown in Figure VI-6.

b. **Vehicle Discharge.** Under favorable weather conditions, vehicles carried aboard RO/ROs can be driven off the ramp directly onto the RRDF and then onto CFs, LCUs, and LSVs for transit ashore. However, if the sea conditions preclude the safe working limits of the RRDF, vehicles may be lifted onto CFs, LCUs, and LSVs by ship cranes or by T-ACS and then driven off at the beach. Provision for vehicle drivers will be designated in the OPORD.

c. **Navy RRDF.** The RRDF requires a typical crew of 19 to assemble and a crew of 12 to operate and maintain. Continuous 24-hours a day operation requires a crew of 24 personnel to operate and maintain.

d. **Army RRDF.** The Army RRDF is manned to operate at continuous 24-hour days with 16 enlisted personnel. The crew is capable of emplacing, operating, retrieving, and maintaining the platform. Assembly from the modular ISOPAK configuration requires augmentation from a terminal service company.

e. **Self-Sustaining Ship.** Self-sustaining RO/ROs can discharge military vehicles (e.g., tanks, recovery vehicles, trucks, tractor-trailers, and forklifts) over their own ramps, over the RRDF, and onto lighterage for transit ashore. Planners need to know that RO/RO ramps require

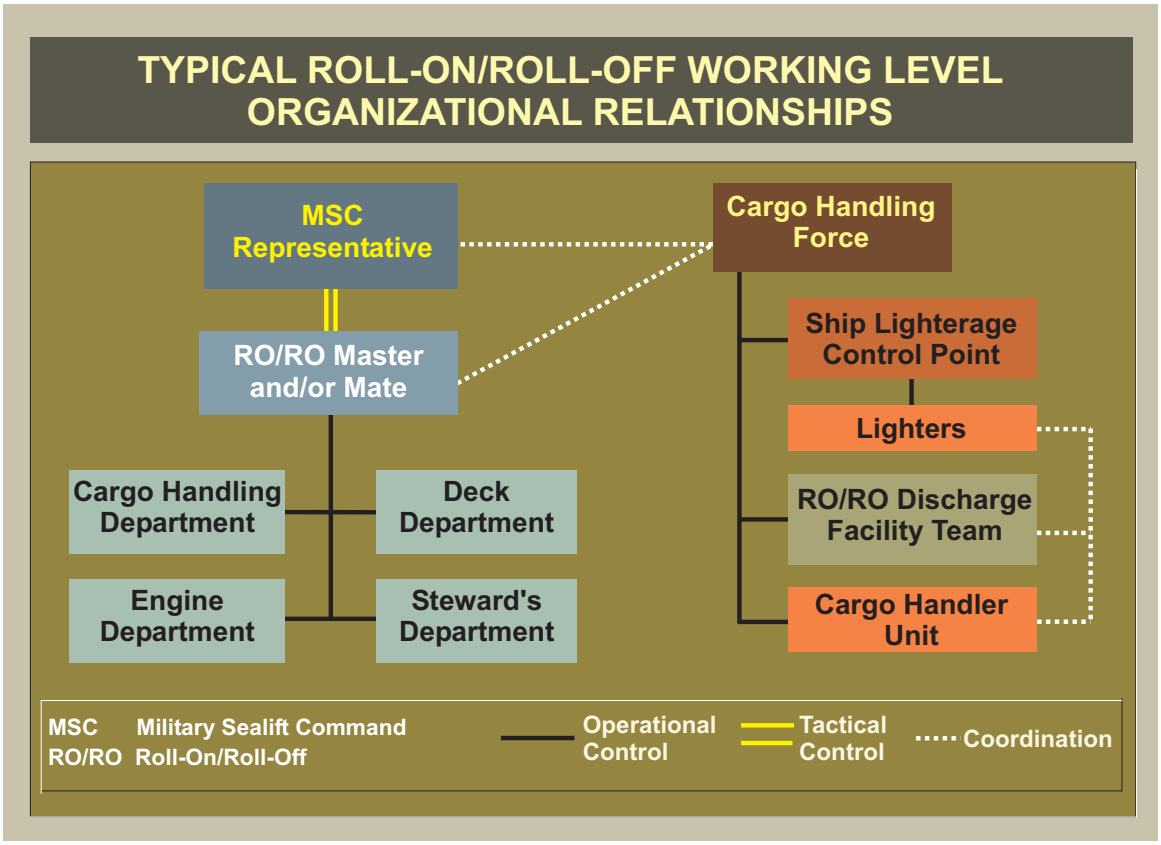


Figure VI-6. Typical Roll-On/Roll-Off Working Level Organizational Relationships

certification for offshore transfer operation. MSC should ensure that certification of ramps is accomplished prior to designating RO/RO vessels for JLOTS offshore operations.

5. Breakbulk Discharge

a. **Breakbulk discharge operations involve the offloading of a multitude of nonhomogeneous cargoes such as pallets, bags, bales, cartons, crates, cases, barrels, or drums.** Breakbulk vessels are used most effectively for transporting pallets, heavy lifts, and outsized cargo.

b. General cargo or breakbulk ships, with multiple hatches and holds fitted with booms or cranes for their own self-support of over-the-side cargo loading and discharging, are normally associated with these discharge operations. The ships are also able to accommodate limited heavy lifts, vehicles, bulk cargoes, refrigerated commodities, and containers. However other ships, such as NSSCSs with breakbulk cargo stowed on installed flatracks, or RO/RO ships with breakbulk cargo, may require the offload assistance of a floating crane or T-ACS.

c. Breakbulk cargo is normally discharged from the ship's holds, using the ship's gear, directly over the side into alongside lighterage. The ship's cargo discharge gear is usually operated by Navy or Army cargo handlers. In the case of non-self-sustaining ships, cranes from other sources are used to augment their discharge operations. Lighterage is shuttled between the ships and the shore until the ships are offloaded.

d. One of the commodities most frequently shipped breakbulk is ammunition. While the military today is using increasing levels of containerization, some Class V materials still may require breakbulk operations. Class V materials often involve a variety of handling requirements for items as variable as projectile skids and missiles, requiring the use of various ammunition-certified and/or approved slings and forklifts that cargo handling personnel will need to provide.

6. Barge Ships

Two types of barge ship systems are currently in operation: the LASH and the SEABEE. These ships are unique in ship discharge operations because they carry the largest of unitized cargo and are self-sustaining. These ships are typically used in JLOTS operations for deploying lighters and heavy outsized cargo to the operational area. Protected waterways usually are required for barge handling and towing services; furthermore, extensive barge-marshalling areas are required within protected waters. The barges themselves are not self-sustaining and will require towing and crane services for positioning and discharging their contents.

a. **LASH.** The LASH is a single-decked vessel with large removable hatches, wing tank arrangements, and a clear access to the stern. The LASH has a barge gantry crane for cargo handling with capacities from 446 to 455 long tons (LTs). The function of the barge gantry crane is to convey lighterage from the stowed location aboard the ship to the stern region and to lower the lighterage into the water. The MARAD RRF vessels Cape Farewell and Cape Flattery can

carry 85 LASH barges. Cape Florida and Cape Fear capacity is 73 LASH barges. All MARAD RRF vessels are also equipped with a container gantry crane for the handling of onboard complement of twenty-foot equivalent units (TEUs) containers. The container crane lift capacity is 30 LTs. Note that the container cranes are only capable to offload pierside due to the designed maximum static list angle for crane operation of 3 degrees. The MARAD RRF LASH vessels are able to stow

(1) Cape Farewell and Cape Flattery (C-9):

(a) Ammo only: 1,465 TEUs.

(b) Ammo/non-ammo mix: 1,564 TEUs.

(c) Non-ammo: 1,600 TEUs.

(2) Cape Florida (C-8):

(a) Ammo only: 1,231 TEUs.

(b) Ammo/non-ammo mix: 1,330 TEUs.

(c) Non-ammo: 1,366 TEUs.

Note: Each TEU ammo container has a maximum weight of 16.5 tons.

(3) The LASH is also capable of deploying all components of the ELCAS system. The cantilever lifting frame (only installed on Cape Farewell) is required to enable the barge gantry crane to lift causeway sections. The cantilever lifting frame capacity is 150 tons.

b. **SEABEE.** The SEABEE is arranged much differently from the LASH in that it has three decks on which the cargo barges or lighters are stowed. Barges are brought to each deck level by a stern elevator and are moved forward on the decks by two transporters, one port and one starboard. Two barges can be loaded or offloaded concurrently in a cycle of about 40 minutes. SEABEE ships are outfitted with a complement of 24 barges. The capacity of the elevator is 2,000 LTs. The SEABEE ship is the preferred ship to transport LCMs, LCU-1600s, small tugs, and heavy outsized equipment. The vessel also has the capacity to fully load the Navy's ELCAS (M) system, move up to five LCACs, or the lift and stow up 6 to 8 US Coast Guard 110' patrol boats.

c. **LASH or SEABEE Barges.** The LASH barge, as shown in Figure VI-7, performs the cargo transport function and can be carried by any LASH ship. The hold of the lighter is an unobstructed rectangular space completely free of pillars, web frames, and protruding brackets. Virtually all LASH barges are designed for general purpose dry cargo. The SEABEE barges are dimensionally larger than the LASH counterpart, yielding more than twice the deadweight and bale cubic capacity for cargo (See Figures VI-8 and VI-9).

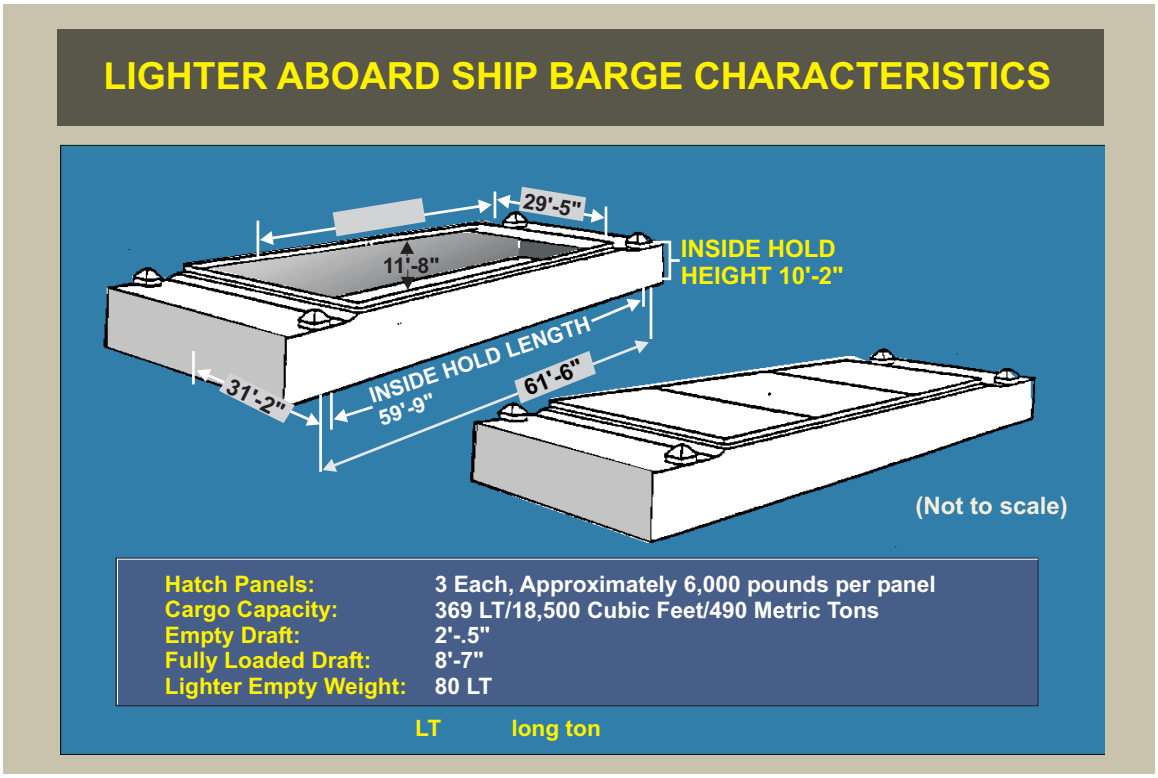


Figure VI-7. Lighter Aboard Ship Barge Characteristics

d. **Barge Ship Operations.** On arrival in the JLOTS area, the barge ship drops its anchor in a river, bay, semisheltered harbor, or ties up to a pier. Upon discharge, barges are towed to a marshalling area by lighterage assigned by the JLCC and then offloaded. Once offload is complete, they may be towed back to the ship for reembarkation.

(1) When protected waterways are not available, offshore discharge of barge carriers can be conducted in seas up to sea state 2+. This is a difficult task requiring well trained tug crews. The ship requires a minimum 45 feet of water astern to discharge the barges; however the barges may be towed to a cove or pushed up a river or harbor for discharge. Fully loaded LASH and SEABEE barges draw 8.6 feet and 10.6 feet, respectively. Because of these drafts, barges cannot be beached for discharge operations, but they may be discharged by crane alongside an ELCAS or at a fixed-pier.

(2) The SEABEE ship may carry tugs, stacked causeway sections, LCUs, LCACs, and other watercraft or heavy lift equipment to better support JLOTS operations. Addition of these items will offset the numbers of barges carried.

(3) Discharge from a LASH ship in a seaway is done while at anchor. The minimum anchoring depth for LASH is variable depending on many factors; 50 feet is a good planning factor. LASH ships have swell mechanisms on the lighter cranes that compensate for wave action (the relative vertical motion between the lighter lift frame and the ship). However, as wave heights exceed 6 feet, the potential for damage to the ship and lighter increases rapidly.

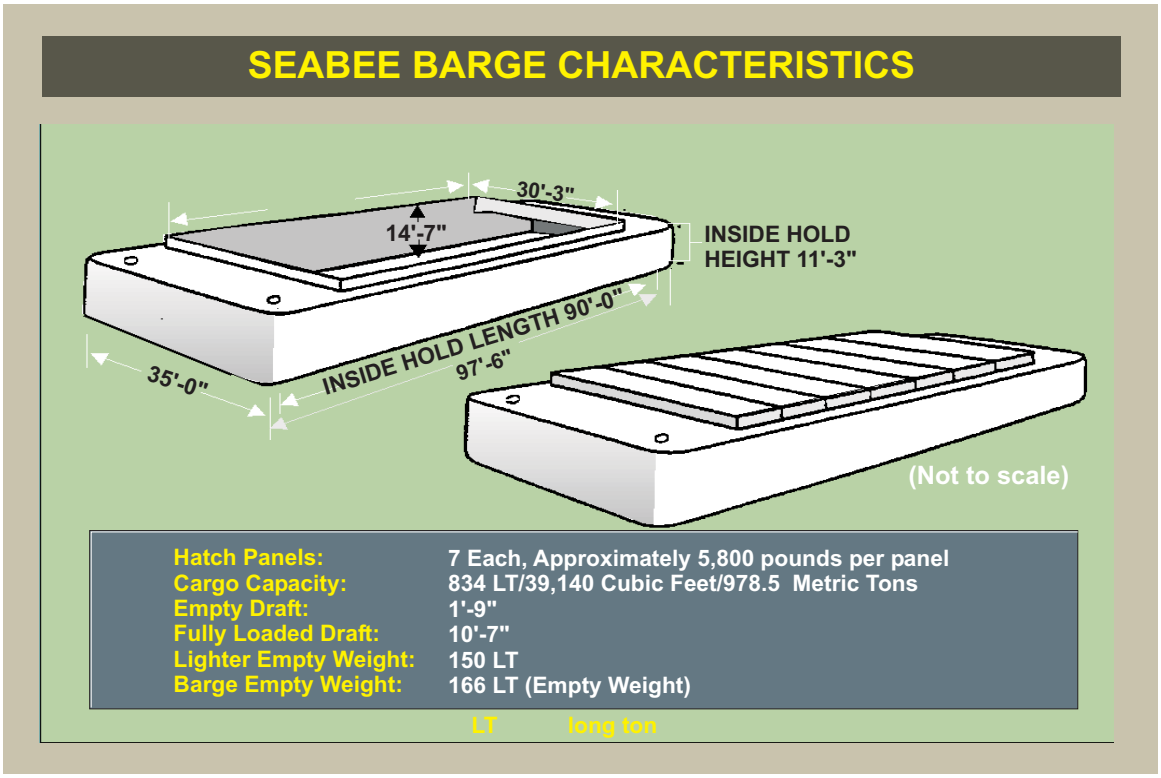


Figure VI-8. SEABEE Barge Characteristics

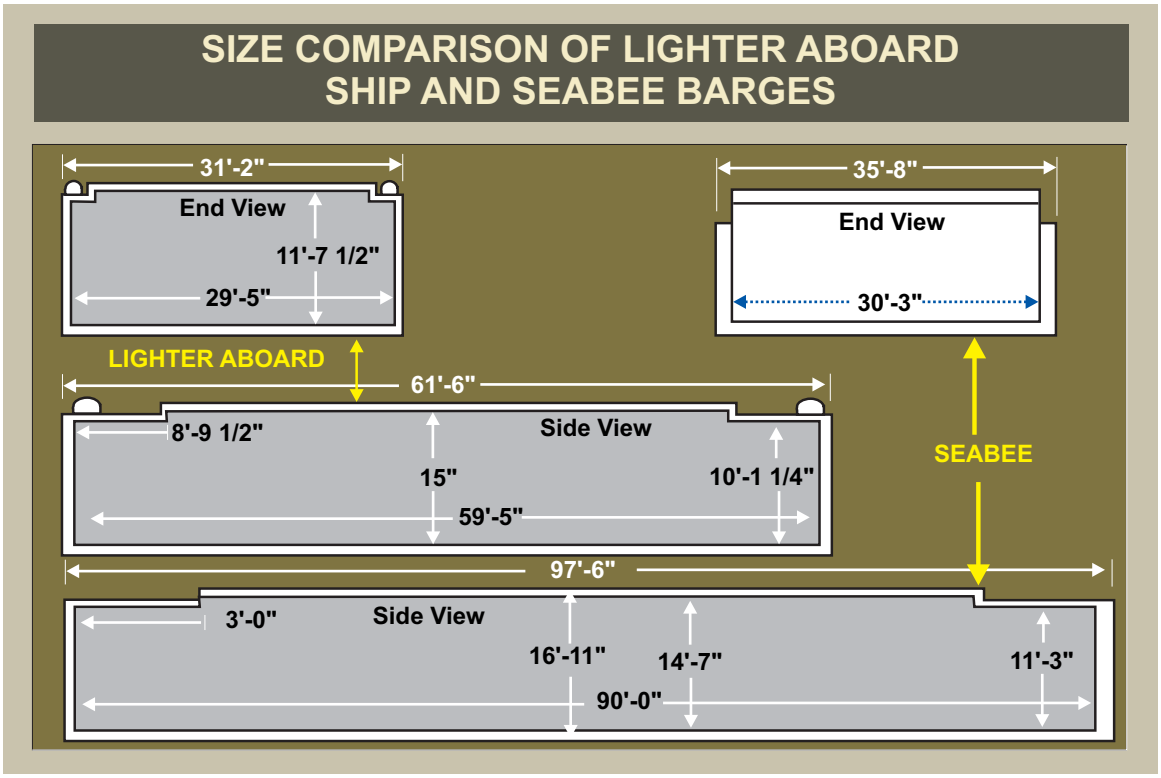


Figure VI-9. Size Comparison of Lighter Aboard Ship and SEABEE Barges

(4) The SEABEE should load or discharge barges and lighterage in protected or calm water (sea state 0-2) because the barge elevator cannot be subjected to motion-induced stresses. Barges can be loaded in up to 5-foot waves in the elevator well and lighters can be loaded in up to 3-foot waves in the elevator well. Virtually no differences in barge handling, mooring, towing, loading, and discharging methods exist between LASH and SEABEE barges except for the SEABEE's larger size and method of offloading their barges. For these reasons, the following discussion is confined to LASH capabilities. The discharge operation for LASH barges will be limited by the ability of the tugs to handle barges or floating outsized cargo components under the prevailing sea conditions. The ship will steam from its anchorage and should provide a lee at the transom for barge discharge. A realistic planning rate of discharge of barges from the LASH ship is one barge every 25 minutes.

e. **Other Planning Considerations.** During planning for barge ship discharge operations, the following considerations must be coordinated with operating units.

(1) Tug operations to move barges from ship to barge marshalling areas and from barge marshalling areas to a discharge point.

(2) Barge marshalling areas for holding loaded barges awaiting vacant discharge berth and empty barges awaiting return to ship.

(3) Pierside discharge points at either developed or undeveloped facilities. Operators will allow sufficient space astern to allow tugs and barges to be worked. Dependent on whether it is a LASH or SEABEE barge, 100 or 200 feet of additional pier space is required.

f. **Empty Barges.** A prime planning challenge for barge ship operators is the speedy return of empty barges. There are a limited number of barges available in inventory. They must be returned as quickly as possible so that sufficient barges will be available for further loading at seaports of embarkation (SPOEs).

7. Semi-submersible Ship

A large amount of outsized military cargo has to be transported during a military contingency. This cargo could include tug boats, barges, landing craft, amphibious air cushioned lighters, floating cranes, single anchor leg mooring (SALM) systems, and others. Lifts could range from approximately 50 to 2,252 LTs. These types of cargoes can be quickly loaded and discharged using float-on/float-off (FLO/FLO) methods. **Currently there are three different commercial semi-submersible ship design types: open deck ships ("servant" type), combined product tanker and heavy lift ships ("sea swan" type), and dock ships ("dock express" type).**

a. **Characteristics of Semi-submersibles.** The flat-deck ships, such as the motor vessel Super Servant with a forward deckhouse and no stern deckhouse, are very capable semi-submersibles. These ships each have a 250-ton heavy-lift derrick that increases their flexibility. These ships range in length from 525 to 591 feet (with a 131-foot beam), with deck sizes from 51,668 square feet to 60,280

square feet. They are capable of lifting loads from 20,180 to 23,430 LTs. The maximum submerged draft of these ships approaches 72 feet; the ships' service speed is approximately 14 knots.

b. **Semi-submersible Operations.** During a FLO/FLO operation, the hull is submerged horizontally by flooding ballast tanks until the cargo becomes buoyant and is floated out, either under its own power or towed. Most semi-submersibles are capable of a four-point moor. Anchorages should be in sheltered waters with minimal currents because semi-submersible operations are normally calm-water evolutions. Environmental conditions exceeding sea state 1 or currents of more than 0.25 knots will normally prohibit semi-submersible loading or discharge operations. Each vessel type loaded aboard the semi-submersible will float as the semi-submersible submerges based on their individual drafts.

(1) To conduct safe semi-submersible operations, the supported forces will have to provide large numbers of line handlers, fenders, and safety equipment (depending on the type and numbers of cargo to be discharged). Tugs or pusher boats should be positioned to assist in the discharge and subsequent transit of FLO/FLO cargo to their ultimate delivery points.

(2) Semi-submersible ships are of great value to a JLOTS operation, not only because they are capable of safely delivering such huge outsized loads (no lifting required in most cases) but also because most semi-submersibles can carry liquid cargoes (water, bulk fuel) in some of their ballast tanks.

8. System Limitations

a. **JLOTS systems and subsystems are interdependent, weather-dependent, and should be interoperable between the Services.** It is important to note that any one JLOTS system or subsystem operating alone is not capable of satisfying or performing all functions associated with the offshore, in-stream discharge of equipment and supplies and the transshipment and offloading of cargo ashore. It is important to be aware that Navy and Army causeway/lighter systems are not always compatible. This should be considered prior to JLOTS execution. Through the JLOTS MOA between the Army and Navy a JLOTS Master Plan was developed to integrate near- and far-term solutions to JLOTS operations in heavy weather.

b. To constitute an effective operating system, JLOTS equipment must be designed and developed to function in the demanding environmental conditions that are prevalent worldwide. Currently, heavy weather conditions halt JLOTS operations because of the hazards to personnel and equipment. The most difficult operating situation is in heavy weather when wave height, length, and period along with accompanying ground swell are classified as greater than sea state 2. JLOTS operations cease or are severely limited in conditions above sea state 2 plus.

c. There are four primary areas of concern with the LOTS systems and the interfaces between these systems when influenced by a combination of ground swell and sea state 3 conditions.

(1) Severe pendulation of suspended crane loads, creating a dangerous condition for personnel and equipment.

(2) Dissimilar motion between the various vessels and watercraft used in a LOTS operation. The roll motion of sealift ships (influenced primarily by long period ground swell) and the motion lighters or causeway systems alongside (influenced by shorter period sea swell) creates a relative motion problem at their interface. RO/RO sealift ships' ramps are not designed to withstand the relative motion between the ramp and platform.

(3) Hazardous operating conditions (green water on deck) for causeway lighterage systems transiting from ship to shore, posing a danger to personnel and equipment.

(4) Hazardous surf zone operations stopping all beach discharge due to high surf.

d. JLOTS equipment is also limited in the ability to transfer outsized cargo. Such operations may be limited to a single discharge method or site. Specific systems or equipment limitations can be found in applicable TMs prepared by the cognizant Service or developer. These additional limitations applicable to specific ships should be addressed by the JLOTS planners.

CHAPTER VII
LIGHTERAGE OPERATIONS

"Supply and transport stand or fall together; history depends on both."

Winston Churchill
***The River War*, 1899**

1. Overview

This chapter addresses those aspects of JLOTS operations involving lighterage. Planning factor figures that will assist planners in developing reliable lighterage estimates are located in Appendix A, "Planning Factors."

2. Responsibilities

The JLOTS commander will designate responsibilities for control of lighterage in the JLOTS OPORD. Assignment of responsibilities will be heavily dependent on the type of units available (Army or Navy) to conduct discharge operations. Service unit capabilities are discussed in detail in Appendix M, "Unit Capabilities." The procedures for control of lighterage in JLOTS have been standardized through incorporation of both Army and Navy methods. The following terms are used to describe the lighterage control organization.

a. **Joint Lighterage Control Center.** The center operates under and reports to the JLOTS commander or designated representative. Personnel that will staff the JLCC must be identified very early in the planning phase so sufficient training can be accomplished. These personnel should come to the JLCC staff with Service LCC expertise in LOTS operations. **The Services' LCC personnel and equipment are integrated to form the JLCC.** During the planning phase of a JLOTS operation, personnel assigned to the JLCC must allocate watercraft as requested by the debarkation officers in support of lighter usage plans. **When the operation commences, the JLCC will be the key coordinating body for management and modification of lighter usage plans based on requests by the debarkation officer through the SLCP.** The JLCC must be physically located, ashore or afloat, in a position that affords the best visibility of the lighter operating area and does not interfere with shoreline transfer points or lighter transit lanes. A notional JLCC organizational structure is shown in Figure VII-1.

b. **Ship Lighterage Control Point.** Personnel manning the SLCP should have an excellent working knowledge of lighter cargo capacities, deck loading configurations, lighter communications capabilities, and operating speeds. Additionally, they should be knowledgeable of the cargo ships that will be used during operations and they should know how to optimally use assigned lighters at the ships discharge points.

c. **Beach Lighterage Control Point.** Personnel manning the BLCP should be very familiar with lighter discharge operations involving the use of floating causeway piers, elevated causeway piers, ADSs, and bare beach sites. Additionally, a working knowledge of beach clearance systems is beneficial. Collocation of the BCU commander with the BLCP is recommended when only

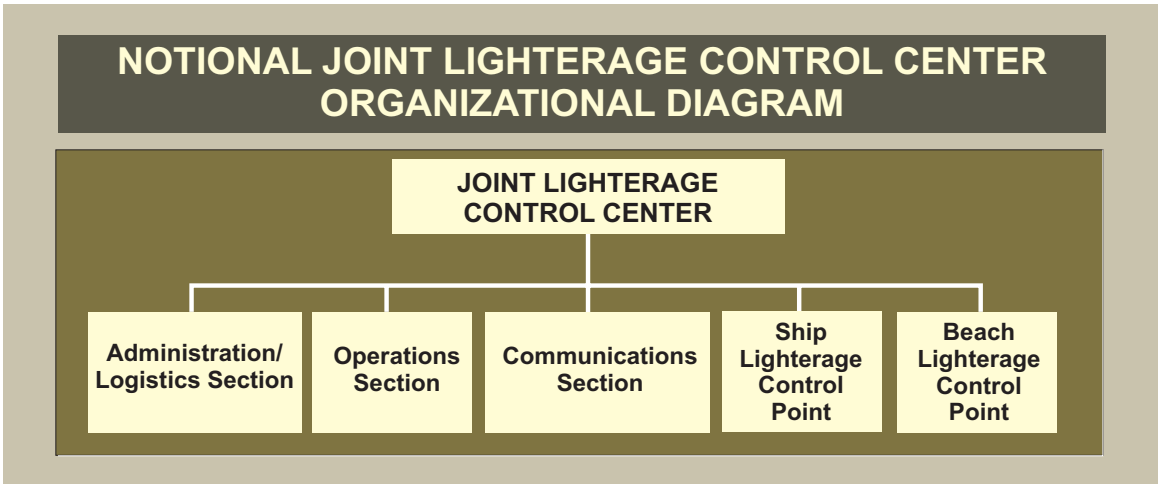


Figure VII-1. Notional Joint Lighterage Control Center Organizational Diagram

one BLCP is in operation. If two or more BLCPs are required, the BCU commander may locate centrally providing liaisons to each BLCP. These liaison personnel should have a working knowledge of beach transfer and clearance operations and an established communications net. They keep the BCU commander advised of types and condition of cargo being called forward by the BLCP and any specialized equipment required at the beach transfer facilities, such as jumper cables, tow bars, chains, and tool kits.

3. Lighter Control

Decentralized control of lighter movement is necessary for effective and efficient lighterage operations. For JLOTS operations, a JLCC is established. Once the JLCC is established, SLCPs and BLCPs are emplaced as necessary to control the actual ship-to-shore movement of lighters and cargo.

a. **Joint Lighterage Control Center.** The JLCC provides overall management and guidance throughout the JLOTS operation. This includes assignment of lighters to SLCPs, monitoring ship-to-shore movement of lighters, ensuring safe lighterage operations, resolving disputes, managing available craft, establishing lighter anchorage sites outside of the active operations area, coordinating lighterage waterborne medical evacuations, and controlling lighterage entry and exit from the operational area. When the operation commences, the JLCC will be the key coordinating body for lighter usage plans. Figure VII-2 contains a list of additional functions that the JLCC performs.

b. **Ship Lighterage Control Point.** The SLCP keeps track and controls the movement of lighters assigned to it by the JLCC and/or lighter usage plan. At the direction of the debarkation officer, it calls lighters from the queuing area to the correct cargo transfer station alongside the discharging vessel. Once the lighter is loaded and at the direction of the debarkation officer, the SLCP issues instructions for the loaded lighter to cast off and contact the appropriate BLCP. Additionally, the SLCP should monitor ship and lighter usage plans, maintains radio contact, and coordinates with the BLCPs and JLCC as required.

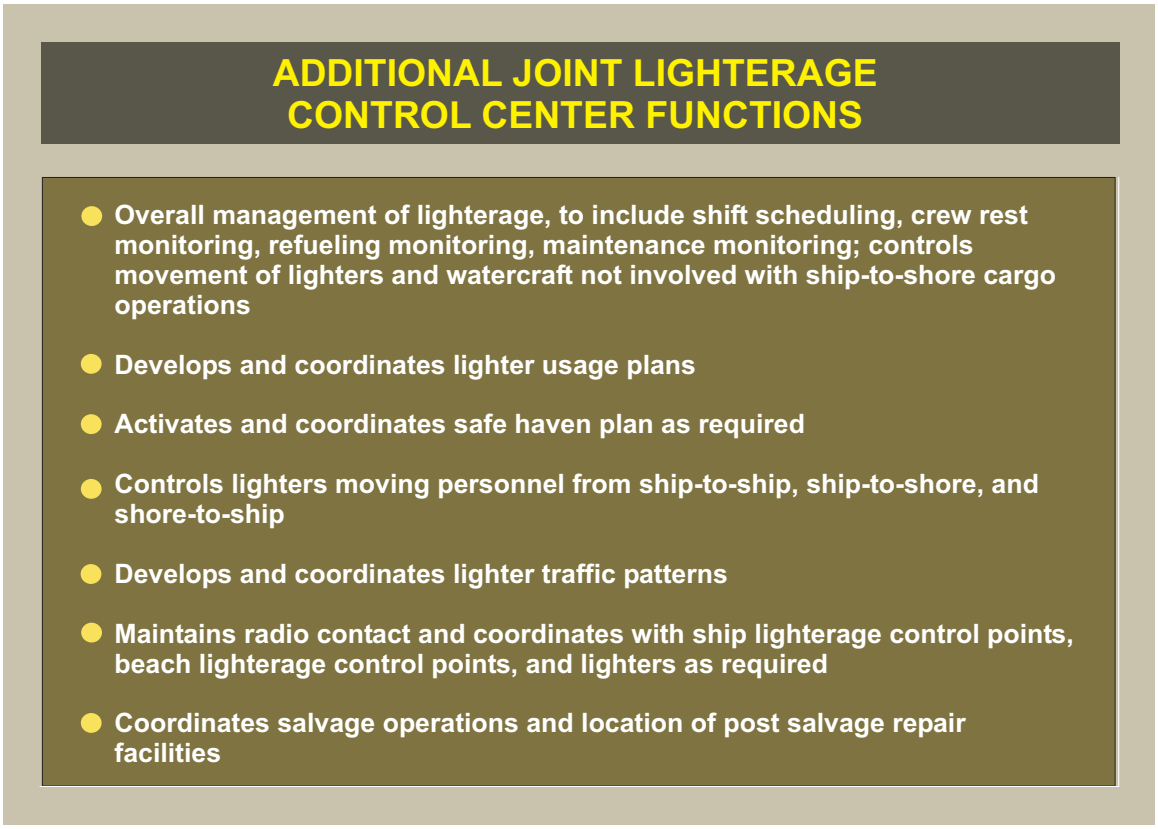


Figure VII-2. Additional Joint Lighterage Control Center Functions

c. **Beach Lighterage Control Point.** As control of a lighter is passed from the SLCP to the BLCP, the BLCP, in coordination with the BCU commander, is then responsible for directing lighters to correct beach transfer sites at the beach or to a queuing area to await for a correct beach transfer facility or bare beach site. The BLCP should obtain information from the lighter as to the quantity, type, and status of its cargo. This information is passed to the BCU so that adequate provisions can be made to receive and transfer any special or nonoperative cargo. Once the lighter has been called forward and unloaded, the BLCP issues instructions to cast off and report to the SLCP. The BLCP should maintain radio contact and coordinate with the SLCPs and JLCC as required.

d. **Lighter Responsibilities.** Well-trained lighter masters are essential to effective cargo throughput operations. During cargo operations, they must at all times maintain radio contact with the BLCPs and SLCPs and check in and check out when entering and leaving the operational area. Knowing the conditions of the cargo loaded onto their crafts is an essential factor for timely discharge at the beach. This information is provided to the BLCP so that arrangements can be made for any special equipment required to assist in cargo transfer once the lighters are moored. An additional responsibility of lighter masters is to keep the SLCP informed of administrative requirements such as refueling, crew rest, maintenance, and/or other administrative matters not covered by the lighter usage plan.

e. **Traffic Patterns.** Traffic patterns are established by the JLCC and included in the lighter usage plans to minimize the risk of collisions and allow an unhampered flow of lighter traffic. The two primary elements of traffic patterns are beach lanes and queuing circles. Beach lanes are lanes that lead to cargo transfer points on the beach. These lanes, other fairways, and hazards to navigation are marked by flags in the daytime and by lights at night. Queuing circles are holding patterns used by lighters waiting to move alongside the discharging vessel or waiting for an open beach transfer facility. The goal of lighter management is to keep lighters loading and unloading cargo and out of queuing circles.

4. Transition

Transition of lighterage assets from dedicated Service support (Navy or Army) to joint operations is largely scenario dependent. However, in a representative situation, the Navy or Marine Corps system would provide the initial commercial ship unloading capability and would deliver not only the follow-on supplies and equipment to the amphibious assault forces but also the necessary sustained support. Upon arrival of the Army forces, dual operations would be conducted until the Army is fully established and the JFC designates which Navy systems to begin to withdraw, if required, to support other operations. Control would then shift to the Army, using an agreed phased-transition procedure (see Figure VII-3).

5. Lighterage Maintenance

Maintenance and repair of lighterage will be conducted as described below.

a. **Navy Maintenance Support.** The Navy has the capability to establish a lighterage repair element — either afloat on the boat haven ship or ashore. This is true as long as a boat haven ship remains in the area. On departure of the boat haven ships, an afloat lighterage repair element would relocate ashore. A lighterage repair plan is promulgated for preventive maintenance of lighterage equipment. Lighterage maintenance considerations include the following.

(1) A self-sustaining capability to the maximum extent possible. Maintenance and support elements are capable of intermediate-level craft repair at designated lighterage support havens. Emergency lighterage equipment casualties will be corrected on station or at the designated haven.

(2) Reporting lighterage casualties immediately to the OCO, who will contact the beach party element to coordinate repairs. The lighterage repair officer will ensure that lighterage equipment repair support is accomplished in the most efficient and expeditious manner. The causeway pilots, boat coxswains, and the repair coordinator will be responsible for reporting to the JLCC and updating the status of the casualties.

b. **Army Lighterage Maintenance.** The maintenance concept for watercraft provides maximum self-sufficiency, supportability, and maintainability with a minimum use of personnel, parts, material, and equipment. Organizational and direct support maintenance for Army watercraft are normally performed by the crew and unit maintenance personnel. Backup direct

TRANSITION FUNCTIONS AND CONTROL FOR LOGISTICS OVER-THE-SHORE AND JOINT LOGISTICS OVER-THE-SHORE OPERATIONS

FUNCTIONS	RESPONSIBLE PERSON/ACTIVITY BY OPERATION TYPE				
	PHIBOP	MPF OPS	NAVY LOTS	JLOTS	ARMY LOTS
Commanding	CATF/CLF	CMPF/MPF MEB Commander	OTC	JLOTS Cmdr	Terminal Gp. Cdr.
In Charge of Off-loading	PCO	OCO	OCO	OCO	Terminal Bn. Cdr.
Ship Discharge	DCO	Debarkation Officer	Debarkation Officer	Debarkation Officer	Ship Plat. Ldr.
Lighterage Cntl (overall)	PCO	OCO	OCO	JLCC	LCC
Lighterage Cntl (at ship)	Combat Info Center/DCO	Debarkation Officer	LCO	SLCP	SLCP
Lighterage Cntl (At Beach)	BPT	BOG	BPT	BLCP	BLCP
Beach Clnc. & Marshalling Yd.	Shore Party	BOG/POG	Shore Party	BCU	BOG

Legend
BCU = beach clearance unit, BLCP = beach lighterage control point, BOG = beach operations group, BPT = beach party team, CATF = commander, amphibious task force, CIC = combat information center, CLF = commander, landing force, CMPF = commander, maritime pre-positioning force, DCO = debarkation control officer, JLCC = joint lighterage control center, JLOTS = joint logistics over-the-shore, LCC = lighterage control center, LCO = lighterage control officer, LOTS = logistics over-the-shore, MEB = Marine expeditionary brigade, MPF = maritime pre-positioning force, OCO = Off-loading Control Officer, OTC = officer in tactical command, PCO = Primary Control Officer, PHIBOP = amphibious operations, POG = port operations group, SLCP = ship lighterage control point

Figure VII-3. Transition Functions and Control for Logistics Over-the-Shore and Joint Logistics Over-the-Shore Operations

support and general support maintenance are performed by a floating craft maintenance company for all types of Army watercraft. Depot-level maintenance that exceeds the capability of Army maintenance units is principally performed under contract by civilian shipyards. Army maintenance units are deployable to support contingencies. Depot-level civilian contract maintenance may be obtained during contingency deployment through the DOD Logistics Civilian Augmentation Program.

c. **Single-Service Support.** Normally, boat maintenance will be Service-oriented; i.e., Navy lighterage will be repaired or maintained by the Navy. During phase-in or phase-out periods, when Service maintenance organizations are not in place, a single Service may be required to perform repair or maintenance for all craft.

6. Operational Limitations

The use of lighterage in support of the ship-to-shore movement of cargo is weather-dependent. As sea state increases or temperature decreases dramatically, lighterage productivity decreases. As discussed in Chapter VI, "Ship Discharge Operations," the ship-to-shore movement of cargo is currently limited by the capabilities of the discharge facilities to handle the cargo. Lighter and ship discharge operations begin to degrade as conditions enter the upper half of sea state 2 and significant wave heights reach 2.5 to 3.5 feet. The inherent risks of operating in sea state 3 are not worth the minimal productivity and possible equipment damage which could occur. Such damage could prevent timely resumption of operations as weather clears.

7. Lighterage Types and Operational Characteristics

The lighterage assets organic to naval LOTS include landing craft and CFs. The type of lighters will be dependent on the weather, sea state, surf conditions, beach gradient, and characteristics of the loading and discharge sites. Both landing craft and CFs have navigational lights and can operate under conditions of reduced visibility, although they will require vectoring from the ship control centers. Lighterage characteristics are contained in Appendix B, "Lighterage Characteristics."

a. **Landing Craft, Mechanized.** Navy LCM-8s are attached to ACUs and are deployed on the maritime pre-positioning squadrons. Army LCM-8s are assigned to transportation medium boat companies. LCMs are propelled by two main diesel engines driving twin screws. They are designed to transport breakbulk cargo, wheeled and tracked vehicles, and personnel and equipment from offshore ships through a surf zone and onto a beach where bow ramps are lowered and cargo is offloaded to a beach. LCMs are capable of operating on a 24-hour basis with two crews and are able to retract from the beach on their own power.

b. **Landing Craft, Utility (LCU-1600 Class).** Navy LCUs are attached to ACUs. LCUs are capable of transporting containers, breakbulk cargo, RO/RO cargo, outsized cargo, and personnel from offshore offload sites to beach discharge sites. They are self-sustaining lighterage capable of operating on extended missions based upon provisions and fuel capacity. LCUs are capable of beaching and retracting under their own power and are equipped with a stern anchor to assist in retracting. The 1600 Class LCU is a twin screw vessel powered by two diesel engines. Its pilot house and crew quarters are located on the starboard side, which allows the craft ramps on both the bow and stern to provide full drive-through capability. They are also capable of marrying to a causeway, RRDF, or to another LCU if they are fitted with a "rhino" horn.

c. **Landing Craft, Utility (LCU-2000 Class).** Army 2000 Class LCUs are assigned to transportation heavy boat companies and are used to move personnel, containers, vehicles, and other cargoes. They are self-sustaining and self-deliverable vessels that perform ship-to-shore and extended missions. LCUs are capable of beaching and retracting under their own power and are equipped with a stern anchor to assist in retracting. The 2000 Class LCU is a twin screw

vessel powered by diesel engines. The engine room and crew quarters are located in the aft section. Cargo must be loaded and discharged via the bow ramp or by crane.

d. **Landing Craft, Air Cushion.** The LCAC employs air cushion vehicle (ACV) technology with gas turbine propulsion. The LCAC delivers cargo from a seaward launch point at speeds in excess of 40 knots. The high speed over the beach craft can carry a 60-ton payload. LCACs can transport a wide variety of wheeled and tracked vehicles, weapons, personnel, and equipment. It has a fast turnaround for multiple missions. The craft is capable of transiting ashore across about 70 percent of the world's littorals and proceeding to a dry landing ashore. Appendix B, "Lighterage Characteristics," contains LCAC characteristics and a diagram (Figure B-3).

e. **Causeway Section, Powered, and Side Loadable Warping Tug.** The CSP and SLWT ferry causeways to and from offshore discharge positions. Each CSP is powered by two 360-degree rotatable WPAs that provide exceptional maneuverability and shallow draft. The CSPs can ferry the loaded causeway sections either directly through the surf zone to the beach or to the pierhead of the ELCAS. When a CSP is fitted with an A-frame at the bow, a deck winch, and other equipment, it becomes an SLWT. Both the CSP and SLWT are used extensively in JLOTS operations (see Figures IV-1 and IV-2). Other CSP and SLWT considerations include the following.

(1) The CSP has a crew of 6, with 12 personnel assigned for a 2-shift, 24-hour operation. The SLWT requires a crew of 8, with 16 personnel assigned for continuous 24-hour operation.

(2) The CSP can be used with other causeway sections to transport and offload initially required equipment, including vehicles such as track and wheeled vehicles, bulldozers, and associated beach gear. The CSP and SLWT can be used as lighters to transfer containers and follow-on equipment from ship to shore.

f. **Causeway Section, Nonpowered.** CSNPs can be carried on some types of military and commercial shipping. They may be used as barges, propelled by lighterage to the beach, or used as components of the RRDF or floating CWP. The versatility of these CSNPs makes them useful in many forms, limited usually only by weather (sea state 3).

g. **Causeway Ferry.** CFs are composed of CSPs and CSNPs joined together to form a barge ferry platform. Ferries transport pallets, vehicles, and containers to the shore and are configured for beaching. Ferries will be constructed in a ratio of powered or nonpowered sections as determined by the JLOTS lighter usage plan, based on weather conditions and load requirements. The minimum size ferry has one powered section with one beach end (CSP+1). The largest practical size has one powered section, two intermediate sections, and one beach end (CSP+3). A double-wide ferry configuration using Army modular causeway sections is another viable CF concept. Figure VII-4 provides additional information on ferry configurations.

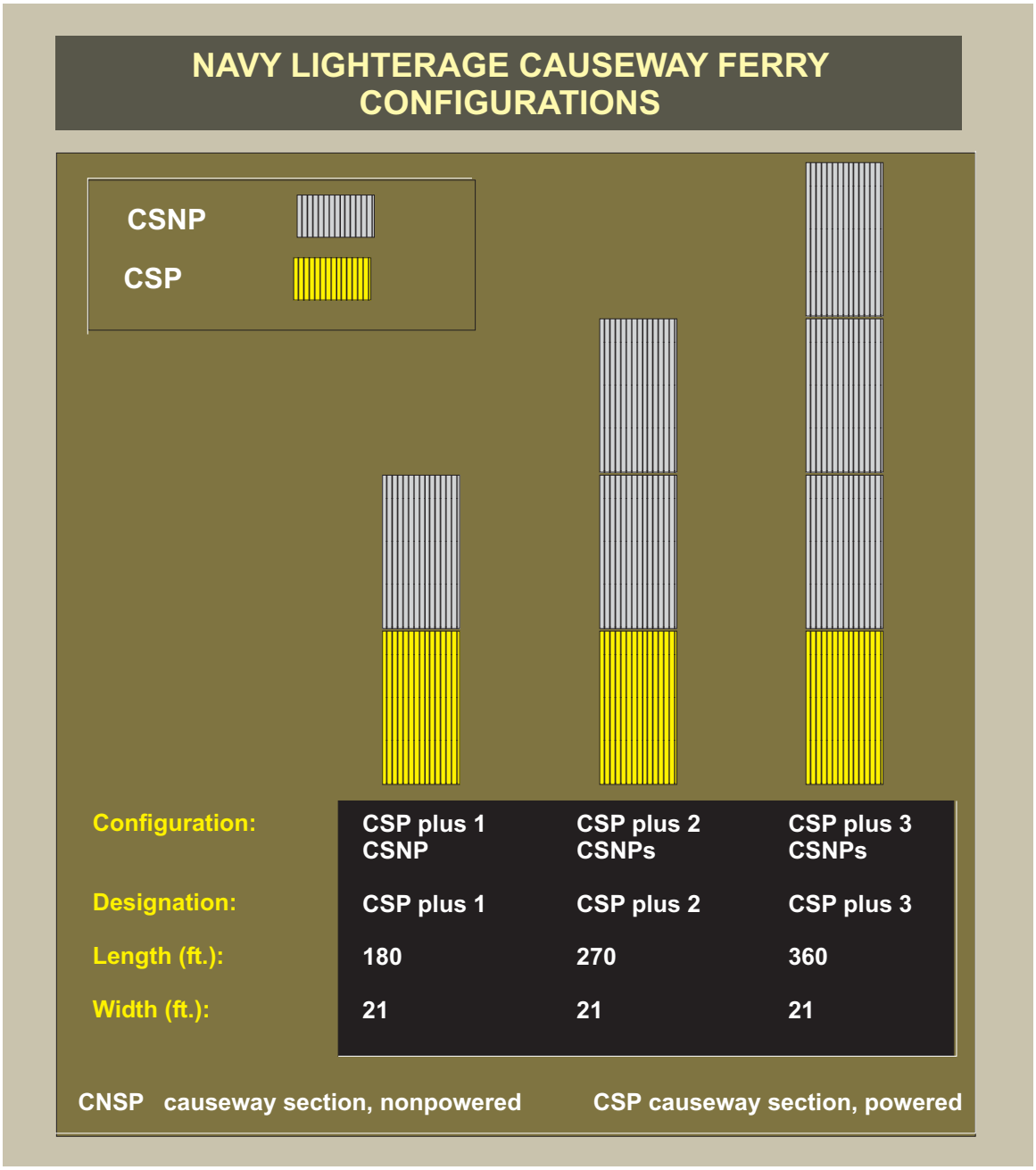


Figure VII-4. Navy Lighterage Causeway Ferry Configurations

h. **Lighter, Amphibious Resupply Cargo (LARC-V).** The LARC-V amphibian is mainly employed by the Navy in surf zone salvage as part of beach party teams or in ferrying personnel between the beach and the ships anchored offshore.

i. **Barges.** Army barges are available in a variety of sizes and functions, including deck and liquid versions. The three types of barges currently in the Army inventory are nonpropelled (See FM 55-50, *Army Water Transportation Operations*). Barges can be successfully used in ship-to-shore operations. These craft have a large cargo capacity and may be locally procured. One propulsion system, such as a tugboat or landing craft, can service several barges. However,

during adverse weather, the barge's reliance on an outside propulsion system makes stability difficult. Barges are operated by watercraft teams. Several barge and tugboat teams can be organized into a watercraft company with C2 provided by Table of Organization and Equipment (TOE) 55500, *Headquarters Units*.

j. **Logistics Support Vessel.** The LSV transports approximately 2,000 STs of dry cargo in coastal, harbor, and inland waterway missions. The craft possesses a beaching capability that will permit use in LOTS and JLOTS missions. In LOTS and JLOTS operations, beach gradient variations can limit LSV cargo carrying and beaching capabilities. The vessel is capable of transporting equipment, including tanks and engineer items. Its RO/RO design permits rapid discharge of mobile unit equipment. The craft is self-deployable to the objective area. The vessel is best utilized primarily for the loading of wheeled and tracked vehicles from RO/RO vessels, rather than transporting breakbulk cargo or containers from containerships.

8. Container Operations

Twenty- and forty-foot containers are more efficiently transported to the beach by double-wide and regular CFs. LCUs, LSVs, and LCACs are used to support container operations when additional lighters are required. The method of stowing containers aboard lighters is determined by the weather and swell conditions and by the method of discharge used on the beach. Lighter loading varies according to beach gradient, lighter weight limitations, and transfer facilities. Containers on landing craft (except LCUs) are normally transferred at the water's edge by RTCHs, rough terrain container cranes (RTCCs), and beyond the surf zone, by the ELCAS crane. Container operations using lighters are described below.

a. **Causeway Ferry Operations.** The Navy and Army CFs are excellent platforms for container transport. The CF effectiveness and capacity varies with the configurations previously described. Because of its ability to change configurations, the CF is flexible and adaptable to operational requirements, beach conditions, and theater offloading capability. CFs are usually the slowest watercraft option for shuttling containers from ship to shore. The operational capability of CFs can degrade significantly in sea state 2. They are incapable of operating effectively in sea state 3 and above. CFs operate in shallower water than most other lighters. When loading from a crane ship, two CFs can nest alongside and be loaded simultaneously reducing crane waiting time. Athwartship placement of containers is recommended for timely transfer by an ELCAS crane or RTCHs at the bare beach site.

b. **LCU and LSV Operations.** Containers can be stowed aboard LCUs and LSVs either athwartship or fore and aft. Containers may be double stacked aboard the deck of both LCUs and LSVs if the situation permits. Containers are transferred from LCUs by an ELCAS crane.

c. **LCM-8 Operations.** An LCM-8 can only stow a 20-foot container fore and aft. It is, therefore, restricted to unloading by the ELCAS crane.

9. Roll-On/Roll-Off Operations

Landing craft and CFs are used to transport vehicles ashore from offshore discharge positions. All lighterage can be loaded with vehicles by the lift-on method (e.g., by a ship's crane). However, only LSVs, 1600-class LCUs, 2000-class LCUs, Army convertible LCM-8s, and CFs can receive vehicles directly over a ramp from a RRDF. A 1600 class LCU marriage, however, is possible only when a seaward positioned causeway section with a "V" notch and a rhino horn have been attached to the platform. LCUs are loaded by placing their bow ramp onto the rhino horn of the RRDF sea-end causeway section. CFs are attached to the RO/RO platform via the use of flexor connectors. Vehicles are driven aboard in a manner to facilitate discharge by driving the vehicle forward. Normally, vehicles are backed aboard landing craft. Vehicles should be appropriately secured while in transit, including having brakes set. RO/RO operation considerations include the following.

a. **Landing Craft Operations.** On a bare beach, landing craft ground out and lower their ramps so RO/RO cargo can be driven or towed to the dry beach. Vehicles can also be lifted out by cranes at an ELCAS facility and driven or towed ashore. Additionally, only LSVs, 1600-Class LCUs, 2000-Class LCUs, and Army converted LCM-8s can marry to an appropriate section of the seaward end of a floating CWP to discharge RO/RO cargo ashore.

b. **Causeway Ferry Operations.** CFs are the most versatile of the lighterage capable of moving RO/RO cargo to the shore discharge points. Vehicles can be driven directly onto the beach. CFs should be beached as close to beach egress routes as possible to facilitate rapid clearing and lessen beach deterioration. Upon completion of vehicle unloading and retracting, as appropriate, bulldozers may be used to push the ferry seaward until all sections are afloat.

c. **RO/RO Throughput Capability.** The mean loading and unloading time and lighterage loads are shown in Appendix A, "Planning Factors."

d. **Lighterage Procedures for RO/RO Operations.** Where possible, RO/RO operations will be conducted. When lighterage is used, the procedures listed below are followed.

(1) Vehicles will be loaded with the front of the vehicle facing the bow for ease of drive off at the beach.

(2) When cargo on chassis is loaded onto lighterage, the tractor coupling will be kept toward the bow.

(3) When tracked vehicles are driven on or off lighterage, dunnage must be laid on the lighter's cargo deck, unless the vehicle has adequate rubber track pads.

(4) When driving vehicles off lighterage, ramp angle must be considered to determine if vehicles and/or trailers might be damaged.

10. Breakbulk Operations

All lighterage is capable of transporting most breakbulk cargoes to beach discharge sites. Although some outsized cargoes may not be compatible with smaller landing craft or amphibians, LCUs, air cushion watercraft, or causeway lighterage would be able to accommodate such cargo. Breakbulk cargo is loaded aboard lighterage by ship's cranes or T-ACS. The lighterage is prepared by providing dunnage, where appropriate, and cargo-securing equipment. Depending upon the sea state, cargo type, distance to the lighterage offload site, and the surf conditions, breakbulk cargo should be secured to some degree. Considerations for breakbulk operations follow.

a. **Causeway Ferry Operations.** CFs can be best employed in support of RO/RO and container offload evolutions. However, if used for breakbulk operations, dunnage should be available for use with nonpalletized cargoes, and lashing or cargo nets should be available for securing cargoes. Breakbulk cargo is offloaded to a bare beach or over a floating causeway by 4,000-, 6,000-, and 10,000-pound capacity rough terrain (RT) forklift trucks and at the ELCAS by cranes.

b. **Landing Craft Operations.** LCUs and LCM-8s are the most practical lighterage to use for the ship-to-shore transfer of breakbulk cargo. Cargo well sides provide some protection from weather and sea conditions; however, securing of cargo with cargo nets or lashings must be considered. Dunnage is used under nonpalletized loads to facilitate offload at the beach. Stacking of palletized cargo is dependent on weather, swell, and surf conditions. Breakbulk cargo is offloaded in the same manner as from CFs. Average bare beach offload times are shown in Appendix A, "Planning Factors."

c. **Breakbulk Cargo Loading Operations.** Breakbulk cargo will be loaded onto lighterage by crane or derrick. The load usually will not be secured by lashing. Securing, however, must be considered where lighterage is traveling long distances in rough weather or crossing a surf line. The procedures listed below are followed when loading breakbulk cargo onto lighterage.

(1) Palletized cargo is loaded directly onto the deck with little or no dunnage.

(2) Loose drums are placed on their sides in a fore and aft direction and stowed bilge to bilge. The drums are tiered in pyramid fashion and stowed no higher than three tiers.

(3) The coxswain will determine whether a load is suitable for the craft and may refuse to accept it if he or she believes it represents a danger to vessel or crew.

11. Barge Operations

Barge ships are self-sustaining with regard to offloading their complement of barges, but the barges themselves are not self-sustaining. Once offloaded from the barge ship, the barges are completely dependent on towing and discharge services, marshalling, maintenance, sheltering from the weather, and retracting. Usually, these operations are conducted in sheltered waters. Many facets of the two different barge type systems are addressed in Chapter VI, "Ship Discharge

Operations," including the characteristics of the barges concerned. This section covers operational considerations in the ship-to-shore movement of LASH and SEABEE barges.

a. **Barge Towing and Handling.** The availability of suitable towboats, tugs, or pusher craft is essential for an efficient barge operation. Desirable characteristics of tugs suited for barge handling include the items in Figure VII-5. Push-towing barges with pointed-bow tugs require considerable skill for proper barge maneuvering. In open waterways, barges are towed either singularly or in arrays. In confined waters or when approaching a cargo discharge site, it is necessary to re-rig the tow and push the barges for adequate maneuverability. Commercial and military tugs such as the Army's LT-800 and ST-900 classes, have demonstrated capabilities to handle barges. Landing craft will not be used to tow or push barges except in unusual situations when other assets are not available.

b. **Barge-Cargo Discharge Operations.** The various aspects of these operations are discussed below.



Figure VII-5. Desirable Characteristics of Tugs

(1) **Barge Hatch Covers.** LASH barges have two types of hatch covers, pontoon and folding; SEABEE hatches are covered by seven hatch panels. Pontoon hatch covers must be removed and stowed so as not to interfere with discharge operations. Folding hatch cover barges require more care in positioning because they represent an added obstruction to swinging the hook and load. They also present an obstruction to stevedore movement and field of vision.

(2) **Barge Preparation.** Preparations should include predetermining stowage location and handling of hatch covers. Forklifts, lights, Jacob's ladders, and bilge pumps to de-water barges should be provided, as appropriate, to facilitate load and offload operations.

(3) **Personnel.** Extra personnel may be required as signalmen since the crane operator may not be able to see into the hatch of the barge (barge height varies between 13 and 14 1/2 feet) and as tagline tenders, depending upon the degree of barge movement alongside the offload facility.

(4) **ELCAS Discharge.** The most capable barge discharge facility is the ELCAS. It has adequate deck area for stowage of barge hatch covers. Also, breakbulk cargo can be loaded directly onto trailers or trucks for transportation to ashore marshalling, staging, or dump areas.

(5) **Discharge Rates.** These rates vary with the system being used, sea conditions, crane characteristics and operator experience, barge type being used, environmental conditions, crew experience, tug availability, lighterage type and availability, cargo configuration, beach conditions, and MHE availability. Average cargo-discharge cycle time can vary from 2 minutes per load for regularly shaped palletized cargo to over 30 minutes for larger loads (such as vehicles). Hatch covers can be removed and replaced in 6 to 20 minutes each. Raising and lowering folding hatch covers can consume equivalent times, depending on the availability of a power source for raising and lowering the covers.

c. **Barge Marshalling.** Clustering, fendering, and retrograde sequencing are discussed in this section.

(1) **Marshalling and Clustering.** When a barge is discharged from a bargeship, it may be moved into a barge marshalling area or directly to the point of cargo discharge. A marshalling area should be used while the barge is awaiting a cargo discharge site. A primary concern of the JLOTS commander is the safety and security of the barges and their cargoes. Figure VII-6 depicts some methods for barge clustering in a marshalling or safe haven area. All methods require ancillary hardware, maintenance, and space.

(2) **Other Marshalling Techniques.** Another barge-marshalling technique is to beach barges. An anchor, or deadhead, is recommended to prevent the barges from returning seaward. Retrieving barges, however, may require varying degrees of effort depending upon surf conditions and length of time the barges were beached. Long-term beaching, for example, results in fouling the beach around the barges and in a sandbar forming seaward of each barge. Pulling barges off the beach may entail a considerable effort under those conditions.

(3) **Fendering.** Fendering of barges is critical. Tugs require rub rails, rope fenders, tires, ship-type fenders, and/or timbers to prevent steel-to-steel contact. Protruding corners of pontoon warping tugs and landing craft must be fendered from the 1/4-inch thick steel hull of a barge.

(4) **Retrograde Sequencing.** Upon completion of cargo offload, empty barges must be held in a marshalling area to await retracting to a subsequent barge ship. Such marshalling can consume a significant amount of the offload area. Prior to arrival of a barge ship, barges should be arranged to facilitate sequencing onto the ship. Because of the limited numbers of LASH or SEABEE barges available in inventory, retracting of barges is necessary to provide for a continuous delivery of cargo by such barge-ship systems. Since such barges are critical for future transportation requirements, retracting or retrograding barges must be accomplished expeditiously. A two-barge-per-hour backload rate could be maintained in a sea state 2, since this is the limit of LASH and/or SEABEE ship upload capability. If possible, discharge and

LIGHTER ABOARD SHIP BARGE MARSHALLING COMPARISON

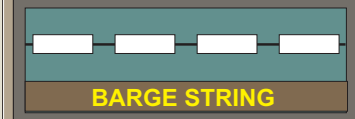
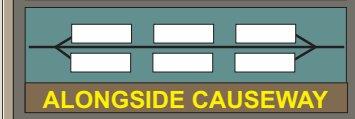
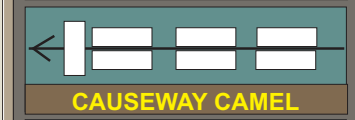
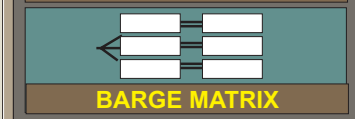
Type of Clustering	Evaluation					
	Ancillary Hardware	Maintenance	Performance	Cluster Placement	Barge Selectivity	Space Requirement
 BARGE STRING	Low	Low	Excellent	Excellent	Poor	High
 ALONGSIDE CAUSEWAY	High	Moderate	Good	Fair	Fair	Moderate
 CAUSEWAY CAMEL	Moderate	Low	Poor	Fair	Poor	Moderate
 BARGE MATRIX	Low/ Moderate	High	Fair	Poor	Poor	Low
 CHRISTMAS TREE	Moderate	Low	Excellent	Good	Excellent	High

Figure VII-6. Lighter Aboard Ship Barge Marshalling Comparison

retrograde of barges should occur simultaneously to produce the greatest use of available assets and to reduce the overall duration of the operation.

d. **Barge Maintenance.** As with other lighterage, when barges are left in an operational area, the JLOTS commander becomes responsible for their maintenance. Because of the limited number of barges, the JLOTS commander must make necessary repairs and maintain them in order that they may be retrograded for future commitments.

e. **Barge Safe Haven Requirements.** In order to protect barges and the cargo contained therein, it is necessary to have a designated barge safe haven area. Barges are vulnerable to weather and sea conditions and, because of their construction, must be protected from contact with each other.

12. Lighterage Salvage Operations

A certain number of casualties to lighterage is probable in a JLOTS operation. The mission of the salvage organization is to keep lighterage lanes and ashore discharge areas clear of disabled lighterage so that movement to and over the beach is maintained (See Appendix N, "Lighterage Salvage Operations").

a. **Salvage Operations.** The JLCC is responsible for coordinating the salvage of lighters throughout an operation. For lighters within the surf zones, that responsibility is delegated to a salvage unit within the beach clearance organization. The JLCC will evaluate the salvage requirements in the operating areas and those assets available there. Adjustments will then be made to the equipment plan to include salvage equipment required but not available in the operating area. As a minimum, dry chemical fire extinguishers and a portable salvage pump (with de-watering and firefighting attachments) will be positioned for rapid response to seaward emergencies. This same equipment will be available with the BCU for use in the surf zone. The JLCC, in coordination with the lighter repair officer, will coordinate the location of post-salvage repair facilities.

b. **Salvage Unit.** The salvage unit in a JLOTS operation is formed from personnel and craft of the assigned units. This ad hoc force will normally use an LCM as a heavy salvage boat; however, SLWTs or other self-powered craft may assist. Surf and beach salvage operations are addressed in Appendix N, "Lighterage Salvage Operations."

c. Unless otherwise directed, salvage of broached, fouled, or craft afloat will be conducted immediately to minimize the repair effort required to return the craft to service. Sunken craft will not be salvaged until directed by the JLCC.

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CHAPTER VIII
SHORESIDE CARGO DISCHARGE OPERATIONS

"Victory is the beautiful, bright-colored flower. Transport is the stem without which it could never have blossomed."

Winston Churchill
***The River War*, 1899**

1. Overview

a. **The mission to conduct cargo discharge operations includes the interfacing of transportation modes in the surf zone, seaward of the surf line and on the beach.** Although most RO/RO transported equipment can be driven off ship-to-shore lighterage, other dry cargoes are discharged by specialized offload equipment and either placed on a land vehicle for further transport or carried directly to an appropriate area. Such transfers can be accomplished at the beach or onto a platform that is connected with a beach. Air cushioned watercraft and amphibians, on the other hand, are capable of transporting cargo directly to a marshalling area, thus eliminating a transfer at the shoreline.

b. Shoreside cargo discharge operations are both scenario- and Service support-dependent. For example, if an amphibious assault operation precedes JLOTS, cargo offload equipment, inherent to such an operation, may be used initially until other cargo discharge systems arrive in the objective area and are deployed. Further, both the Army and Navy have their own lighterage assets and shoreside discharge systems. Their capabilities vary with the discharge systems employed. These systems should complement ship offload systems so there will be sufficient over-the-shore throughput capability to match ship discharge rates. This chapter addresses the Navy and Army shoreside discharge systems that interface the ship-to-shore movement of cargo with the shore or land cargo movement.

2. System Limitations

a. **Weather, surf conditions, and beach gradient impose the primary limitations on shoreside cargo discharge operations.** The ability of the ELCAS and floating piers to support beach transfer operations from beyond the surf has improved beach reception capability. However, lighter and ship cargo transfer operations degrade as sea conditions near sea state 3 and significant wave heights reach 3 feet. At this time, based on actual tests, evaluations, and exercises, the inherent risks of operating in sea state 3 is not practical or cost effective.

b. The ELCAS has been demonstrated to be an effective method of discharging containers and other cargoes. However, operations at the ELCAS are significantly reduced with cross-currents approaching 1-1/2 knots, wave heights of 3 feet or more, or winds in excess of 20 knots. Additionally, the ELCAS 140-ton crane cannot completely unload all containers from fully loaded LCU-2000s unless the craft shifts positions because of the crane's inability to reach outboard containers. The LSV cannot discharge containers at the ELCAS, due to a number of

technical difficulties (unless these lighters reposition themselves, shifting from starboard to port or port to starboard).

c. Planners need to be aware that container transfer at the beach is not possible with some combinations of lighters and beach transfer systems. An example of this interoperability problem is the RTCH, which cannot unload containers from the LCU-1600 and the LCU 2000 because the ramp opening of these vessels are not wide enough for a 20-foot container to pass through.

d. Specific limitations on beach discharge capabilities are discussed in the appropriate sections in this chapter. Other system limitations include the following.

(1) **Yard Tractors.** The yard tractors used to move containers on trailers are equipped with two-wheel drive only, which severely restricts their ability to travel off formed or prepared roads. When used in undeveloped beach facilities, recovery resources must be made constantly available or beach stabilization systems must be in place.

(2) **Deployability.** The ELCAS cranes are heavy lifts and are restricted in their deployability. They require special ships for movement.

(3) **Personnel Augmentation.** As the JLOTS commander plans for in-stream RO/RO discharge and beach clearance, the JLOTS commander may find that organic ship and BCUs do not have the required equipment, number of personnel, or required types of military occupational specialties to accomplish this mission. At this time, the JLOTS commander must consider augmenting the BCUs with equipment and specialized personnel much the same way an Army fixed-port terminal commander does the port support activity. The makeup and use of augmentation personnel should be tailored to the type of equipment and size of the units that will pass over the beach and the amount of cargo to be cleared from the beach. Throughput operations will be impaired if the commander does not adequately plan for enough augmentation personnel and equipment. These augmentees and their equipment may be required to conduct the functions shown in Figure VIII-1. Any specialized equipment or personnel support requirements, such as cots, tents, cooks, messmen, weapons, and communications required by the JLOTS commander, should accompany the augmentation detachments. As the personnel detachments arrive and report to the JLOTS commander, they are divided, as required, to support beach clearance, marshalling yard, and ship operations. These detachments are transferred to the TACON of the JLOTS commander who may then transfer the units to the TACON of appropriate Army cargo transfer company, or a Marine Corps beach and terminal operations company. Normally these detachments will be transferred to the TACON of the BCUs.

3. Floating Causeway Pier Operations

a. Normally, one of the earliest operational requirements in support of a ship-to-shore movement is the assembly and beaching of CWPs. Navy CWPs are installed by the PHIBCBs and Army CWPs are installed by the floating causeway team under TOE 55530. Causeways are maneuvered by SLWTs, modified LCMs, and CSPs. The CWP is designed primarily to form a floating bridge for landing ships and craft when they are not able to approach close enough to the

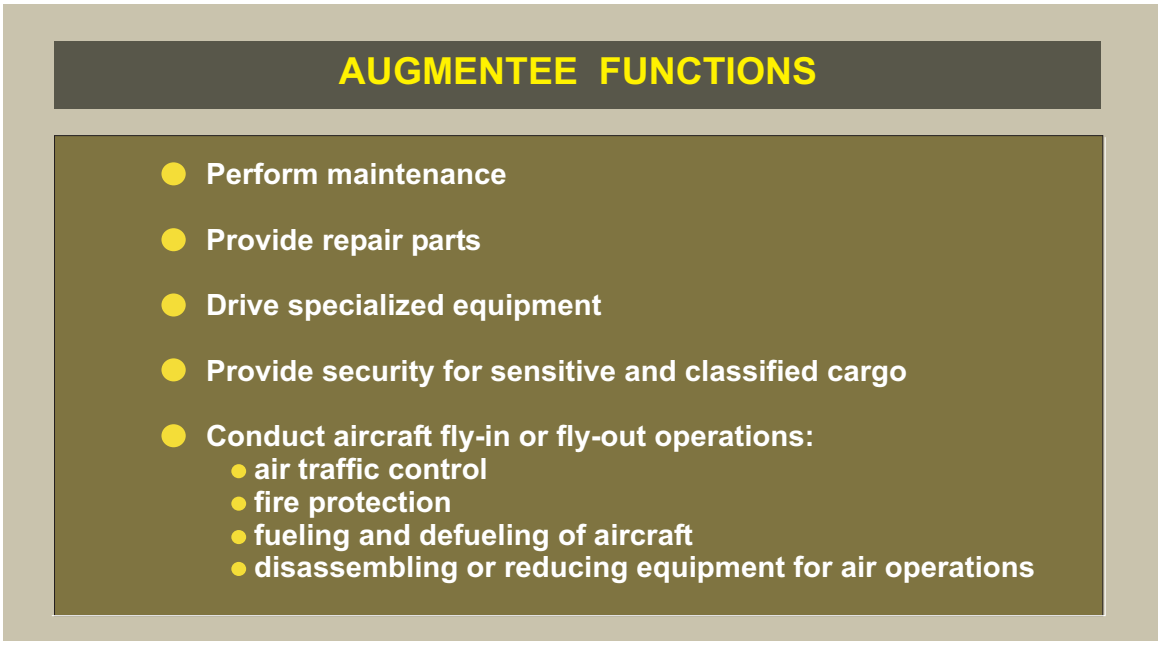


Figure VIII-1. Augmentee Functions

beach to load and unload wheeled or tracked vehicles and equipment directly to the beach. The floating CWP can be relied upon for discharge of all rolling stock and to supplement the ELCAS where it is fully operational. Once beached, the CWPs require tending and occasional repositioning of anchors and repair as they are used to discharge landing craft.

b. Basically, there are two configurations of this pier: the single pierhead (Navy) and the double pierhead (Army). Operationally, the piers can resist a wave height of 4 feet and ride a wave length of 80 feet. The piers are further designed to resist a lateral, 4 knot crosscurrent, assuming adequate anchors are provided. They have a draft of approximately 1 1/2 feet and each section can support 100 STs distributed or one M1A1 tank. Figure VIII-2 depicts components and configurations of both floating CWPs.

(1) **Navy CWPs.** The Navy CWP normally consists of no more than 12 NL causeway sections and anchoring system. The NL sections are 21 feet wide and 90 feet long. Navy CWPs are erected to a minimum length needed but no longer than 1,080 feet. The Navy CWP will vary in length depending on site conditions. Once the sections have been beached, they are held in place by two dozers while the anchoring system is installed. Configurations of the single-pierhead CWP is shown in Figure VIII-2.

(2) **Army CWPs.** The Army CWP consists of nonpowered modular causeway sections that are 80 feet long and 24 feet wide and an anchoring mooring system. It is designed to extend from the mean high water line out into the surf zone to a minimum MLW depth of approximately 6 feet (Army LSVs require a depth of 12 feet MLW). The maximum working length, during operations, will be determined by the beach gradient. Efficient insertion of the CWP (stabbing the beach) onto the prepared beach site requires a minimum of three SLWTs or CSPs or a combination of both (LCM-8s can assist). If there is negligible current and little wind, then two

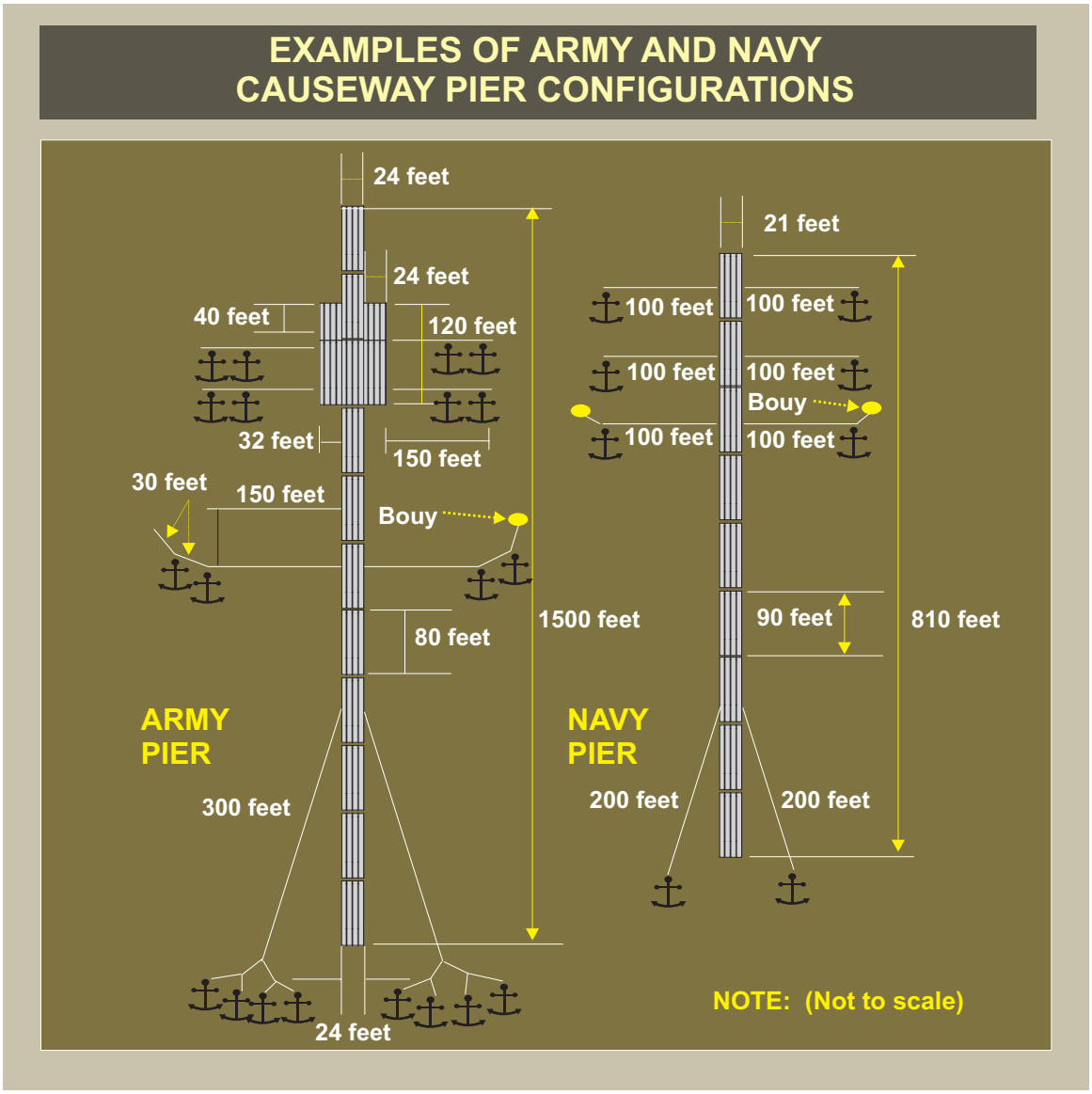


Figure VIII-2. Examples of Army and Navy Causeway Pier Configurations

powered craft should be able to make an accurate landing. Configuration of the Army CWP is shown in Figure VIII-2.

c. The JLOTS planners can determine the proper pier length and seaward end depth of the floating CWP by analyzing both the beach survey and types of lighters that will be used during the operation. A minimum depth of 15 feet at MLW is required at the seaward end of the CWP to assure sufficient depth for the stern of the LSV. (LSV is 273 feet long with a maximum stern draft of 12 feet.) This depth allows the LSV, LCU-2000, and LCU-1600 access to the seaward end of the pier.

d. Breakbulk cargo or containers are not normally discharged from lighterage over a floating causeway unless they are on chassis or other wheeled flatbeds and can be driven or towed from lighterage.

e. The preferred method for transferring RO/RO cargo is directly to a beach. If this is not feasible due to the beach gradient, LCUs and LSVs are also capable of transferring RO/RO cargo over the seaward end of a floating CWP.

4. Elevated Causeway Operations

The ELCAS provides a means of delivering containers, vehicles, and bulk cargo ashore without the lighterage contending with the surf zone. The ELCAS was described in Chapter VI, "Ship Discharge Operations." Breakbulk and/or rolling stock (within crane lift capacity) can also be handled by the ELCAS from LCUs, LCMs, LASH or SEABEE barges, or CFs.

a. **Container Cargo.** The container handling operation consists primarily of transferring containers from lighterage to the ELCAS and then transporting the containers to staging areas on shore. Empty trucks or trailers are driven onto the ELCAS and onto a turntable where they are rotated 180 degrees. They are then driven to a position in front of a container-handling crane. The crane on the pierhead transfers the containers from the lighterage moored alongside to the truck or trailers. After loading, the truck or trailers move from the pierhead along the ELCAS to the beach. The ELCAS (M) roadway is of sufficient width to accommodate two-way truck traffic.

(1) Manual spreader bars and slings are available only for transferring containers. In relatively calm seas, the spreader bar is faster because connection to the container is performed with one locking action. In heavy swells, however, the spreader bars (weighing 3,000 pounds) are difficult to control during the mating operation. The sling is used under these conditions. It is dropped onto the container and the four legs with attachments are fastened to the four lower corners of the container. The crane then lifts the container from the lighterage and places it on a truck or trailer. The truck moves on to the roadway where the container is lashed down. The next truck from the turntable is driven into the loading position. The truck with the container then exits the causeway.

(2) Shifting (warping) will be required for the various types of lighters (2000 Class LCUs and CFs) that will be mooring at that ELCAS. These lighters must be warped because the current ELCAS crane is not capable of reaching and lifting all containers from fully loaded vessels. Due to their overall smaller deck dimension, LCU-2000's must still be warped. LCMs, CFs and 1600-Class LCUs are not required to warp at the ELCAS, but these lighters are usually unloaded at other beach heads.

b. **RO/RO Cargo.** RO/RO cargo is not normally discharged by lighterage over the ELCAS but directly to the beach. However, if RO/RO cargo were discharged to the ELCAS, then it would be lifted off by cranes and driven or towed to the beach. However, the ELCAS cranes are not capable of lifting all equipment. Some extremely heavy cargo may exceed crane capacity. Assessment must be made prior to discharging anything for lift with the crane on ELCAS. The ELCAS does not come with vehicle slings or personnel trained in vehicle operations. If vehicles or breakbulk cargoes are to be lifted, the necessary slings and appropriate cargo handling personnel must be provided.

c. **Breakbulk Cargo.** Breakbulk cargo can be discharged from lighterage by ELCAS cranes into awaiting trucks or trailers and transported to the beach. Because of crane cycle time, discharge onto the beach is more efficient.

d. **Limitations.** Operations are conducted up to and through sea state 2. The limiting conditions are related to the lighterage capabilities for unrestricted operations. Sea state 3 conditions significantly limit or stop discharge operations.

5. Amphibian Operations

Two types of amphibians are currently in the inventory — ACVs and wheeled amphibians.

a. **Air Cushion Vehicles.** The Navy's LCAC is used primarily as an amphibious assault vehicle. The LCAC can also be employed in JLOTS operations.

b. **Wheeled Amphibians.** Wheeled amphibians will normally be employed to carry breakbulk cargo, containers, or bulky and outsized wheeled and tracked vehicles.

c. **Wheeled Amphibian Parks.** Amphibian parks are required for maintenance of craft and holding craft not immediately needed for the operation. They will be located on firm trafficable soil, close enough to the operating site to allow the amphibians to move to or from the beach on call. The area must allow enough room for dispersion and concealment.

6. Bare Beach Operations

The extent of operations on a bare beach is dependent on beach gradient and characteristics, weather, wave height and characteristics, beach consistency, and the type of cargo transiting the beach. Since cargo is offloaded in the surf zone, particular care must be taken with some cargoes to ensure protection from wetness, weather, damage, and being stalled because of lack of traction. Wet landings, however, may not be permissible for vehicles, supplies, and equipment not specifically waterproofed.

a. **Container Cargo.** Specialized equipment (RTCH or RTCC) is used to discharge containers from beached CFs and double-wide modular CFs (DWMCFs). The RTCH is the most efficient method of offloading CFs. They pick the container up while on the ferry and place it aboard the container trailer ashore, eliminating double handling on the beach. The containers are then transported to a marshalling area well clear of beach operations or directly cleared from the beach and marshalling areas altogether. Stuffing and unstuffing of containers will not occur at the discharge point. This activity will occur at the marshalling area. Forty-foot containers can be loaded onto the DWMCF, which measures 48 feet wide by 160 feet long, and will be unloaded with the RTCH using a 40-foot spreader bar. The RTCC is capable of lifting a 20-foot container weighing 44,800 pounds and 35-foot and/or 40-foot container weighing 67,200 pounds.

b. **RO/RO Cargo.** RO/RO cargo is simply driven or towed off the lighterage on to the beach to a staging area.

c. **Breakbulk Cargo.** Breakbulk cargo is normally discharged to the beach by an RT forklift. Trucks, tractor trailers, or rough terrain forklift trucks will be required to move breakbulk cargo from beach discharge points to staging areas.

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CHAPTER IX
BEACH AND PORT CLEARANCE AND MARSHALLING OPERATIONS

"Picture puzzles are child's play compared with this game of working an unheard-of number of craft to and fro, in and out, of little bits of beaches."

Sir Ian Hamilton
***Gallipoli Diary I*, 1920**

1. Overview

a. The ability to clear cargo from a beach depends upon the physical features of the beach, weather, oceanographic features, the tactical situation, and the organization and equipment of the BCUs assigned to the operations. To obtain beach throughput effectiveness, clearance units must reach and maintain maximum transfer and clearance rates.

b. **Beach throughput is dependent on receipt, transfer, and clearance rates.** The receipt capability is based on the availability of discharge points such as CFs, amphibian exit points, splash points of LCUs, and LSVs. The transfer rate is the rate cargo is unloaded from lighters. Beach transfer begins when the crane or MHE connects and begins lifting the cargo from the deck of the lighter and ends when the cargo is placed on a transport vehicle. In the case of amphibian vessels, transfer begins when the vessels exit the water en route to the cargo and container marshalling yard. In the case of wheeled vehicles, transfer begins when the vehicle starts moving from the lighter deck and ends when it is clear of the beach. The clearance rate is the rate at which cargo is moved from beach transfer points to staging and marshalling areas. **Throughput is a major consideration to effective JLOTS operational productivity.**

c. Details of beach clearance and marshalling operations, including cargo accountability, are subject to change to conform to the supported forces procedures. Such operations will be addressed in the JLOTS commander's OPORD.

2. Beach and Marshalling Area Organization

a. **Beach Area.** Within the beach area, locations must be established and clearly marked for lighter and amphibian vehicle landing sites, staging and loading area, bulk fuel and water storage, Class V dumps, and beach operational support areas (billeting, messing, maintenance, services, C2, and other support areas). Local security requirements should be considered in site selection. Vehicle traffic routes and ACV routes connecting landing sites, staging areas, and dumps must be selected and clearly marked. One-way traffic patterns should be established whenever possible. Amphibian vehicle landing sites should be located on one flank of the beach. Class V landing sites and dumps should be located on the opposite flank. Landward water systems, amphibious assault, and inland distribution petroleum fuel systems, including connecting lines, must be considered when preparing for beach transfer and clearance operations. Chapter XI, "Liquid Cargo Offshore Operations," details liquid cargo operations. See Figure IX-1 for general beach area organization, and Chapter IV, "Joint Logistics Over-the-Shore Systems, Facility Installations and Preparations," for dispersion of facilities.



Figure IX-1. Joint Logistics Over-the-Shore Operational Area

b. **Marshalling Area.** A large inland staging area is one key to continuous throughput. Distance from the beach and road network, drainage, and soil conditions should be considered in the selection area. Engineers should evaluate soil and weather conditions to determine requirements for soil stabilization. The staging or marshalling area is operated by a BCU and is organized into holding areas and loading areas. The loading areas are located near beach and staging and/or marshalling area exits to load and document cargo for transportation inland to the operational area. The holding areas are used to stage containers, vehicles, and equipment pending transportation to dumps or issue points. Additionally, a holding area is established for empty containers awaiting retrograde. If the road network and traffic flow permit and the staging area is large enough, the holding areas for containers and vehicles or equipment may also be used as holding points. Containers, vehicles, and equipment moving off the beaches to the staging or marshalling area are identified and documented by the documentation detachment and clearance unit. Each load is then directed to a proper holding or loading area.

c. **Beach and Port Operational Organizations.** Operational units to conduct beach and port transfer and clearance operations are specified in the JLOTS commander's OPORD. Although the Army, Navy, and Marine Corps have organizational differences, their beach and port operations responsibilities are similar and are discussed below.

(1) **Beach Operations and Control Organizations.** In a JLOTS operation, the BCUs are normally task-organized around an Army cargo transfer company from a terminal service battalion, Navy beachmaster unit (BMU), or from a Marine Corps landing support company from a transportation support battalion. The beach area is controlled by either Marine Corps landing support personnel or an Army transportation terminal battalion. For smaller JLOTS operations, a BCU could be task-organized around a platoon from one of the previously mentioned elements. The beach landing sites and/or transfer points are controlled by a Navy BMU or an Army BLCP established to direct lighters to specific transfer points. Beach and amphibian transfer points (i.e., ELCAS, CWPs, bare beach sites, ADSs) have a designated OIC or noncommissioned OIC of each site when the vehicle arrives at that site. Cargo movements between transfer sites and the staging areas or marshalling yard are controlled by the BCU commander. A notional beach layout is shown in Figure IX-2. The areas depicted in the figure are not all-inclusive, but give the planner a basic idea of those responsibilities with which a BCU commander must be concerned.

(2) Responsibilities of a task-organized BCU commander include, but are not limited to, the following.

(a) Providing the beach area necessary C2 to coordinate cargo transfer and clearance.

(b) Organizing and developing the beach area as necessary to support throughput, to include designation and establishment of overflow areas.

(c) Coordinating the locations of the initial bulk fluid (water and fuel) transfer points.

(d) Unloading lighterage at the beach and establishing beach and staging and/or marshalling area near inland road networks.

(e) Providing direction for drivers to move vehicles from the lighterage.

(f) Coordinating local security.

(g) Providing beach clearance vehicle assignment to transfer points.

(h) Preparing to continue beach operations for continuous resupply.

(i) Accomplishing required cargo documentation.

(j) Coordinating required medical support.

(k) Coordinating required vehicle, beach, channel, and road maintenance.

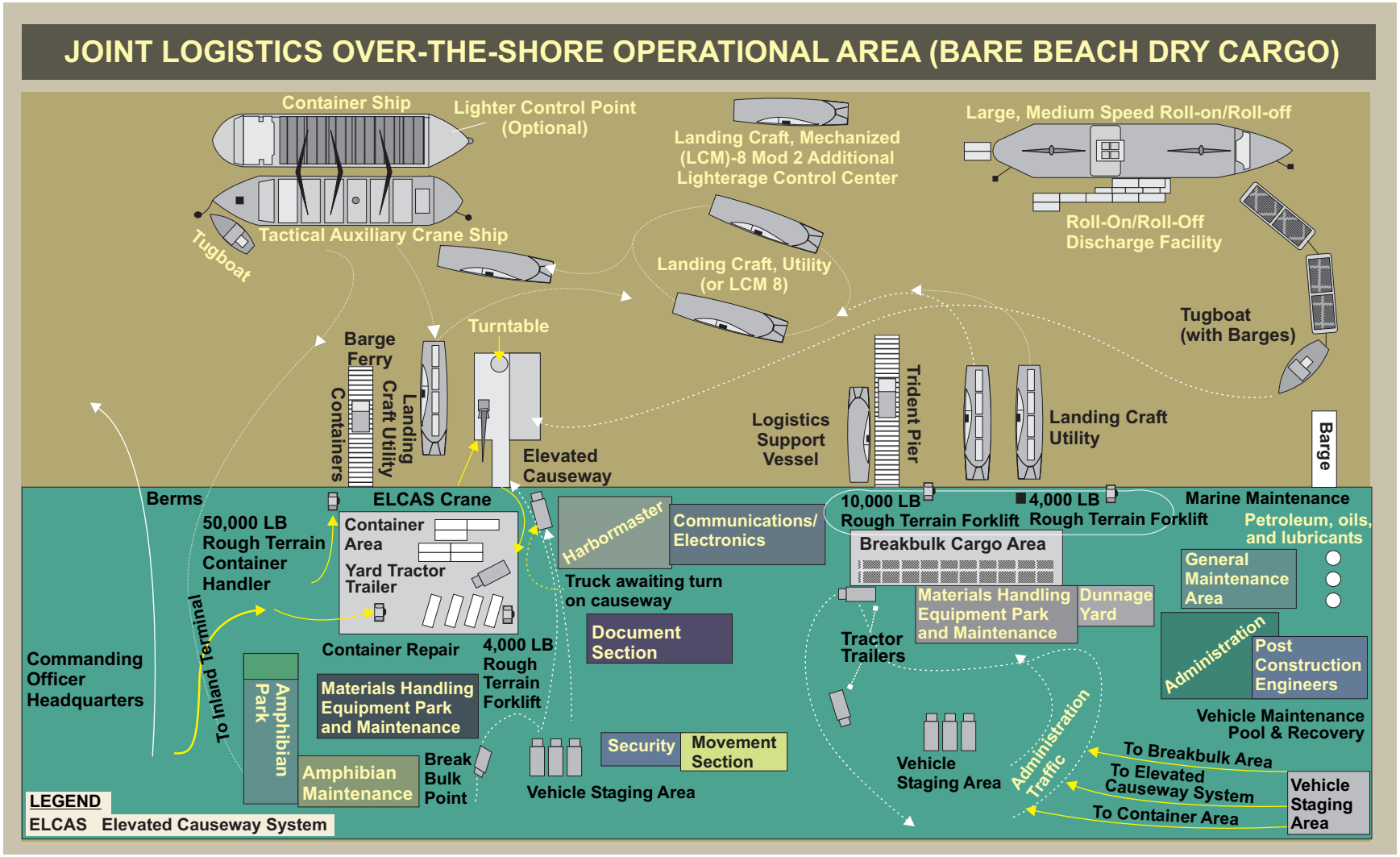


Figure IX-2. Joint Logistics Over-the-Shore Operational Area (Bare Beach Dry Cargo)

3. Port Operations

JLOTS operations, as noted in Chapter I, "An Overview of Logistics Over-the-Shore Operations," may be conducted in fixed-ports. This section deals with those operations. The port operations organization is responsible for the port facilities and the throughput of supplies and equipment as they are offloaded from the ships. The port operations organization operates under the overall direction of the JLOTS commander in coordination with the ship's lighterage control point (LCP) or debarkation officer. A typical port operation is shown in Figure IX-3. Specifically, the port operations organization is responsible for the following tasks.

For more information on fixed-ports see JP 4-01.5, Joint Tactics, Techniques, and Procedures for Transportation Terminal Operations.

a. Establishing overflow areas for supplies and equipment.

b. Clearing piers and overflow areas of material.

c. Establishing a port operations command post and communications with the JLOTS commander and ship's LCP or debarkation officer.

d. Establishing liaison with host-nation port authorities for employment of cargo and MHE, operations and longshoremen support, drayage, and dunnage.

e. Operating cargo and MHE, including shore-based cranes, forklifts, tractors, dollies, lighting, and other cargo and equipment.

f. Assisting cargo-handling units in ship offload, as directed, and transporting cargo to overflow areas as necessary.

g. Providing direction to drivers detailed to move vehicles from the port to staging and/or marshalling areas.

h. Providing local security assisted by supported force augmentation.

i. Providing command support for the port operations organization (billeting, messing, administration, and other command support).

j. Establishing bulk fuel or water reception and transfer facilities using local facilities.

k. Preparing to continue port operations under joint Service operations.

l. Establishing ACV routes to air, rail, or road networks.

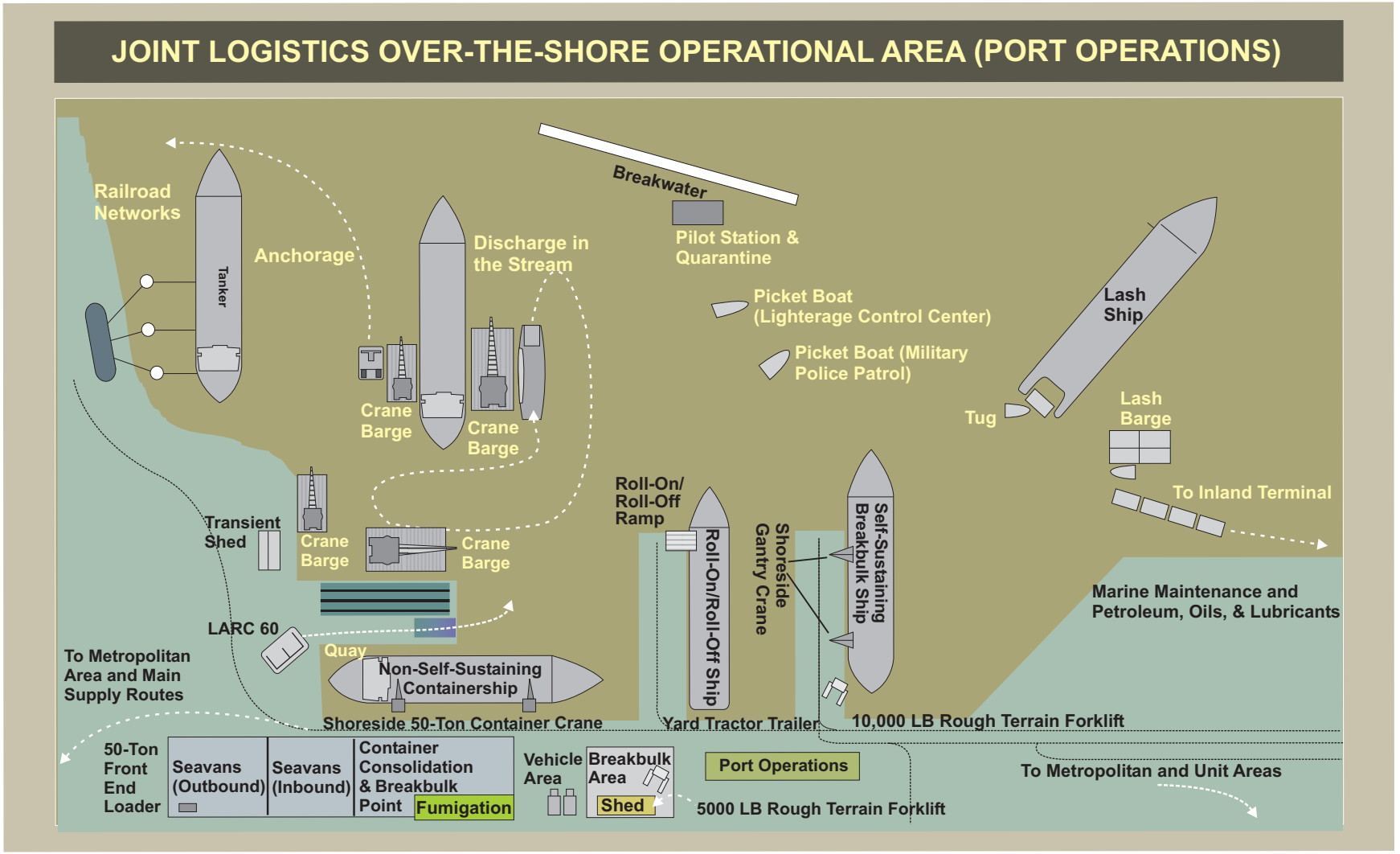


Figure IX-3. Joint Logistics Over-the-Shore Operational Area (Port Operations)

4. Marshalling Area Operations and Control

Cargo will be turned over to the separate Service organizations in the marshalling area and prepared for onward movement in accordance with established Service procedures.

a. **Control Operations.** The marshalling area will be controlled by the Marine Corps CSS element or Army cargo transfer company personnel who are responsible for the following marshalling area functions.

(1) Offering containers to the movement control agency for assignment to clearance mode.

(2) Transferring containers from amphibians or from intra-terminal vehicles to clearance mode.

(3) Marshalling other containers by destination, forwarding mode, priority, and commodity.

(4) Recording receipt, condition, and location of container.

(5) Maintaining current container inventory using automated or manual techniques.

(6) Loading containers onto chassis or transporter for movement to destination or to railhead, airhead, or inland waterway terminal.

(7) Accomplishing necessary documentation for accounting and onward movement.

(8) Stuffing and unstuffing containers.

(9) Retrograding of containers.

(10) Establishing necessary RFID infrastructure to capture in-transit visibility of all tagged items as they enter and exit the area, to include re-writing tags for break-bulk operations.

b. **Equipment.** RTCHs are used at the beach discharge point and the marshalling area to move containers from crane side or CFs to waiting clearance trailers or to relocate containers within the marshalling area. At the amphibian discharge site, cranes will remove containers from the amphibians and place them directly onto waiting vehicles. Where this is not possible or to speed operations, an RTCH may be used to lift the containers from crane side onto the vehicles. RTCHs are used at the container marshalling area to place containers on clearance vehicles. Some containers are removed from the JLOTS site or from yard tractor-trailers to the marshalling area for temporary storage.

c. **Breakbulk and Vehicle Operations.** A marshalling area for temporary storage of breakbulk and vehicles is also designated. Such cargoes or vehicles arriving at the marshalling

area from the discharge point are met by cognizant marshalling area representatives who direct them to storage locations. For cargo clearance, the procedure is reversed. Clearance will be coordinated by the supported force's movements section and clearance vehicles will be controlled by the mode operators.

5. Equipment

The RTCC and the RTCH are two systems that provide beach clearance and marshalling yard units with excellent container handling capabilities. Both systems are capable of lifting and transferring 20-, 35-, and 40-foot ISO containers. The RTCH's four-wheel drive and capability to ford up to 5 feet of salt water make it well-suited for removing containers from both single- and double-wide CFs and LSVs. While the RTCC has a rough terrain capability, it is best used in fixed-position situations that are more often found in the staging or marshalling areas. The RTCC can reach and lift a 20-foot container at a 27-foot boom radius and a 40-foot container at a boom radius of 22 feet. Small RT forklifts are used effectively at the beach when transferring breakbulk or palletized cargo from lighters moored to floating CWPs or beached ("feet dry") at the bare beach sites.

CHAPTER X
CARGO CONTROL AND DOCUMENTATION

"It is very necessary to attend to all this detail and to trace a biscuit from Lisbon into a man's mouth on the frontier and to provide for its removal from place to place by land or by water, or no military operations can be carried out."

The Duke of Wellington, 1811

1. Overview

The Department of Defense uses DOD 4500.9-R, *Defense Transportation Regulation, Part II Cargo Movements*, to provide specific guidance for documenting cargo movements. This chapter provides information on specific Service cargo control and documentation systems that are used to receive and process DOD 4500.9-R, *Defense Transportation Regulation*, data in a JLOTS operation such as the MAGTF II/logistics automated information system (LOGAIS), and Worldwide Port System (WPS). Additionally, information is provided on new automation identification technology data capture methods such as two-dimensional bar-code military shipping labels, radio frequency identification tags, and satellite tracking systems. These technologies support key automated information systems, such as Joint Total Asset Visibility, and Global Transportation Network, which provide visibility of assets within the DOD transportation system. JLOTS is a unique and demanding military operation requiring the benefit of the best available cargo control documentation methods and procedures.

2. Surface Deployment and Distribution Command

SDDC will provide expertise to the JLOTS commander on cargo control and documentation matters including manifest, cargo traffic messages, and stow plan information. SDDC is also responsible for documenting the receipt and/or movement of cargo using the WPS and other theater water terminal transportation and/or logistics automated data processing (ADP) systems. SDDC will coordinate theater required ship loading requirements with appropriate SPOEs and will task the seaport of debarkation (SPOD) port operator based on the combatant commander's priorities and guidance as relayed by the JLOTS commander.

3. Defense Transportation Regulation

See Figure X-1.

The following outlines the cargo control and documentation standards of DOD 4500.9-R, *Defense Transportation Regulation*.

a. **DOD 4500.9-R, *Defense Transportation Regulation,* serves primarily to outline the documentation used in accounting for the condition and controlling the movement of cargo.** It prescribes the standard data elements, codes, formats, forms documents, rules, methods, and procedures for the transportation of material.

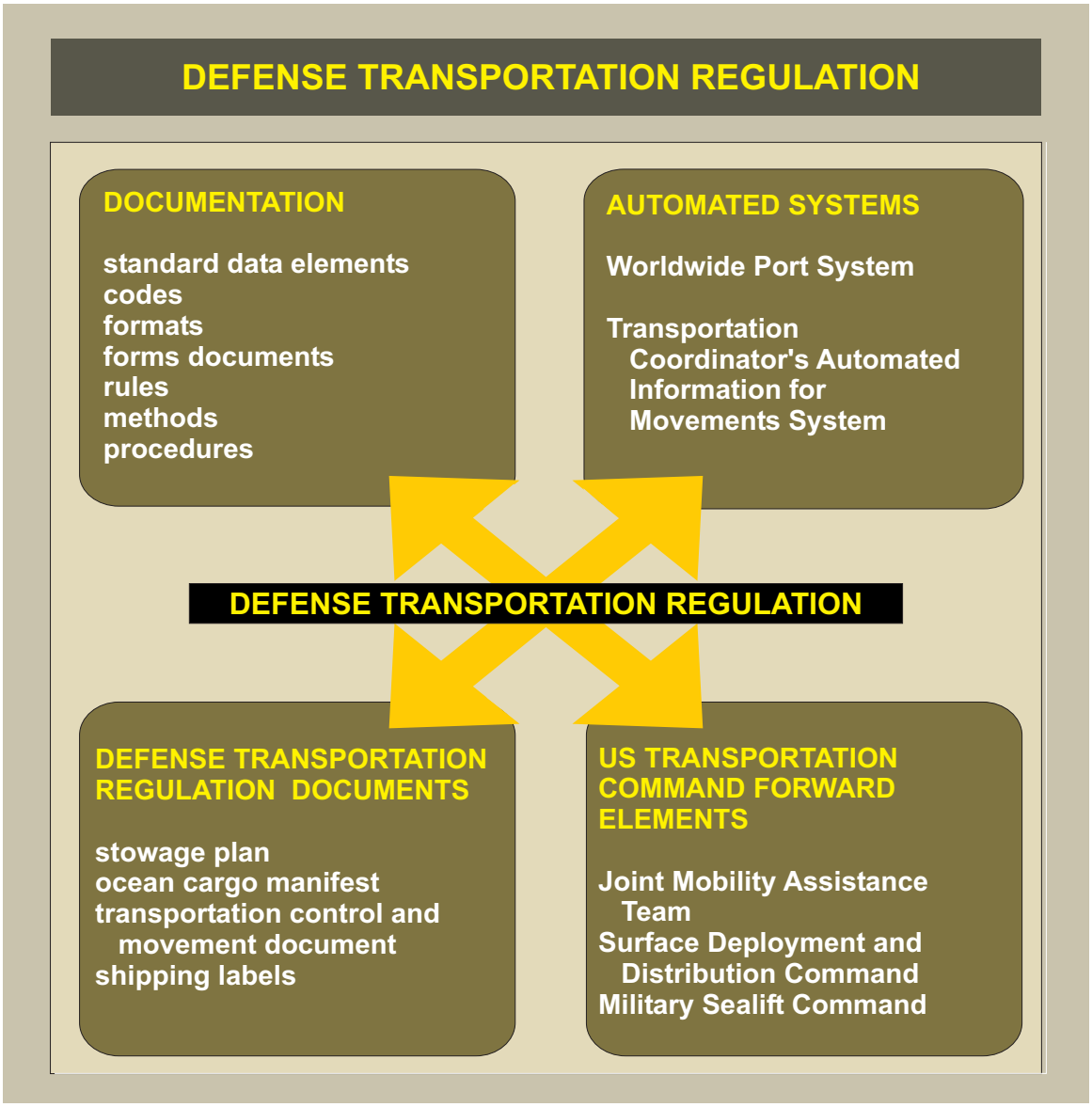


Figure X-1. Defense Transportation Regulation

b. The four most important DOD 4500.9-R, *Defense Transportation Regulation* documents used in JLOTS and other beach operations are the stowage plan, ocean cargo manifest (a "ship's manifest," DD Form 1385), transportation control and movement document (TCMD), (DD Form 1384), and shipping labels (DD Form 1387). Each piece of cargo has the latter shipping label that indicates the lot of cargo, or shipment unit, of which it is a part of the TCMD. Other information about these documents follows.

(1) **Transportation Control and Movement Document.** A TCMD is prepared for each shipment unit, as defined in DOD 4500.9-R, *Defense Transportation Regulation*. The shipment unit can be one or more pieces of cargo. The TCMD provides information required to physically handle the cargo, its routing, priority, and destination. In addition to providing this

information, the TCMD serves as a receipt for the cargo and its condition as it is moved through the transportation system.

(2) **Ocean Cargo Manifest.** Ocean cargo manifests are made for each port of call on a ship's voyage. Hazardous cargo is described in a separate section of each manifest and must be certified as prescribed in DOD 4500.9-R, *Defense Transportation Regulation*. These manifests provide information on the vessel and all cargo destined for a given port of call. Information on the vessel includes its type, charter, estimated time of arrival, and self-sustaining characteristics. The stowage location and reprint of all information on the TCMD is given for all cargo to be discharged at the port. The ocean cargo manifest (formatted in accordance with DOD 4500.9-R, *Defense Transportation Regulation*) must be transmitted electronically to the JLOTS commander for entry into the automated cargo documentation system. Additionally, the cargo ship should receive, from the SPOE, a copy of the ocean cargo manifest database on computer magnetic media (floppy disc) and/or a hard copy of the manifest prior to departure. JLOTS documentation personnel at the SPOD can use the ship's manifest to aid in verifying, if required, their own manifest that was electronically transmitted.

(3) **Ship Cargo Stowage Plan.** A stowage plan is a diagram of a ship on which is overlaid the location of all cargo stowed aboard the vessel. The stowage plan is part of the integrated computerized deployment system (ICODES) which supports administrative, tactical, and pre-position load planning for breakbulk, container, RO/RO, and fast sealift ships operations.

(4) In a JLOTS operation, the stowage plan and ocean cargo manifest are used for overall operational planning. The shipping labels, TCMDs, and stowage plan are used to identify and track the individual pieces of cargo moving through the operation. Documentation team members with portable bar code recorders (PBCRs) should be located on the ships in order to expedite cargo reading and have communications with the documentation OIC ashore to provide pertinent information.

4. Worldwide Port System

a. **WPS is an SDDC automated information system developed to support water terminal operations during wartime and peacetime.** The major water terminals supported are common-user water terminals in a theater and water terminal units designated to support US Army contingency missions.

b. WPS is a menu-driven computerized system that consists of a thin-wire local area network composed of microcomputer workstations, database file servers, multiple high-speed and specialty printers, and other peripherals. It supports the needs of the JLOTS commander by satisfying the cargo accounting, documentation, manifesting requirements, and related functions of a water terminal while concurrently meeting the requirements of DOD 4500.9-R, *Defense Transportation Regulation.* WPS incorporates the use of PBCRs to further automate data capture in the water terminal environment.

c. PBCRs are used to electronically read and temporarily store data contained in bar code labels that are attached to the cargo. The bar code labels contain the coded transportation control number plus clear descriptive data for ease of matching labels and equipment. This information is stored in the PBCR's memory and then down-loaded directly to the WPS at designated intervals or as the PBCR's memory is full. Once data is resident in the WPS, reports can then be produced as required by the JLOTS commander.

5. Marine Corps Air-Ground Task Force II/Logistics Automated Information System

a. The Marine Corps' system, MAGTF II/LOGAIS contains subsystems and a unit database allowing transportation personnel to provide accurate and timely movement data to the DTS. The Transportation Coordinator's Automated Information for Movement System (TC-AIMS) is the link to the DTS, which provides the JLOTS commander with an automated capability to plan, coordinate, manage, and execute movements of cargo. TC-AIMS is also compliant with DOD 4500.9-R, *Defense Transportation Regulation,* and interfaces with SDDC's WPS.

b. The MAGTF deployment support system II (MDSS II) is the MAGTF II/LOGAIS database planning tool that provides units the ability to accurately track, report, and account for major equipment and supply items, and personnel. It provides real-time information for export to TC-AIMS ICODES and the automated aircraft load planning system aircraft load planning). MDSS II provides the MPF community with a variety of tools to assist in planning and tracking pre-positioned equipment and supplies. MDSS II utilizes automated information technology to update a unit's equipment and supplies database via direct download or wireless transmission from a data collection device.

c. The MDSS II and TC-AIMS functions of the MAGTF II/LOGAIS will feed information into the joint force requirements generator and the global command and control system.

6. Transition

Each JLOTS-supported Service will use its own cargo documentation and accountability systems until the JLOTS commander shifts to a single system.

7. United States Transportation Command Forward Elements

USTRANSCOM may place elements from its transportation component commands in a theater to provide management of strategic mobility operations into and out of the theater.

a. **Joint Mobility Assistance Team (JMAT).** A JMAT is a USTRANSCOM system of people, procedures, and ADP equipment that provides dedicated transportation expertise and C2 and/or in-transit visibility information to the JFC. JMATs are designed to provide a framework for integrating existing transportation data to the maximum extent possible for the JFC.

b. **Surface Deployment and Distribution Command.** USTRANSCOM provides SPM for seaports through its transportation component command (TCC) SDDC. SDDC performs those functions necessary to support the strategic flow of forces, equipment and sustainment during deployment and redeployment through SPOEs and SPODs. SDDC is also responsible for providing strategic deployment status information to the combatant commander and to workload the SPOD port operator based on the combatant commander's priorities and guidance provided by the JLOTS commander. Geographic combatant commanders may designate many elements to be the port operator or entry into a CAA with USTRANSCOM to allow SDDC to operate some or all water terminals including JLOTS sites. The specific roles and functions of the port manager are summarized in Appendix M, "Unit Capabilities."

c. **Military Sealift Command.** MSC usually establishes Military Sealift Command Offices (MSCOs) at theater port facilities, as directed by CDRUSTRANSCOM. Each MSCO is responsible for coordinating the arrival and loading or discharge and departure of ships under the OPCON of MSC.

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CHAPTER XI
LIQUID CARGO OFFSHORE OPERATIONS

"Excuses for failure attributed to shortness of fuel will be closely scrutinized; and justly."

Mahan
***Naval Strategy*, 1911**

1. Overview

Liquid cargo operations may be viewed in three distinct increments.

a. Ocean transport of liquid cargo from origin to offshore locations in the AOR.

b. Cargo transfer operations from offshore to the high water mark.

c. Beach storage and/or distribution area operations.

2. Joint Logistics Over-the-Shore Commander's Responsibility

The JLOTS commander is responsible for offshore bulk fuel system operation, beginning with the reception of OBFS or OPDS vessels and extending to the installation and operation of OBFS to their termination point on the beach. For OPDS, the termination point is the beach termination unit (BTU) that interfaces with the Army IPDS and the Marine Corps AAFS. Military units operating these systems may or may not be under TACON of the JLOTS commander, depending on C2 arrangements identified in the JFC's JLOTS directive. In any case, close coordination is required between the JLOTS commander and the Army, Navy, and Marine Corps units to ensure continuity of liquid cargo operations. The organization for conducting bulk fuel operations during JLOTS is shown in Figure XI-1.

3. Ocean Transport Arrival

a. **Arrival.** Ship arrival information is the same as that in Chapter V, "Ocean Transport," on dry cargo ship arrival.

b. **Assigning Anchorages.** Some of the factors in assigning tanker anchorages are the length of the discharge system to be used, the tanker draft, and the water depth. Initial anchorage assignments for tankers should be made before a tanker's arrival in the offload area. The assigned offload control authority is responsible for assigning anchorages.

4. Cargo Transfer Operations

This section describes the amphibious bulk liquid transfer system (ABLTS), OPDS, and Army IPDS fuel system operations. The initial system for transferring fuel from points offshore to reception areas on the beach is called the OBFS and consists of two subsystems: ABLTS and

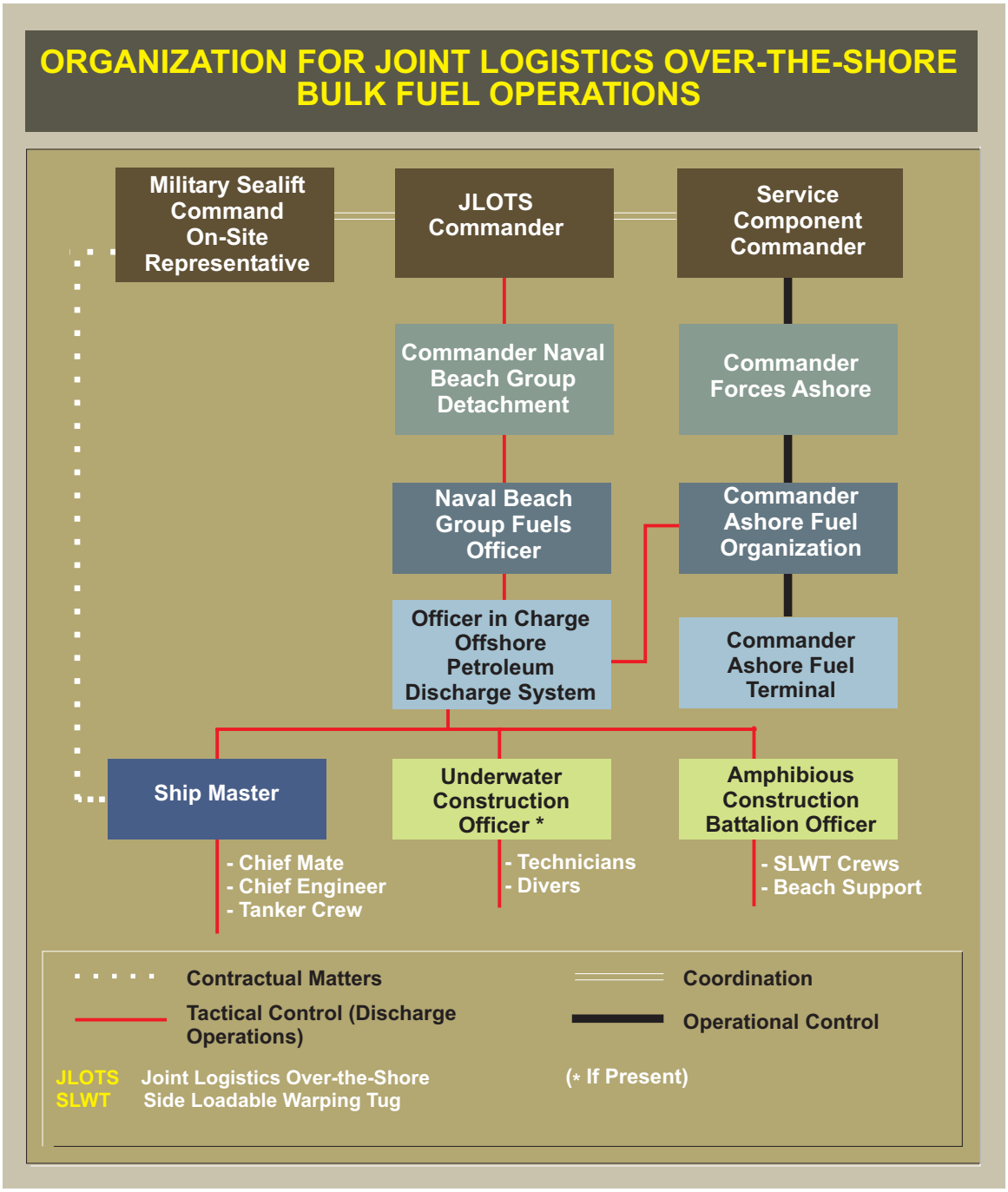


Figure XI-1. Organization for Joint Logistics Over-the-Shore Bulk Fuel Operations

OPDS. The Army's IPDS connects to the BTU for reception, storage, and distribution of fuel in JLOTS operations. System capabilities, components, limitations, and organization and responsibilities for installation and operation are discussed in the following paragraphs.

a. **ABLTS.** The bulk fuel discharge system supporting Marine Corps amphibious assaults and MPF operations is the ABLTS. It consists of 10,000 feet of buoyant 6-inch hose deployed from each MPF ship except the MPF(E) ships. The ABLTS is an integral part of the MPF bulk

fuel transfer systems and is designed to provide the initial means of transferring those ships' fuel cargo ashore. The system has a 600 gallons per minute (GPM) capacity. Although rapidly installable, the system has a limited life expectancy because it floats on the surface. For sustained operations, a more permanent system must be installed to meet continuing demands of a large force. Operation of the ABLTS is the responsibility of the PHIBCB. Operation is limited to sea state 3.

b. **Offshore Petroleum Discharge System.** The OPDS was designed to provide the Service components in an operational area with large volumes of refined petroleum products over a sustained period. The OPDS consists of two major components; a specially configured product tanker and a mobile tanker terminal, as shown in Figure XI-2. There are four OPDS tankers, of which two are normally forward-deployed. The remaining tankers are in MARAD RRF five and ten day readiness status. Three of the tankers (SS PETERSBURG, SS CHESAPEAKE, and SS MOUNT WASHINGTON) contain a crane and stowage cradles for five OPDS utility boats (OUBs) (modified LCM-6s). OUB equipped tankers carry adequate SLWT outfitting to equip one SLWT as a towtug and one SLWT as a lay repair boat carry one complete tanker terminal, and are equipped with five OUBs to deploy it. These tankers also have a maximum 59 LT capacity crane to load/offload the five OUBs carried onboard. The OUBs are fully outfitted and configured to provide these tankers with full capability for OPDS deployment. All OPDS tankers

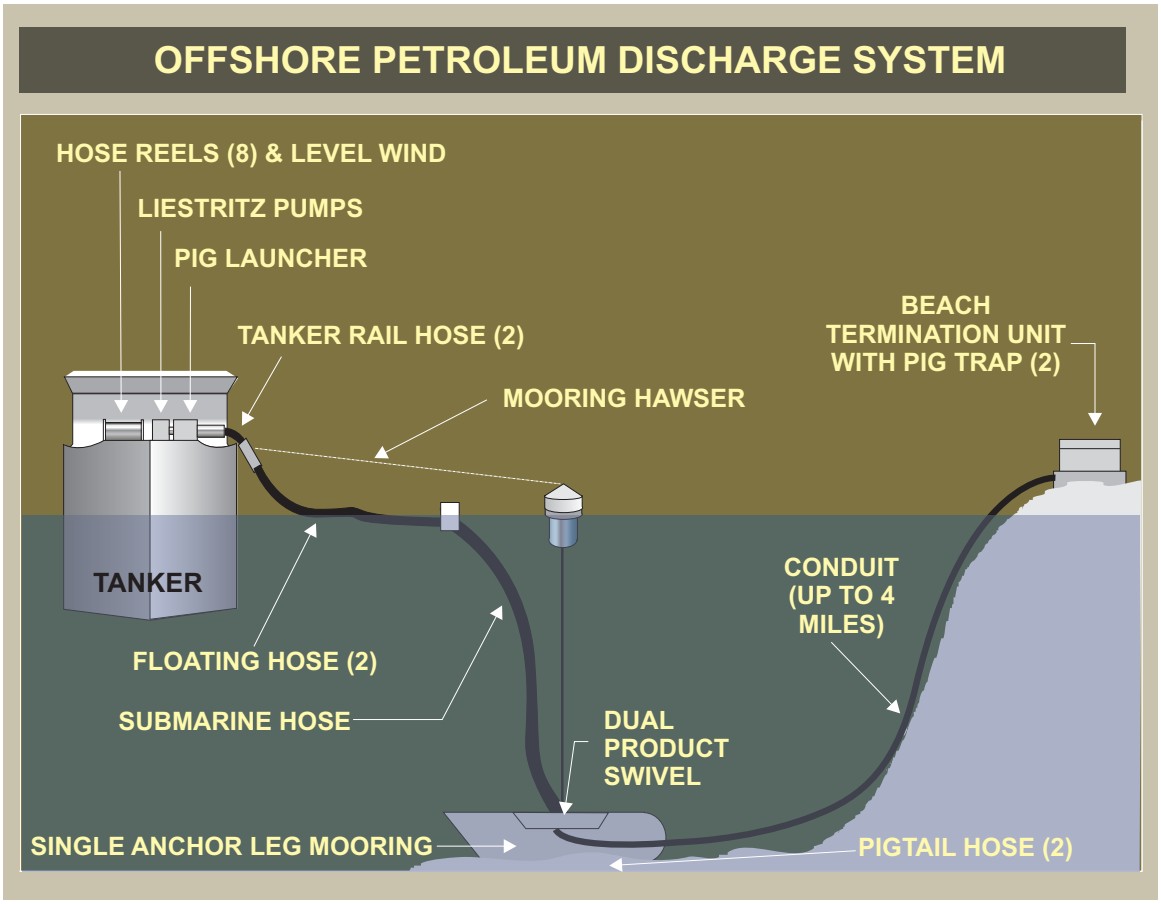


Figure XI-2. Offshore Petroleum Discharge System

still carry some of the necessary material for outfitting SLWTs to perform the OPDS deployment operations. The SS POTOMAC carries one complete tanker but is not large enough to accommodate OUB storage racks or a 59 ton crane for deployment of OUB's or other OPDS heavy lifts and therefore relies on other assets to provide SLWT or OUB assistance. The maximum lift capability of SS POTOMAC is 10 tons.

(1) In addition to the tanker terminal components carried on board, each specially configured OPDS tanker carries the following.

(a) Eight hydraulically powered storage reels, each of which carries one-half nautical mile of 6-inch internal diameter steel reinforced elostomeric conduit.

(b) Powered storage reels for other terminal hoses and for their repair.

(c) Skid beams to transport, launch, and recover the 800-ton SALM. Each beam has its own hydraulically powered linear puller and control system.

(d) One hydraulic power unit for OPDS equipment and special air compressors.

(e) Two high pressure cargo pumps, each capable of delivering 500 GPM at 740 pounds per square inch (psi) at the tanker rail.

(f) Two mooring-towing winches aft for use in placing the ship in a four-point spread mooring.

(g) Crane and stowage cradles for five OUBs (modified LCM-6s).

(2) The mobile tanker terminal consists of the following subassemblies.

(a) Four nautical miles (24,320 feet) of conduit. The conduit floats when air filled, and sinks when filled with refined product or water.

(b) A SALM type of SPM complete with floodable base, mooring buoys, and hoses to connect it to the rest of the terminal. The SALM product swivel permits pumping two products simultaneously from a tanker that may be rotating around the swivel because of currents and winds.

(c) Two BTUs which anchor the beach end of the conduit, control downstream pressure, and purge the conduits.

(d) Details of OPDS tankers and tanker terminals are found in a series of eleven manuals listed in Appendix O, "References."

c. **OPDS Capabilities and Parameters**

(1) Deliver 1.2 million gallons (28,600 barrels) at 1000 GPM of refined product per 20-hour day from a tanker up to 4 miles offshore through one flow line, or two products simultaneously at 500 GPM each if within 2 miles of the beach. The remaining 4 hours are for maintenance.

(2) Operate for at least 180 days with replenishment from supply tankers.

(3) Operate in sea state 5, survive in sea state 7, and remain on station in winds of 55 knots and current under 4 knots.

(4) Be installable in all bottom types except rock and hard coral in water depths from 35-190 feet (250 feet maximum for conduit). Installation is limited by sea state, wind, currents, and watercraft capability.

(5) The terminal (SPM) components are common, and may be used by any OPDS tanker with only 4 hours for tanker changeout.

(6) The tanker can recover and backload the terminal and transport it to another location at best tanker speed.

d. **OPDS Procedures, Organization, and Responsibilities.** The deployment, operation, and maintenance of OPDS involves both military and civilian organizations, but may be best understood if divided into tanker operations and terminal operations. The tanker operations are conducted by the tanker Master, who retains responsibility for the safety of the ship and all onboard equipment operations. The tanker terminal operations, including deployment, maintenance, and recovery of SALM and conduit, are the responsibility of the NBG, which usually delegates these tasks to the PHIBCBs and UCTs. The PHIBCBs control and operate OPDS support vessels, OUB's, UCT divers, and beach elements of the PHIBCBs. A specially trained PHIBCB OIC is designated to coordinate operations between the tanker, various beach group elements, and supported forces ashore which receive the fuel. A minimum of three OUBs configured as towing tugs, and one additional OUB configured as a lay-repair barge, are used to install the tanker terminal. The sequence of installation may be modified somewhat to take advantage of differences in physical environment and the need for initial operating capability. A fifth support OUB is outfitted as a dive boat to support diving operations. The OUBs assist the tanker in moving to a spread mooring for conduit deployment, and then deploy the conduit and BTUs to give a capability to pump ashore within 48 hours of tanker arrival. The spread mooring is an expedient to meet the required deployment schedule, and is not an all weather mooring, however, weather permitting, the entire cargo can be pumped off from the four point moor. Immediately after pumping begins, the support vessels deploy the SALM to permit all weather pumping through the SPM within 7 days of tanker arrival. In the event that the 48 hour pumping requirement is waived, all weather pumping through the SPM may be started 4 to 5 days after tanker arrival.

e. **OPDS Manpower Requirements.** Overall personnel requirements for OPDS installation and retrieval include the tanker crew, amphibious construction battalion (ACB)/OUB crews, divers, and SLWT crews. Military personnel are provided to the supported JFC from the supporting PHIBCB and UCT. Installation of OPDS is very labor and time intensive, requiring a major portion of abundant PHIBCB personnel and equipment assets. The JLOTS commander must be aware that these assets will not be available for other JLOTS operations while OPDS is being installed.

(1) **Civilian Personnel.** The tanker Master may be assisted by a team of OPDS specialists that could consist of technical representatives and program management personnel provided by Naval Sea Systems Command (NAVSEA), Maritime Administration or the Navy, however, the Master and crew are responsible for all operations that occur inside the rail of the tanker.

(2) **Military Personnel.** The Navy component commander will provide personnel from the support PHIBCB and UCT. The JLOTS commander provides an OPDS OIC who directs all OPDS installation that occurs outside the tanker rail. The JLOTS commander must also provide sufficient divers, OUB and/or OUB crews for installation and recovery of the conduit, SALM, and BTU. Additional personnel will also be required for beach support and BTU installation.

f. **Petroleum Systems Interfacing.** The Navy component has the responsibility for installation of the bulk fuel system to the beach termination unit; Marine Corps and/or Army forces have the responsibility for installation of the terminal and distribution system inland. It is likely that a Marine Corps AAFS will be installed in conjunction with the amphibious operations. Initially, interfacing with the Navy ABLTS, the Marine Corps IPDS consists of bag storage assemblies and associated hoses. As theater operations mature and distribution requirements become more widespread, the Army IPDS will normally be installed to provide necessary theater-wide fuel support. An Army component element, either the petroleum and water group or the petroleum operating battalion supervises the installation of IPDS by a petroleum pipeline and terminal operating company on the inland side of the OPDS BTU and the Army's TPT beach interface unit. If required, the OPDS tanker can provide afloat storage until the Army IPDS is fully developed. It also provides reserve storage to augment Marine Corps and Army fuel storage tanks and provides a surge capability, if required. During offshore and onshore installations, coordination between the Service components must be continuous to ensure logical timing of installations and proper location of the interfacing equipment at the beach.

g. **Marine Corps Fuel Systems.** The Marine Corps AAFS is normally employed to receive bulk fuel over the beach for storage and use ashore in support of the Marine Corps amphibious assault and MPF operations. The major components of the AAFS are: one beach unloading assembly, two booster pump assemblies, five tank farm assemblies (120,000-gallon capacity each), and dispensing assemblies. AAFS is capable of receiving fuel from ship-to-shore at a rate of 1,250 GPM and delivering bulk fuel by hose for a distance of 3 miles over relatively level ground. The system is installed and operated by the Bulk Fuel Company, Engineer Support Battalion of the force service support group (FSSG).

h. **Army Fuel Systems.** The Army fuel system used in association with JLOTS operations is the IPDS. The senior Army petroleum element is responsible for, and will coordinate with, the Navy petroleum element. This joint Army-Navy coordination will establish offshore discharge operation and inland petroleum distribution interface details on day-to-day procedures, fuel delivery schedules, quality surveillance, and custody transfer requirements for the actual bulk petroleum transferred to the pipeline and terminal operating company at the base terminal of the IPDS. IPDS consists of three components: the tactical petroleum terminal or fuel unit; mainline pumping station; and pipeline. IPDS is maintained as operational project stocks (not unit equipment) stored in 20-foot ISO containers.

i. **Tactical Petroleum Terminal Fuel Unit.** TPT is a bulk petroleum storage system. It serves as a storage terminal in an undeveloped theater. It can be used in the developed theater to supplement existing terminals that are inadequate or damaged. The system can receive fuels at rates up to 800 GPM and has a 3.78 million gallon storage capacity. The TPT requires nearly 40 acres of unobstructed land for installation and operation. The major components of the TPT are as follows.

(1) Eighteen bulk fuel tank assemblies, each with a capacity of 5,000 barrels (210,000 gallons). To provide more flexibility, the TPT has been configured into three fuel units, each consisting of six bulk fuel tank assemblies and assorted hardware. Each occupies approximately 15 acres when emplaced.

(2) Fifteen trailer-mounted 600-GPM pumps.

(3) Beach interface unit.

(4) Fire suppression system.

(5) Associated valves, manifolding, and 42,000 feet of hoseline to connect the terminal for efficient fuel movement into and out of the terminal.

j. The fuel from the base terminal (TPT or fuel unit) is carried inland via coupled aluminum pipeline as far forward as the corps rear area with spurs to high-volume customers such as airbases. The pipeline consists of 19-foot sections with an inside diameter of 6 inches and is configured into 5-mile sets with supporting valves, fittings, and gap crossing equipment. The fuel is moved to intermediate or head terminals by the mainline pumping station, each consisting of two 800 GPM pumps operating in parallel (one on stand-by) at 740 psi.

k. **Liquid Cargo Barges.** To supplement the above capabilities, the Army and Navy can arrange for liquid cargo barges to be available for moving bulk petroleum products from ship-to-shore. These barges can be used to

(1) Remove fuel from a ship when it is too heavily loaded to permit movement to the mooring because of draft limitations.

(2) Move fuel to the shore to supplement OPDS movements.

(3) Move fuel from the tanker for delivery using inland waterways.

5. Tactical Water Systems

Certain scenarios, particularly arid environment operations, may require the delivery of bulk potable water to storage and distribution systems ashore. In an immature theater, water can be obtained from surface sources (seas, rivers/streams, lakes) and treated with ROWPUs, subsurface sources (through wells), or from MPF ships over-the-shore through the ABLTS water hosereels. Each MPF ship (except the MPF(E) ships) carries one 10,000 foot reel of 4" water hose which are installed and operated by the PHIBCBs. The water-on-shore storage and distribution systems will consist of at least one 800,000-gallon system (or appropriate segment) operated by a quartermaster (QM) water supply company (TOE 10-468L). Water can then be moved away from the beach with a Tactical Water Distribution System (TWDS) (TOE 10-470LG) and/or semitrailer-mounted fabric tanks (TOE 55-018) (see Figure XI-3).

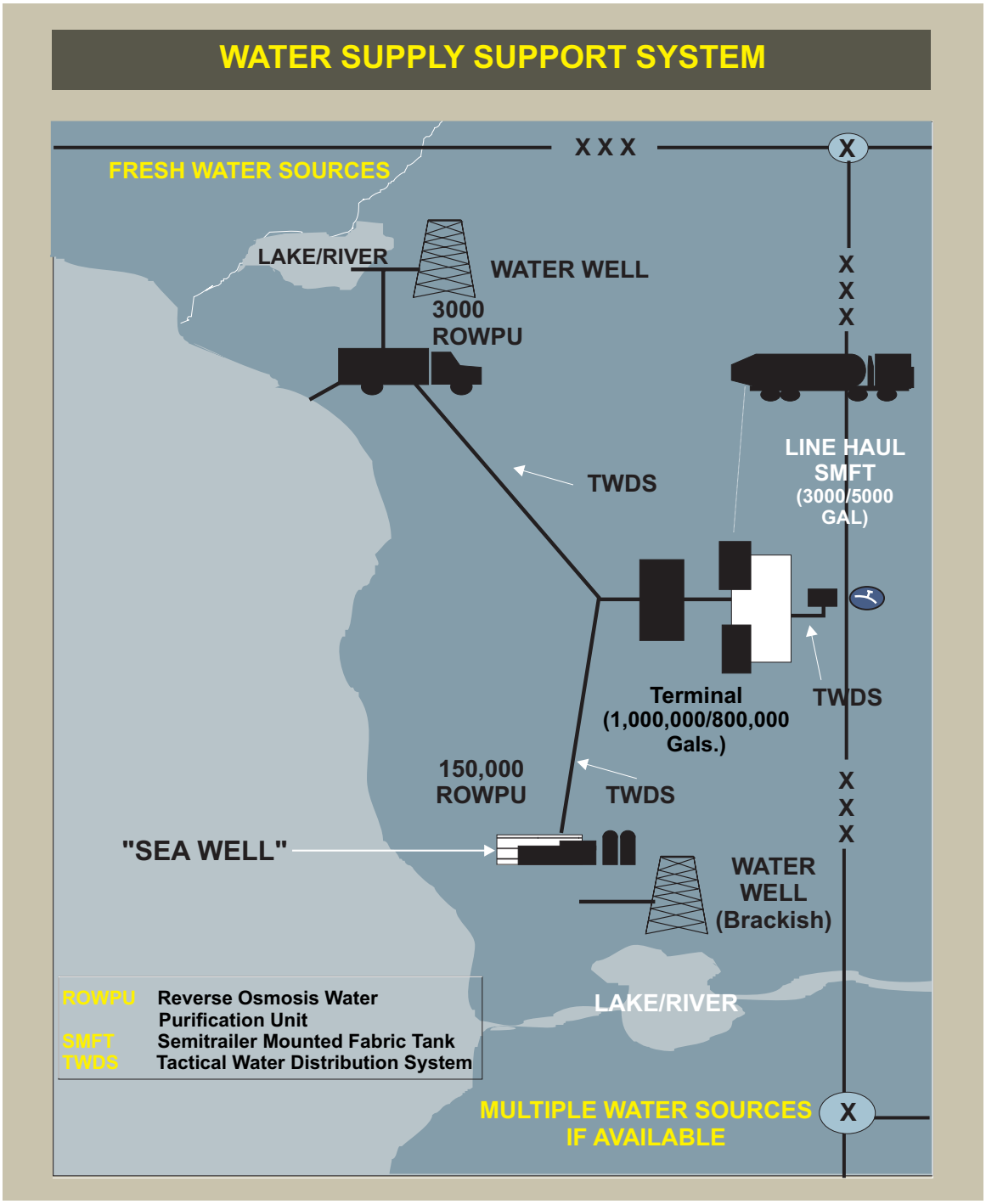


Figure XI-3. Water Supply Support System

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APPENDIX A
PLANNING FACTORS

1. Overview

a. Planning, the emphasis given to it, and the considerations inherent in the planning process are critical to the success or failure of a LOTS and/or JLOTS. Throughout the main text, planning considerations have been discussed. This appendix highlights some specific planning factors and items that are fundamental for the successful conduct of JLOTS operations. Throughput, container handling, breakbulk handling, RO/RO, barge, and NCHF planning factors are presented.

b. Most planning factors provided in this appendix are representative figures; i.e., neither optimum nor worst case. The factors came from test demonstrations such as the JLOTS II and JLOTS III tests; references are cited in Appendix O, "References." Additional data were supplied by the Chief of Naval Operations Strategic Sealift Division (OP-42) and from the US Army Transportation School at Fort Eustis, Virginia. Average distance offshore for shipping to be offloaded was assumed to be 2 miles.

2. Planning Considerations

a. **Load Planning.** Each ship participating in the LOTS operation requires a well conceived offload plan. Subservient plans, such as crane lift plans for each hold, should be prepared from the basic offload plan. The offload plan requires execution from the designated command center such as the OCO or LCC.

(1) **Offload Assumptions.** The following are specific offload assumptions used in developing offload plans.

(a) Naval personnel and equipment will be initially available in conducting the offload. Navy personnel may be phased out as the operation is transferred to Army control.

(b) In offloading RO/RO ships, the Service(s) owning the embarked vehicles must provide the vehicle drivers, who are not assigned duties as LOTS personnel. Some vehicles, such as construction equipment, might require specialized operators to offload.

(c) Throughput planning factors are degraded in conditions that exceed 20-knot winds and 3-foot seas.

(d) LASH or SEABEE barges will be offloaded at an ELCAS or at pierside. Load planning must consider the need for an operational ELCAS in prioritizing LASH or SEABEE ship loads. Emergency offload of LASH or SEABEE barges to lighterage could be carried out by a T-ACS.

(e) Vehicles will be offloaded from an RRDF to CFs, LSVs or LCUs or by lift-on and roll-off from breakbulk or modified containerships to lighterage.

(f) Crane cycle times will be considered the critical point in offload productivity. Sufficient auxiliary equipment such as lighterage and transport equipment will be necessary to achieve the planned throughput.

(g) Over sustained operations and based on experience and equipment manual data; additional time should be programmed in JLOTS planning for system preventive maintenance.

(2) **Personnel Considerations.** The inclusion of the following personnel should be considered for the successful execution of JLOTS operations.

(a) Double shift crews must be available for CF and certain other lighter operations to permit around-the-clock offloading of unit equipment and cargo. In addition, an adequate number (two shifts) of T-ACS crane operators, containership hatch teams, C2 personnel, and vehicle drivers must be available to ensure efficient JLOTS operations.

(b) Crews required for major system installation (ELCAS, RRDF, and other systems) will be available for doubleshift operations following installation of those systems.

(c) Personnel requirements for LASH or SEABEE barge offloading are

1. The cargo transfer company, port operations cargo detachment (POCD), or NCHF is responsible for unloading if it is done by T-ACS.

2. The PHIBCB is responsible for unloading if it is done at the ELCAS.

3. Participating Services must provide stevedore support in both cases.

(3) **Lighterage Repair and Fueling Capability.** An adequate number of appropriately trained personnel must be available to provide around-the-clock capability to repair damaged lighterage and conduct fueling and/or de-fueling operations.

(4) **Logistic Support.** In the JLOTS operation area, logistic support of personnel participating in JLOTS operations is normally a Service responsibility. The OPORD for the JLOTS operation should specify any deviations from standing operating orders and/or special requirements and responsibilities for the provision of messing, billeting, supply (including bulk fuel for JLOTS equipment and offloaded vehicles and/or equipment), maintenance, and health service support.

b. **Offloading Site Selection.** Site selection and preparation is just as important to the success of JLOTS operations as equipment preparation. Considerations include the nearness of the staging area, gradient, beach width, surf observations, and surveys for tides, currents, or sandbars. Expected anchorage sites for both ships and major JLOTS equipment must be considered in selecting the landing site. A typical offload discharge site is depicted in Figure I-1.

c. **Anchorage Selection.** The following planning data are used for anchorage at a JLOTS site.

(1) **Depth.** For cargo ships, a minimum water depth of 6 fathoms (i.e., 36 feet) is required.

(2) **Size.** Adequate safe sea room must be provided for ships to enter and depart the JLOTS site as well as swing at anchor. An anchorage area should be established using anchorage diameter, depth of water, and length of vessel.

d. **System Preparation Time.** Various preparation times for JLOTS systems required for offload are shown in Figure A-1.

3. Throughput Planning Factors

a. Throughput planning factors have been established for the lighterage systems used in JLOTS based on exercise demonstrations such as JLOTS tests. Sustained throughput factors were calculated using neither optimum nor worst-case scenarios, but are representative of achievable integrated offload. Throughput is based on times necessary to execute the events of a LOTS operation. Such events may include the following.

(1) Cast off and clear time from the beach.

(2) Transit time to the ship.

(3) Approach and moor time at the ship.

(4) Number of discharge points.

SHIP OFFLOAD PREPARATION TIMES[1/]

SYSTEM	TIMES
T-ACS	10 Hours[2/]
Containerships mooring to T-ACS	2 Hours (with tugs)
Breakbulk ship	2 Hours
RRDF Assembly	6-8 Hours (SS)[3/]
RRDF Positioning alongside ship	2-1/2 Hours (SS)[3/]
RRDF Removal	1 Hour
LASH Ship	1 Hour
SEABEE Ship	1 Hour

1/ Most ship preparation should be done prior to dropping anchor.
2/ 10 hours to offload lighterage and then begin general cargo discharge.
3/ SS indicates self-sustaining RO/RO ship.

Figure A-1. Ship Offload Preparation Times

(5) Load time at the ship.

(6) Cast off and clear time from the ship.

(7) Transit time to the beach.

(8) Approach and moor time at the beach.

(9) Offload time at the beach.

(10) Clearance time for JLOTS operations area.

b. Another factor that determines the throughput rates is the capability of the lighterage; i.e., cargo type carried or weight capacity. Figure A-2 depicts various throughput planning factors. Values summarized here are for general planning and are derived from calculations based on data contained in subsequent tables in this appendix. Additional lighterage characteristics can be found in Appendix B, "Lighterage Characteristics."

(1) **Lighterage Planning Factors.** The information in Figure A-2 is based on the expected effective operating speed of loaded lighterage in calm water and provides typical lighterage transit times. It includes lighterage maneuvering and/or beaching time. These events include "approach and moor" and "cast off and clear".

(2) **Lighterage Interface Capability.** The effective interface of multiple types of lighterage with various LOTS discharge systems and/or ships will determine throughput rates. Figures A-3 and A-4 show a prioritized match of lighterage with various ships or discharge systems for the offload of vehicles, containers, and breakbulk cargo.

NOTE: The CF is referred to as CSP +1, 2, and 3, DWMCF, and CF. Unless otherwise stated, the following tables use the abbreviation CF. The floating causeway pier is referred to as the floating causeway (FC), following current usage. The FC will be employed when the LSV and LCU -1600 and -2000 are operating on gentle or flat beach gradients. All lighters can discharge directly to a bare beach in steep and moderate beach gradients. All productivity is based on a two 10-hour shift, 20-hour workday. Operations are in sea state 2 and below with all JLOTS systems considered as having full operating capability.

DISCHARGE PLANNING FACTORS

Lighter Load Planning Factors

	20-Foot Containers[1/]	40-Foot Containers[1/]	Wheeled Vehicles	Tracked Vehicles[2/]
CF[3/]	24	12	16	1 per 80 or 90 foot causeway module
DWMCF[4/]	35	18	Data not available	Data not available
LCU-1600	4	3	4[5/]	2
LCU-2000	7	2	13	5
LSV	25	15	50	24

1/ Containers are single stacked. LCUs and LSV in intracoastal transportation role can stack containers two high, thus doubling the number carried.
2/ M1A1/A2 main battle tank.
3/ Maximum rated capacity is 90 to 100 short tons per causeway module.
4/ DWMCF is configured to carry 40-foot containers and not rolling stock. Vehicle planning factors are not available.
5/ An LCU-1600 can carry (13) HMMWVs, (6) 5-ton/MTVR trucks, or (7) LAV-25s for example.

T-ACS Crane Cycle Time[1/]
(Minutes: Seconds to load containers based on the number of cranes used)

1 Crane	1 container is loaded every 7:29 minutes. 24 containers are loaded in approximately 3 hours.
2 Cranes	2 containers are loaded every 10:36 minutes. 24 containers are loaded in approximately 2 hours and 7 minutes.
3 Cranes	3 containers are loaded every 16:42 minutes. 24 containers are loaded in approximately 1 hour and 56 minutes.

1/ JLOTS II test data.

Figure A-2. Discharge Planning Factors

DISCHARGE PLANNING FACTORS (cont'd)

Wheeled Vehicle Discharge Planning Factors[1/]
Watercraft Cycle Times for LO/RO Discharge (all times in hours: minutes)

Craft	Load	C&C Beach	C&C FC	A&M Ship	Load	C&C Ship	A&M Beach	A&M FC	Unload Beach	Unload FC	1 mile	2 miles	3 miles	4 miles	5 miles
CF	16	00:04		00:12	03:41	00:04	00:05		00:28		05:02	05:30	05:58	06:26	06:54
LCU 1600	4	00:02		00:14	00:57	00:03	00:01		00:08		01:41	01:57	02:13	02:29	02:45
LCU 2000	13		00:07	00:11	02:30	00:04		00:12		00:30	03:50	04:06	04:22	04:38	04:54
LSV	50		00:07	00:22	07:53	00:05		00:13		01:33	10:27	10:41	10:55	11:09	11:23

1/ JLOTS III test data.
LO/RO = Lift-on/Roll-off

Wheeled Vehicle Discharge Planning Factors[1/]
Watercraft Cycle Times for RO/RO Discharge (all times in hours: minutes)

Craft	Load	C&C Beach	C&C FC	A&M RRDF	Load	C&C Ship	A&M Beach	A&M FC	Unload Beach	Unload FC	1 mile	2 miles	3 miles	4 miles	5 miles
CF	16	00:04		00:34[2/]	01:38	00:23[2/]	00:05		00:28		03:40	04:08	04:36	05:04	05:32
LCU 1600	4	00:02		00:06	00:26	00:02	00:01		00:08		01:01	01:17	01:33	01:49	02:05
LCU 2000	13		00:07	00:09	01:33	00:04		00:12		00:30	02:51	03:07	03:23	03:39	03:55
LSV	50		00:07	00:09	05:50	00:07		00:13		01:33	08:13	08:27	08:41	08:55	09:09

1/ JLOTS III test data.
2/ Approximately 20 minutes is added to approach and moor and cast-off and clear for unflexing and flexing at the RRDF.

Figure A-2. Discharge Planning Factors (cont'd)

DISCHARGE PLANNING FACTORS (cont'd)

Tracked Vehicle Discharge Planning Factors[1/]
Watercraft Cycle Times for RO/RO Discharge (all times in hours: minutes)[2/]

Craft	Load	C&C Beach	C&C FC	A&M RRDF	Load	C&C Ship	A&M Beach	A&M FC	Unload Beach	Unload FC	1 mile	2 miles	3 miles	4 miles	5 miles
CF	3	00:04		00:34[3/]	00:21	00:23[3/]	00:05		00:09		02:04	02:32	03:00	03:28	03:56
LCU 1600	2	00:02		00:06	00:13	00:02	00:01		00:02		00:42	00:58	01:14	01:30	01:46
LCU 2000	5		00:07	00:09	00:34	00:04		00:12		00:12	01:34	01:50	02:06	02:22	02:38
LSV	24		00:07	00:09	02:27	00:07		00:13		00:58	04:15	04:29	04:43	04:57	05:11

1/ JLOTS III test data for M1A1/A2 main battle tank.
2/ Tracked vehicles can be lifted off using ships' gear or floating cranes, but this is the least productive method of discharge. In this case, discharge times will vary based on the type of tracked vehicle being handled.
3/ Approximately 20 minutes is added to A&M and C&C for unflexing and flexing at the RRDF.

Figure A-2. Discharge Planning Factors (cont'd)

DISCHARGE PLANNING FACTORS (cont'd)

Container Discharge Planning Factors[1/]
Watercraft Cycle Times for T-ACS Discharge Using 1 Crane (all times in hours: minutes)

Craft	Load	C&C ELCAS	A&M T-ACS	Load T-ACS	C&C T-ACS	A&M ELCAS	Unload ELCAS	1 mile	2 miles	3 miles	4 miles	5 miles
LCU 1600	4	00:02	00:10	00:30	00:02	00:08	00:36	01:44	02:00	02:16	02:32	02:48
LCU 2000	7	00:07	00:11	00:52	00:04	00:10	01:03	02:43	02:59	03:15	03:31	03:47

1/ JLOTS II and III test data for container operations.

Container Discharge Planning Factors[1/]
Watercraft Cycle Times for T-ACS Discharge Using 2 Cranes (all times in hours: minutes)

Craft	Load	C&C ELCAS or Pier	A&M T-ACS	Load T-ACS	C&C T-ACS	A&M ELCAS or Pier	Unload ELCAS or Pier	1 mile	2 miles	3 miles	4 miles	5 miles
CF	24	00:03	00:12	02:07	00:03	00:10	03:36	06:39	07:07	07:35	08:03	08:31
LSV[2/]	25	00:07	00:13	02:15	00:07	00:16	03:45	06:57	07:11	07:25	07:39	07:53

1/ JLOTS II and III test data for container operations.
2/ LSV is most productive when discharged pierside in a fixed port using port cranes or at an FC with a mobile crane and/or container handler.

Container Discharge Planning Factors[1/]
CF to Beach Cycle Times for T-ACS Discharge Using 2 Cranes (all times in hours: minutes)[2/]

Craft	Load	C&C Beach	A&M T-ACS	Load T-ACS	C&C T-ACS	A&M Beach	Unload Beach	1 mile	2 miles	3 miles	4 miles	5 miles
CF	24	00:04	00:12	02:07	00:03	00:05	02:00	04:59	05:27	05:55	06:23	06:51

1/ JLOTS II and III test data for container operations.
2/ Assumes container handling equipment is available in quantities sufficient to meet beach unloading time.

Figure A-2. Discharge Planning Factors (cont'd)

DISCHARGE PLANNING FACTORS (cont'd)

Lighter Selection Based on Cargo Category and Miles From Shore

Wheeled Vehicles (RO/RO)	Tracked Vehicles (RO/RO)	Twenty-foot Containers (LO/LO)	
1 to 5 miles	1 to 5 miles	1 mile	2 to 5 miles
LSV	LSV	CF	LSV
LCU-2000	LCU-2000	LSV	CF
CF	LCU-1600	LCU-2000	LCU-2000
LCU-1600	CF	LCU-1600	LCU-1600

Figure A-2. Discharge Planning Factors (cont'd)

Note: This next figure is a sample which shows the optimum mix of watercraft per discharge point or lane based on the cargo category being moved. Optimizing watercraft utilization is best accomplished using the Joint Over-the-Shore Transportation Estimator (JOTE) model. The JOTE model input is the number and type of craft available, amount and type of cargo to be discharged (in ST), number of lanes or loading points to be used, and the average time that the sea state is 2 or below. The model output identifies the number and type craft used in an operation, how many round trips are made, throughput attained (in ST) and cargo remaining to be discharged. Variations in daily throughput can be determined by changing the number and mix of watercraft available, increasing or decreasing the number of lanes or loading points, and increasing or decreasing the amount of time conditions are sea state 2 or below.

DISCHARGE PLANNING FACTORS (cont'd)

Notional Watercraft Optimization[1/]
Type and Number of Lighters Needed at a Single Loading Point
for Maximum Cargo Throughput in a 20 Hour Day at 1 Mile from Shore

Wheeled Vehicles (RO/RO)		Tracked Vehicles (RO/RO)		Twenty-foot Containers (LO/LO)	
Craft (Round Trips)	Piece Count	Craft (Round Trips)	Piece Count	Craft (Round Trips)	Piece Count
1 LSV (2)	100	1 LSV (5)	120	CF (1 [3], 2 [2])	167
2 LCU-2000 [1 (2), 1 (1)]	39	2 LCU-2000 (4 ea.)	40		
1 LCU-1600 (1)	4				
Total pieces	143		160		167

1/ Optimization using the JOTE model is based on full utilization of the RRDF and crane loading points. For example, a loading point is occupied during the time a lighter is maneuvering to approach and moor, being loaded, and then maneuvering to cast off and clear. As the first lighter completes the C&C manuever, the second lighter begins to approach and moor. Maximum daily throughput is achieved by first determining the most productive lighter for a particular operation and then selecting other lighters than can fill in the time when that more productive craft is away from the RRDF or crane. In the two RO/RO examples we see only 1 LSV assigned to a single discharge lane. This is done to avoid any waiting to load or idle time for the LSV. However, in the case of the LO/LO container example it is better to use multiple CFs than to employ a combination of CFs and an LSV at 1 mile. Since the LSV is overall the most productive JLOTS lighter, it should not remain idle or waiting to load when other capable craft are available.

Figure A-2. Discharge Planning Factors (cont'd)

LIGHTER, CARGO, AND SHIP INTERFACE COMPATIBILITY				
	Lighter	Containership and T-ACS	Breakbulk Ship	RO/RO Ship
Vehicles[1/]	CF	Good	Good	Optimal
	LCUs	Good	Good	Optimal
	LSV	Optimal	Optimal	Optimal
Containers	CF	Optimal	Optimal	Optimal
	LCUs	Good	Good	Good
	LSV	Optimal	Optimal	Optimal
Breakbulk[2/]	CF	N/A	Good	Good
	LCUs	N/A	Optimal	Optimal
	LSV	N/A	Good	Good
1/ Vehicle category includes both wheels and tracks, with wheeled vehicles being counted as either a single unit or separate prime mover and trailer. 2/ Breakbulk ship discharge is the least efficient JLOTS cargo transfer mode. Breakbulk ships are being phased out. The LCU-1600 and -2000 are best suited for transporting breakbulk pallets due to the need for securing loads.				

Figure A-3. Lighter, Cargo, and Ship Interface Compatibility

LIGHTER, CARGO, AND BEACH DISCHARGE FACILITY COMPATIBILITY					
	Lighter	ELCAS[1/]	Fixed Port[2/]	Bare Beach[3/]	Floating Causeway[4/]
Vehicles	CF	Marginal	Good	Optimal	Marginal
	LCUs	Marginal	Good	Optimal	Optimal
	LSV	No capability	Good	Optimal	Optimal
Containers	CF	Good	Optimal	Optimal	Marginal
	LCUs	Marginal	Optimal	Marginal	Marginal
	LSV	No capability	Optimal	Good	Good
Breakbulk[5/]	CF	Good	Good	Optimal	Marginal
	LCUs	Good	Good	Optimal	Optimal
	LSV	No capability	Good	Optimal	Optimal
1/ LSV is too large to moor alongside the ELCAS. ELCAS crane capacity is 33.6 short tons. 2/ Use of fixed port facilities that are operational, but inaccessible to strategic sealift ships, offers most efficient method for discharging lighters carrying lift-off cargo. 3/ All JLOTS lighters operate optimally on steep and moderate beach gradients. When beach gradients become gentle or flat, only the CF has full beaching capability. The LSV and LCUs will employ floating causeway piers under these conditions. Forty-foot containers will not routinely be discharged at the beach unless loaded aboard DWMCF. 4/ CF and FC are least compatible lighter and cargo transfer platform. FC was designed to accommodate LCUs and LSVs on gentle or flat beach gradients or as an administrative pier for JLOTS craft. 5/ Breakbulk cargo is most efficiently discharged from lighters using materials handling equipment.					

Figure A-4. Lighter, Cargo, and Beach Discharge Facility Compatibility

4. Container Handling and Transportation Planning Factors

This section presents demonstrated planning factors that can be used under favorable weather conditions to estimate offload times in a LOTS and/or JLOTS operation.

a. **Container Transfer Times.** Containers are transferred from lighterage to beach clearance vehicles by the handling equipment operating at a particular site. The ELCAS (M) uses a minimum 175-ton crane. One crane operates at each lighterage berth. Two RTCHs operate as a team to unload CFs at each berth of the RTCH site. The container transfer time in a marshalling yard is shown in Figure A-5. Trucks arriving in a marshalling yard are generally unloaded by RTCHs. The expected time to unload trucks (per container) is given below.

b. **ELCAS Container Discharge Rates.** Figure A-6 displays lighterage requirements to maintain various container discharge rates over a double pierhead ELCAS.

c. **Truck Transit Times.** These transit times include the time to secure the container load on the truck exiting the beach area, including brief stops for cargo documentation functions and to travel approximately 1 mile to a marshalling yard. Figure A-7 lists the expected times. If the transit distance is longer, additional time should be calculated at 10 miles per hour unless road and vehicle conditions are known to permit higher speeds or require lower speeds.

5. Breakbulk Handling and Transportation Planning Factors

Limited information is available on breakbulk handling times. The data gathered are limited to lighterage offloading and truck loading at the beach. Figure A-8 summarizes breakbulk lighterage offloading times. In general, breakbulk operations at the beach should not interfere with container operations.

6. RO/RO Throughput Planning Factors

a. **Loading and Discharging.** A mean load and discharge time for self-sustaining and non-self-sustaining RO/RO ships is summarized in Figure A-2.

b. **Vehicle Per Lighterage Trip.** The number of vehicles a lighter can carry depends upon the types of vehicles and the types of lighters used to carry the vehicles.

CONTAINER TRANSFER RATE IN MARSHALLING YARD (MINUTES PER CONTAINER)

SERVICE	20-FOOT	40-FOOT
MARINE CORPS	3	N/A
ARMY	2	3

Figure A-5. Container Transfer Rate in Marshalling Yard (Minutes Per Container)

CONTAINER DISCHARGE RATE AT ELEVATED CAUSEWAY SYSTEM				
TYPE OF LIGHTERAGE	RATE (Containers per hour)	LIGHTERAGE REQUIREMENTS (Miles Offshore)		
		1	2	3
LCU (4 containers)	8	3	4	4
LCU-1600 (4 containers)	12	4	5	5
LCU-2000 (8 containers)	16	5	6	6
	20	6	7	8
LCM (1 container)	4	2	3	3
Causeway Ferry				
(3 section)	8	2	3	3
	12	3	3	4
	16	3	4	4
	20	4	4	5
CSP powered Causeway Ferry	8	3	4	4
1+2	12	4	5	5
1+2	16	5	6	6
1+3	20	6	7	8

Figure A-6. Container Discharge Rate at Elevated Causeway System

TRANSIT TIMES AT THE BEACH TO MARSHALLING YARD	
TRUCK TYPE	TRANSIT TIME (Minutes)
Marine Corps 20-Foot	10
Army 20-/40-Foot	10-14

Figure A-7. Transit Times at the Beach to Marshalling Yard

BREAKBULK OFFLOAD AT BEACH	
LIGHTER	AVG TIME PER PALLET (Minutes)
LCU 1600	1.0
LCM-8	1.2
LSV	1.0

Figure A-8. Breakbulk Offload at Beach

c. **Daily RO/RO Throughput Planning Factors.** RRDF expected performance times have been used to calculate the projected 24-hour throughput for selected lighterage combinations and the results are tabulated in Figure A-2.

7. Naval Cargo Handling Force Discharge Rates

Various discharge rates achievable by the NCHF are in this section.

a. **NCHF Palletized Cargo Shipboard Discharge Rates.** NCHF rates are based on observed data.

(1) **Assumptions.** The following assumptions were used to determine pierside and in-stream operation palletized cargo throughput rates established by the NCHF.

(a) All cargo is palletized.

(b) Some delays are encountered because of mechanical difficulties.

(c) Requirement exists to open hatches or shift hatch covers.

(d) Seven stevedores are available to support each hatch team.

(e) Some cargo in each hold will require "snaking" or double handling to make it accessible to the forklift.

(f) Where lighterage is involved, some delays will be encountered because of lighterage moves.

(g) The sea state is not greater than 2.

(h) Yard and stay rigs are used.

(2) **Pierside Operation Factors**

(a) One pallet is offloaded every 4 minutes per hatch team.

(b) Eight hatch teams are working (two ships, four hatch teams per ship).

(c) Above means eight pallets are offloaded every 4 minutes (120 per hour).

(d) Two shifts, each working 12 hours, equal 24 hours.

(e) 24 x 120 = 2,880 pallets per battalion per day.

(3) **In-Stream Operations Factors**

(a) One pallet is offloaded every 6 minutes per hatch team.

(b) Eight hatch teams are working (two ships, four hatch teams per ship).

(c) Above means eight pallets are offloaded every 6 minutes (80 per hour).

(d) Two shifts, each shift working 12 hours, equal 24 hours.

(e) 24 x 80 = 1,920 pallets per battalion per day.

b. **NCHF Containerized Cargo Shipboard Discharge Rates.** NCHF rates are based on observed data.

(1) **Assumptions.** The following assumptions were used to derive these rates.

(a) Cranes are available to work four hatches simultaneously per ship.

(b) Containers will occasionally require respotting on truck or lighterage.

(c) Some delays are encountered because of mechanical difficulties.

(d) Time will be required to unlash or move containers within cells.

(e) Either a manual spreader or nylon slings with container lugs are used (mechanical spreader not used).

(f) Five stevedores are available to support each hatch team.

(g) For in-stream operations, some delays will be encountered because of lighterage moves.

(h) The sea state is not greater than 2.

(2) **Pierside Operations Factors**

(a) Four containers are offloaded per hour per crane.

(b) Eight hatch teams are working (two ships, four hatch teams per ship).

(c) Above means 32 containers are offloaded per hour.

(d) Two shifts, each working 12 hours, equal 24 hours.

(e) 24 x 32 = 768 containers per battalion per day.

(3) **In-stream Operation Factors**

(a) Three containers are offloaded each hour per crane.

(b) Eight hatch teams are working (two ships, four hatch teams per ship).

(c) Above means 24 containers are offloaded per hour.

(d) Two shifts, each working 12 hours, equal 24 hours.

(e) 24 x 24 = 576 containers per battalion per day.

8. Army Discharge Rates

Appendix M, "Unit Capabilities," contains Army discharge rates.

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APPENDIX B
LIGHTERAGE CHARACTERISTICS

1. Overview

Representative lighterage characteristics are provided as a planning tool for the conduct of JLOTS operations.

2. Characteristics and Capabilities

a. Nominal characteristics and capabilities for an entire class of lighterage are shown in Figure B-1. The purpose of providing this information is for use in planning these operations. Minor variations within a class of vessels exist and are not noted in the figure. For example, LCUs of the 1610 class were built in several different lots, by different manufacturers, in different years, which resulted in minor characteristic variations.

b. Figure B-1 is to be used for planning purposes only and not to be considered definitive for purposes of determining exact weights for crane lifts or for any other purpose in which safety may be affected. Exact weights and capacities may be determined by actual weighing or by examination of appropriate certification documents or operator or technical manuals.

c. Because of differences in organization, manning, and other factors, the same type of equipment may be used differently, crewed differently, or operated with different limitations and capabilities by the individual Services. For example, the figure shows that an LCM-8 is crewed by five people; another Service may use four or six in the crew. Such differences are not noted in Figure B-1.

d. Within the LCU-1610 class, LCUs 1627 and 1646 have been considered separate classes at various times. The Army refers to this class as the 1600 class.

e. Various lighterage classes are shown in Figure B-2. The LCAC is shown in Figure B-3, the LCU-2000 is shown in Figure B-4, and the LSV is shown in Figure B-5.

f. The Army has two classes of tugboats that are used to support barge operations and provide towing of watercraft, CWPs, and RRDFs. Additionally, they perform salvage and recovery operations for disabled lighterage, position floating cranes, accomplish fire fighting duties, and assist in maneuvering anchored strategic sealift ships to provide a lee for lighterage and RRDFs during operations in adverse weather. Tugboat availability is an integral part of the JLOTS Safe Haven and Salvage plans. The Large Tug 128', LT-800 class, is shown in Figure B-6 and the Small Tug 60', ST-900 class, is shown in Figure B-7.

REPRESENTATIVE LIGHTERAGE CHARACTERISTICS										
Class	**Capacity (stons)**	**Crew**	**Length**	**Beam**	**Draft (Full Load)**	**Speed**	**Troops**	**Cargo Area L x Max W (x Min W)**	**Light Displacement (tons)**	**Ramp (Width)**
LCU 1600	160.0	12	135' 3"	29' 0"	7' aft	12 kts lt	350[2/]	121'x25' (x 14')	191.5	Bow 14' Stern 18'
LCU 2000	350.0	12	175' 0"	42' 0"	5' fwd 9' aft	12 kts lt 10 kts full	350[2/]	100'x38'	550	16'
LSV	2000	29	273'	60'	12' fwd 16' aft	12 kts	900[2/]	160'x58'	4266	Bow 26' Stern 24'
LCM-8 (Steel)	65.0	5	73' 7"	21' 0"	3' 10" fwd 5' 2" aft	12 kts full	150	42'9"x14'6"	67	14'6"
LCM-8 (Alum.)	65.0	5	74' 3"	21' 0"	3' fwd 4' 8" aft	12 kts full	200	42'9"x14'6"	37.8	14'6"
CSNP	90.0	N/A	92' 0"	21' 0"	1' fwd 1' aft	N/A	N/A	92'x21'	70	N/A
CSP	35.0	6	85' 0"	21' 0"	1' fwd 2.8' aft	7 kts lt	N/A	60'x21'	88	N/A
SLWT	N/A	8	84' 0"	21' 0"	1.6' fwd 2.8 aft	7 kts lt	N/A	N/A	103	N/A
LARC-V	5.0	2	35' 0"	10' 0"	4' 1" fwd 4' 4" aft	9 kts water 29.5 mph land	20	16'x10'	10.5	N/A
LCAC	60.0[1/]	5	87' 11"	47' 0"	0-3'	40 kts full	24	71'x27'	99	Bow 27' Stern 15'

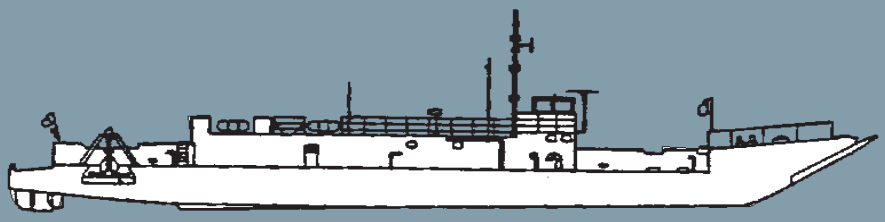
1/ Overload condition is 75 tons.
2/ While landing craft utilities are capable of carrying troops, this should only be done in extreme situations when the distance and time of travel are under 2 hours in sea states less than 2. These craft are not designed to transport troops in high sea state.

Figure B-1. Representative Lighterage Characteristics

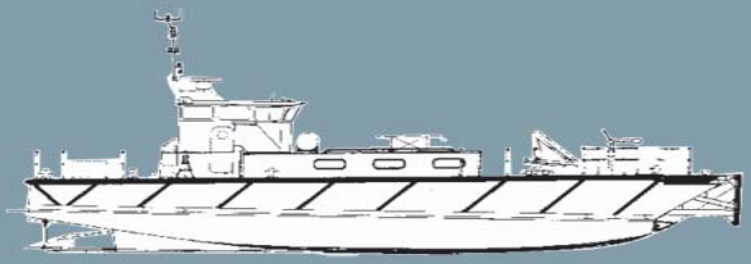
LIGHTERAGE AND FLOATING CRAFT



Landing Craft, Mechanized (LCM - 8)



Landing Craft, Utility (LCU-1600 Class)



Landing Craft, Mechanized (LCM - 8 Mod 2)



Lighter, Amphibious Resupply Cargo (LARC-V)

Figure B-2. Lighterage and Floating Craft

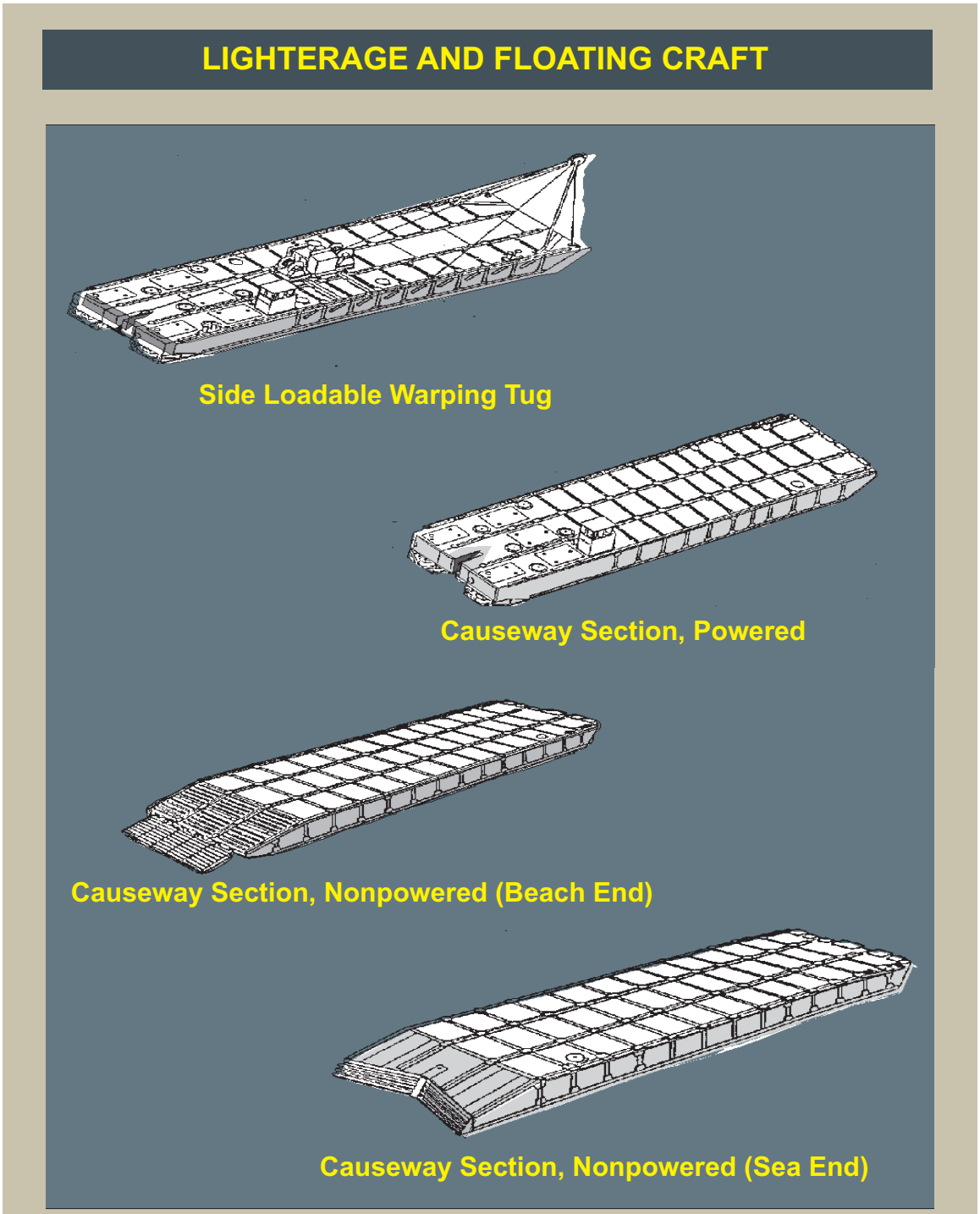


Figure B-2. Lighterage and Floating Craft (cont'd)

LANDING CRAFT, AIR CUSHION

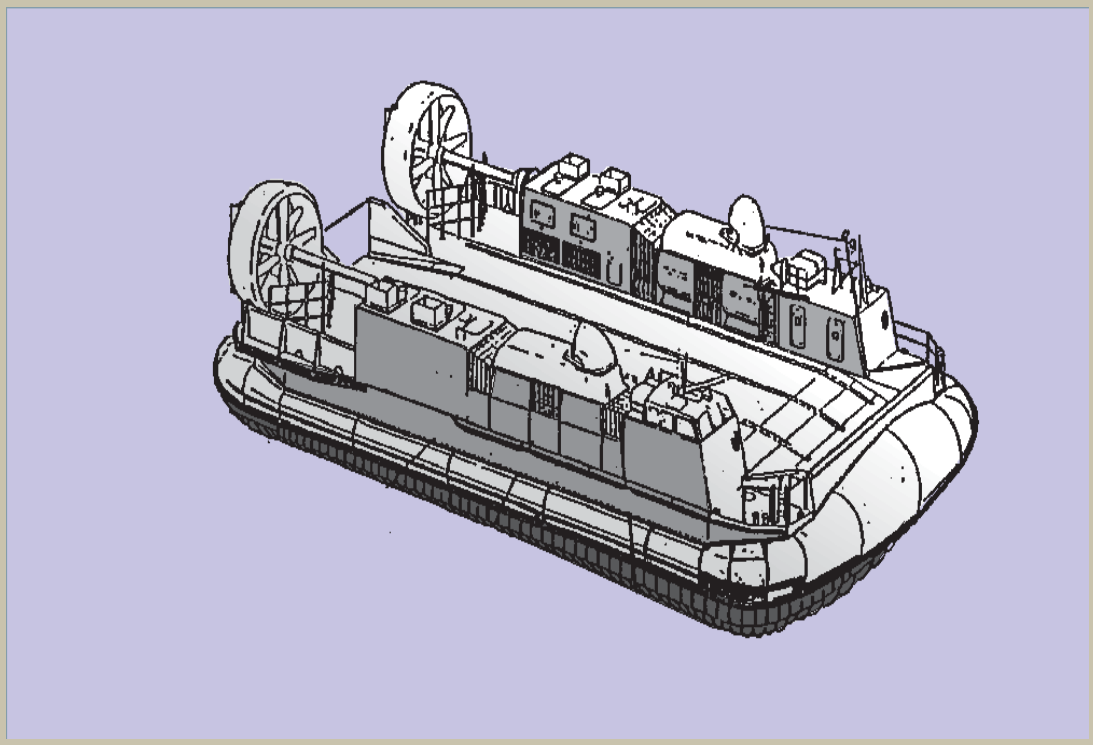


Figure B-3. Landing Craft, Air Cushion

LANDING CRAFT UTILITY-2000 CLASS

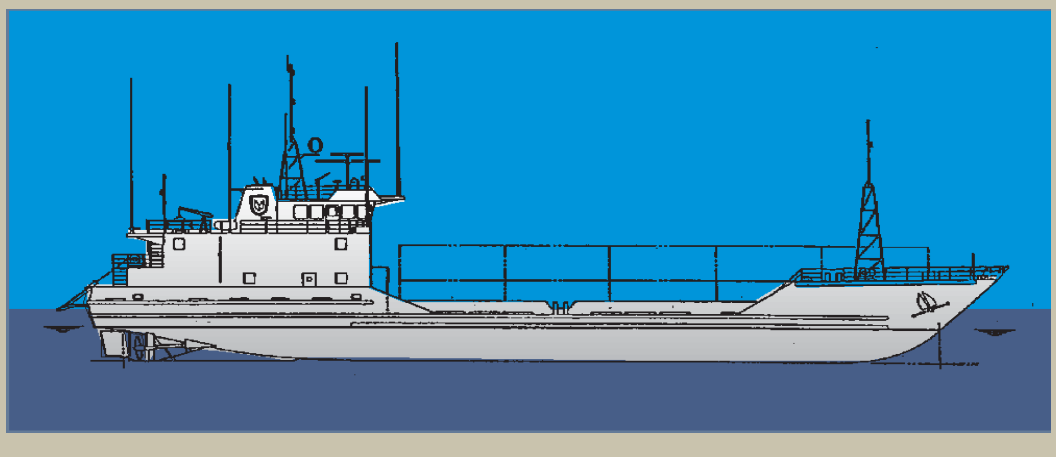


Figure B-4. Landing Craft Utility-2000 Class

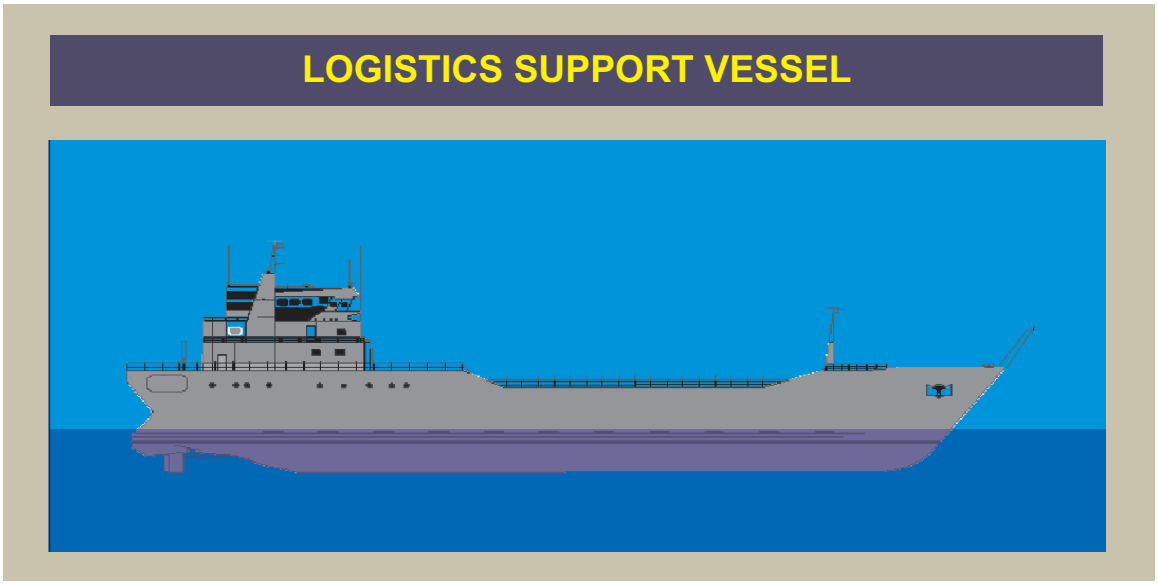


Figure B-5. Logistics Support Vessel

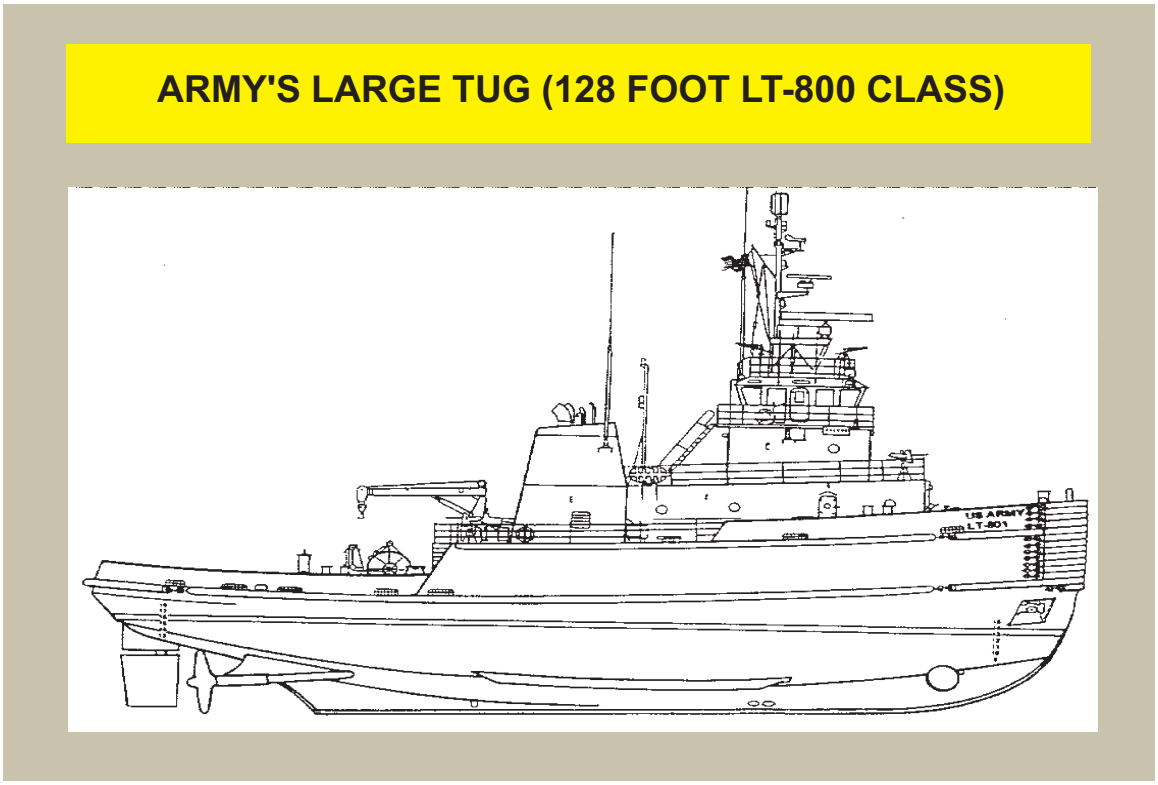


Figure B-6. Army's Large Tug

ARMY'S SMALL TUG
(60 FOOT ST-900 CLASS)

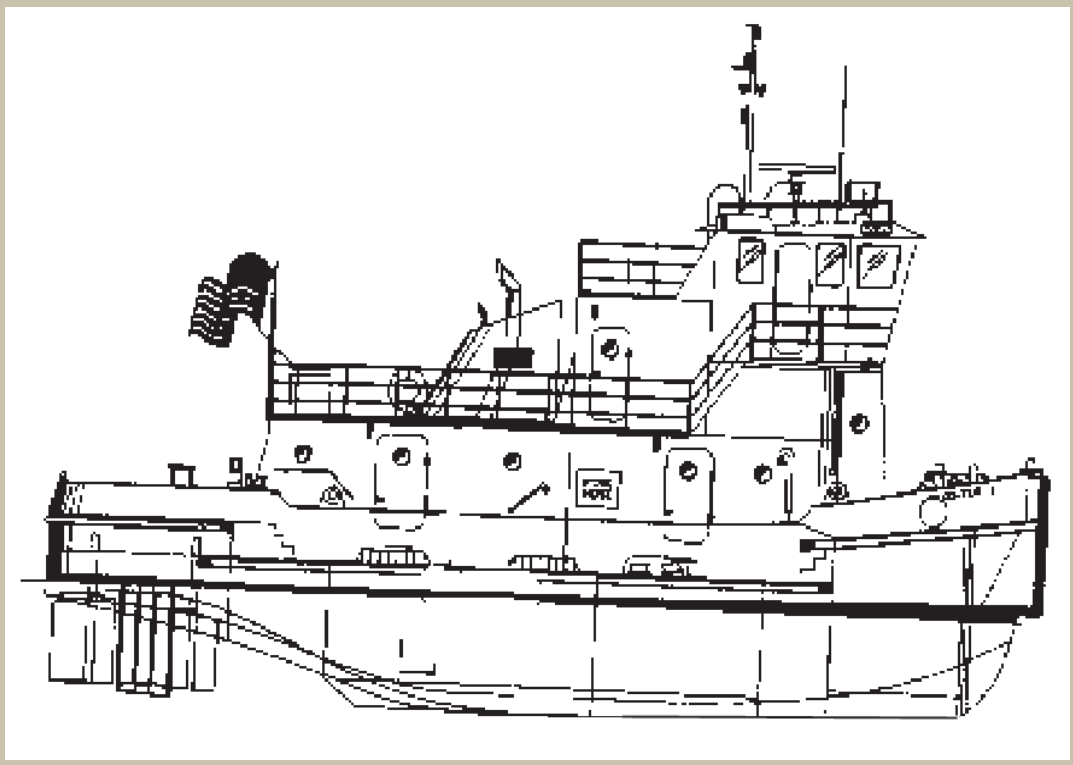


Figure B-7. Army's Small Tug

Note: Craft shown are not to scale.

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APPENDIX C
SHIP CHARACTERISTICS

1. Overview

General characteristics of strategic sealift ships are provided in this appendix.

2. Strategic Sealift Ship Types

a. Characteristics and capacities of some of the more commonly used sealift ships that may be encountered in the JLOTS area are shown in Figure C-1. OPDS tanker configuration is shown in Figure C-2. The information is provided to give JLOTS personnel a general idea of the type and quantity of cargo that may be aboard, any special features, and the pertinent dimensions that will influence the assignment of anchorages. All possible ship types cannot be shown, however, and planners may be required to estimate based on similar types of ships and personal experience. For additional up-to-date information on ship types, characteristics, and capacities go to MSC Homepage at www.msc.navy.mil, and look under ship inventory.

b. These data are current as of August 1988. The capacity figures are additive. For example, the total capacity of the PFC DEWAYNE T. WILLIAMS (TAK) MPS is 150,000 square feet of vehicle space, 346,000 cubic feet of cargo space, and 530 TEU containers. Ships currently in the MARAD RRF are included in Figure C-1. Merchant ship type designators (such as C6-S-lqd) are provided in the first column of the table for some ships.

c. Gross capacity data are given. Actual load capacity is limited by such factors as deck configuration, stow factors, and space required for tie-down. For example, a normal load planning factor is 75 percent of the gross available square footage listed, and 55 to 80 percent of the cubic feet listed, depending on the composition of the cargo loaded.

STRATEGIC SEALIFT SHIP CHARACTERISTICS								
Ship Class	Type	Length Overall	Beam	Draft Full LD	Deadweight Long Ton	Capacity 1/ KSF KCF TEU	Cargo Handling Special Equip	Remarks
CAPE FAREWELL (C9-S-8id)	LASH	893'	100'	38'	40,391	5/		2 in MARAD RRF
MV PAUL BUCK	Common User Tanker	615'	90'	36'	39,624			1 of 13 ships in MSC PM5 program
EMPIRE STATE (T-AP 1001)	Troop Ship	565'	76'	32'	22,629			2 in MARAD RRF
GOLDEN BEAR	Troop Ship	499'	72'	25'	15,000			2 in MARAD RRF
CAPE KENNEDY	RO/RO	696'	106'			148		2 in MARAD RRF
CAPE DECISION	RO/RO	680'	97'	33'	23,800	176	Strn ramp	5 in MARAD RRF
CAPE EDMONT	RO/RO	635'	92'	30'	20,223	150	Strn ramp	1 in MARAD RRF
CAPE HENRY	RO/RO	750'	106'	35'	31,035	205	Strn ramp	3 in MARAD RRF
ALGOL T-AKR (FSS-Fast Sealift Ship)	RO/RO Contr	946'	106'	37'	26,927	217 184	Helo deck; 4 cranes; 1 twin 35 LT midship; 1 twin 50 LT aft; side & stern ramps	Maintained by MSC in reduced operating status
GREEN MT. STATE T-ACS-9 C6-S-MA600	Aux. crane ship; Contr	666'	75'	32'	16,180	307	2 twin boom cranes; 30 LT per boom; 60 LT per pair	

Figure C-1. Strategic Sealift Ship Characteristics

STRATEGIC SEALIFT SHIP CHARACTERISTICS (cont'd)								
Ship Class	Type	Length Overall	Beam	Draft Full LD	Deadweight Long Ton	Capacity 1/ KSF KCF TEU	Cargo Handling Specoal Equip	Remarks
Keystone STATE T-ACS 1-3 C6-S-1qd	Aux. crane ship; Contr	669'	76'	33'	17,502	53 90	3 twin boom cranes; 30 LT per boom; 60 LT per pair	3 ships in MARAD RRF; carry 6 causeways & 4 LCM-8's 2/
GOPHER STATE T-ACS-4-6 C6-S-73c	Aux. crane ship; Contr	610'	78'	32'	16,442	123 711	2 twin boom cranes; 30 LT per boom; 60 LT per pair	Same as KEYSTONE STATE
DIAMOND STATE T-ACS-7-8 C6-S-1xb	Aux. crane ship; Contr	668'	76'	33'	19,867	367	Same as KEYSTONE STATE	2 ships in MARAD RRF; same as KEYSTONE STATE
PVT FRANKLIN PHILLIPS TAK (Maersk Conversn)	MPS RO/RO combo	756'	90'	33'	18,209	156 332	3 twin tandem cargo cranes; helo dck; stbd slewing stern ramp; 3 pt mooring sys	5 ships in class
PFC DWAYNE T WILLIAMS TAK (AMSEA const)	RO/RO	671'	106'	30'	30,000	152 522	5-39 LT pedestal cranes; helo dk; 4pt mooring sys	5 ships in class
PFC EUGENE A OBREGON TAK (Waterman conversn)	BBlk	821'	106'	33'	23,653	186 540	Helo dk; 30T gantry, twin 50T & twin 35T cranes; 4pt mooring sys	3 ships in class
CAPE ORLANDO	RO/RO	635'	92'	30'	20,399	186 252		MSC charter
GREEN WAVE	BBlk	505'	70'	27'	12,923	676		MSC charter

Figure C-1. Strategic Sealift Ship Characteristics (cont'd)

STRATEGIC SEALIFT SHIP CHARACTERISTICS (cont'd)								
Ship Class	Type	Length Overall	Beam	Draft Full LD	Deadweight Long Ton	Capacity 1/ KSF KCF TEU	Cargo Handling Special Equip	Remarks
CAPE TEXAS	RO/RO	634'	89'	28'	14,634	113		2 ships in class (US flag)
CAPE GIRARDEAU (C5-S-75A)	BBlk	605'	82'	35'	22,203	1,108	Self-sustaining	2 in MARAD RRF
CAPE FEAR (T-AK 5061)	LASH	820'	100'	35'	44,605	164		4 in MARAD RRF
AUSTRAL RAINBOW	LASH	820'	100'	35'	29,813	3/ 334	Barge crane	2 in MARAD RRF
CAPE MENDOCINO (C8-S-82a)	SEA-BARGE	876'	106'	39'	38,410	4/		3 in MARAD RRF
ADM. W.M. CALLAGHAN	RO/RO	694'	92'	29'	13,500	148	strn ramp; side ramps; 2-120LT booms	1 in MARAD RRF Carry 2 LCUs
USNS GUAPALUPE	Oiler	678'	98'	35'	40,700			1 of 13 oilers in MSC's Naval Fleet Auxiliary Force
COMET (C3-ST-14a)	RO/RO	499'	78'	27'	9,949	86		1 in MARAD RRF
CAPE JACOB (C4-S-lu)	BBulk Contr	565'	76'	32'	14,349	748		4 in MARAD RRF
CAPE LAMBERT	RO/RO	682'	75'	21'		77		2 in MARAD RRF
CAPE RACE	RO/RO	648'	106'	33'		133		3 in MARAD RRF
CAPE VICTORY	RO/RO	632'	87'	29'		103		2 in MARAD RRF

Figure C-1. Strategic Sealift Ship Characteristics (cont'd)

STRATEGIC SEALIFT SHIP CHARACTERISTICS (cont'd)								
Ship Class	Type	Length Overall	Beam	Draft Full LD	Deadweight Long Ton	Capacity 1/ KSF KCF TEU	Cargo Handling Special Equip	Remarks
CAPE WRATH	RO/RO	648'	106'	38'		213		2 in MARAD RRF
USNS SHUGART	RO/RO	885'	106'	35'		302		2 vessels maintained by MSC
USNS GORDON	RO/RO	956'	106'	37'		321	Stern slewing ramp, port and starboard side ramps, 110T single pedestal twin cranes	2 vessels maintained by MSC
USNS BOB HOPE	RO/RO	950'	106'	35'	36,000	401	Stern slewing ramp, port and starboard side ramps, 110T single pedestal twin cranes	7 vessels by FY01-maintained by MSC
USNS WATSON	RO/RO	950'	106'	34'	36,114	396	Stern slewing ramp, port and starboard side ramps, 110T single pedestal twin cranes	7 vessels by FY01-maintained by MSC
CAPE ALAVA (C4-S-58a)	BBulk	572'	75'	31'	12,728	643		5 in MARAD RRF
CAPE BLANCO (C4-S-66a)	BBulk	540'	76'	33'	14,662	750		5 in MARAD RRF
METEOR (C4-ST-67a)	RO/RO	540'	83'	29'	12,326	117		1 in MARAD RRF

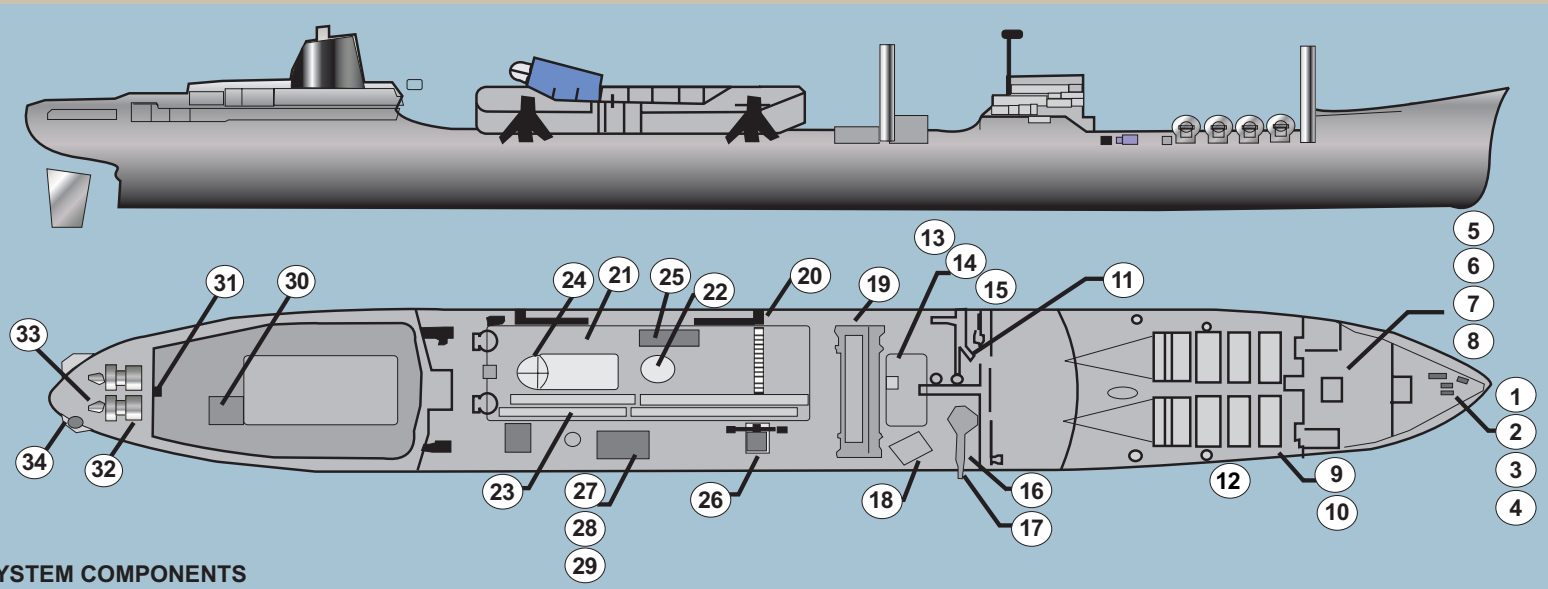
Figure C-1. Strategic Sealift Ship Characteristics (cont'd)

STRATEGIC SEALIFT SHIP CHARACTERISTICS (cont'd)								
Ship Class	Type	Length Overall	Beam	Draft Full LD	Deadweight Long Ton	Capacity 1/ KSF KCF TEU	Cargo Handling Special Equip	Remarks
CAPE INSCRIPTION (C7-S-95a)	RO/RO Contr	685'	102'	32'	18,989	151		4 in MARAD RRF

1/ Capacity data is additive.
2/ LCM-8s must not exceed 60 long tons and they must be lifted with the beams trimmed. It is possible that safe handling of LCM-8s will require tandem lift using 4 booms.
3/ 49 LASH barges (outer dimensions: 61'-6" x 31'-2" x 15') provide about 84.5 sft vehicle space or 875 cft cargo space; latter figures are not additive to total LASH capacity.
4/ 38 SEABEE barges (outer dimensions: 97'-6" x 35' x 17'-3") provide about 103.5 sft vehicle space or 8,487 cft cargo space; latter figures are not additive to total SEABEE capacity.
5/ 74 LASH barges (outer dimensions: 61'-6" x 31'-2" x 15') provide about 132 sft vehicle space or 1,321 cft cargo space; latter figures are not additive to total LASH capacity.
6/ 178,000 bbls.
7/ OPDS vessels come in various hull designs, specifics should be identified through normal MSC or Maritime Administration command channel.

Figure C-1. Strategic Sealift Ship Characteristics (cont'd)

TYPICAL OFFSHORE PETROLEUM DELIVERY SYSTEM LAYOUT



SUBSYSTEM COMPONENTS

1. Single Point Mooring Bracket
2. Mooring Hawser
3. Instrumented Pin
4. Mooring Hawser Tension Readout
5. Offshore Petroleum Discharge System Storage Hold
6. Beach Termination Unit
7. Side Loadable Warping Tug Fittings
8. Conduit Repair Fittings
9. Conduit Reels
10. Conduit
11. Turning Quadrant (P/S)
12. Level Wind (P/S)
13. Offshore Petroleum Discharge System Deck House
14. HPU
15. Product Booster Pump
16. Conduit Clamp (P/S)
17. Overboarding Chute (P/S)
18. Ninth Reel
19. Pig Launcher (P/S)
20. Skid Beam
21. Single Anchor Leg Mooring
22. Dual Product Swivel
23. Submarine Hose
24. Main Mooring Buoy
25. Auxiliary Buoy
26. SLAR Linear Puller
27. Tenth Reel
28. Floating Hose
29. Pigtail
30. Towing Winch Hydraulic Pumps
31. Towing Winch Control Console
32. Towing / Mooring Winch (P/S)
33. Swivelling Fairlead (P/S)
34. Stern Anchor (P/S)

Figure C-2. Typical Offshore Petroleum Delivery System Layout

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APPENDIX D
COMMUNICATIONS PROCEDURES

1. Overview

Communications provide the voice and data connection by which JLOTS commanders make their intent known and conduct operations. Communications systems provide the means for critical orders and directives to flow from commanders to subordinates and status reports to return. Emphasis on good communications practices will be paramount throughout all phases of JLOTS planning and execution. Basic guidelines are found in the JP 6-0 series.

2. Communications Procedures

The following procedures are important for the successful execution of JLOTS operations.

a. JLOTS operations rely on both radio and wire communications for C2. The primary forms of communications for control of lighterage will be the tactical Single Channel Ground and Airborne Radio System, bridge-to-bridge radio (voice) communications using equipment generic to the lighterage, radio telephone using communications satellite (COMSAT) and navigation satellite (NAVSAT), land mobile radios (preferably with three to four frequencies), or cellular telephone. Bridge-to-bridge radio communications can be initially established on channel 16 (emergency net) or channel 13 (156.6 megahertz). A common net will then be established for all lighterage operations in the area. The lighterage control center, lighterage control point, maintenance elements, and Navy and Marine Corps stations will use these nets. Control of the lighterage net would be vested in the harbormaster, beachmaster or JLCC, acting under the direction of the JLOTS staff (operations officer).

b. Control of shoreside facilities will be carried out by both wire and radio. This net will employ wire communications to elements on the beach area and radio to mobile stations. When operating in a fixed facility, established organic communications equipment will be preferred to radio. An operations net will be established by the JLOTS staff operations officer and contain the following stations: harbormaster or beachmaster, discharge points, transfer points, staging and marshalling areas, maintenance elements, administrative areas, Army, Navy, and/or Marine Corps commands, higher headquarters, and the LCC.

c. In a hostile electronic environment or when under command-imposed radio silence, the lighterage control net may use visual signals at the LCC and LCPs to control lighterage. These signals may be lights, flags and pennants, or semaphores. Details of the Army use of these signals may be found in FM-501, *Marine Crewman's Handbook*.

d. If an MIUW unit is assigned for seaward surveillance and interdiction, a separate security network will be required to enable rapid employment of interdiction patrol craft.

3. Unique Communications

a. Strategic sealift communications systems and procedures used for JLOTS are unique because of two factors. The first is the multitude of Service equipment and procedures that will be used in a JLOTS operation. The second is due to the use of commercial maritime communications systems and procedures used on merchant vessels. Therefore, a specific communications plan must be established that will ensure interoperable communications among the participating forces throughout the operation.

b. Plans for JLOTS communications must be based on clear understanding of the capabilities of specific Service units that will participate. Under normal circumstances, naval communications equipment will augment that of commercial shipping. However, in order for commands to communicate effectively with strategic sealift ships, there must be a common understanding of the capabilities of the ships and the delivery procedures of voice and message traffic to them.

c. The communications capabilities in strategic sealift ships range from fleet and commercial satellite communications (i.e., NAVSAT, COMSAT) and on-line cryptographic systems to high frequency, continuous wave (CW) only, off-line, and unclassified communications in contract and charter vessels. Other ships are capable of communicating with commercial coastal radio stations via high frequency voice and CW systems only. These ships may be manned by naval contingents, civil service personnel, crews from the maritime industry, or a combination thereof. Most of these ships have no cryptographic systems and are incapable of handling classified information.

d. A communications exercise similar to a command post exercise (CPX) should be conducted before a JLOTS operation to provide watch station and radio operator training. Actual nets and personnel to be used in the operation should be activated for the CPX.

e. For OPDS operations, the onshore fuels distribution commander is responsible for ensuring communications interoperability with the OPDS tanker. If OPDS communications equipment is not interoperable, the shore-based unit will provide the necessary equipment, including backup. Because of the need for tanker recall until a reserve is established ashore, tanker communications may have to span about 50 miles, which requires at a minimum a very high frequency (VHF) transceiver.

f. Communication and coordination among the JLOTS commander and the MSC representatives are essential for efficient operations. The number of MSC representatives made available to the JLOTS commander must be tailored to the number of ships under MSC control. These representatives are assigned to the JLOTS commander for the operation and it is therefore the JLOTS commander's responsibility to outfit them with adequate communications equipment as identified during mission planning and analysis. Should the MSC representatives require internal communications among themselves, then MSC must provide the equipment and coordinate the frequencies with the JLOTS commander's communications-electronics officer.

4. Communications Plan

A JLOTS communications plan will be based on the OPLAN it supports. It will reflect the communications requirements of the operation and the commanders of the participating forces. These requirements include radio frequencies, call signs, interoperable cryptographic and authentication systems, and special-purpose communications equipment or support. The communications plan details the circuits, channels, and facilities required to support the JLOTS operation, and reflects the JLOTS commander's connectivity with the JFC, Service component commanders, and other elements of the joint force as required. The communications plan should be issued to participating forces well in advance of the operation and should

a. Provide or allocate frequencies to elements of the participating forces.

b. Identify communications security materials and communications security strapping options.

c. Identify dedicated or special purpose nets, circuits, and call signs.

d. Coordinate with supported and supporting combatant commanders for the use of combatant commander- or CJCS-controlled assets, such as RFID interrogators and write stations, which require a Nonsecure Internet Protocol Router Network connection (local area network or satellite).

e. Coordinate the use of host-nation communications facilities with the supported combatant commander.

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APPENDIX E
SUPPORT AND MAINTENANCE OPERATIONS

1. Overview

NBG units are task-organized for JLOTS operations. They come equipped with camp services and maintenance facilities to the intermediate level. Bulk fuel, rations, water, and ammunition are supplied by the commander of the landing force or other troop commander ashore. This arrangement must be clearly spelled out in pre-JLOTS planning. The extent and nature of the support to be provided should be determined and specified in the JLOTS OPORD, letter of instruction, or other implementing directive. The Floating Craft General Support Company provides support and maintenance for Army units.

2. Lighterage

Because of the nature of JLOTS, a Navy amphibious ship might not be available for use in maintenance support. This situation will require planning for maintenance operations to be conducted ashore. The beach support unit's lighterage repair element must carefully and completely plan for the likely maintenance requirements for all lighterage to be employed. Possible alternative plans could include cooperative use of Army facilities, use of a commercial semi-submersible ship, or the rapid repair or buildup of a damaged or underdeveloped port facility. Lighterage maintenance activity would be extremely difficult to conduct from an unprotected beach subject to surf. As a last resort, maintenance can be conducted beyond the surf line from alongside the ELCAS, although this use of the ELCAS will detract from its normal cargo-transfer functions.

3. Camp Support

Army and NBG units are self-sufficient in terms of camp support. The camp area established ashore will house the members of the JLOTS team that install and maintain semipermanent installations such as the OPDS and ELCAS. Camp support must be preplanned for any attachments assigned to the NBG from external organizations. NCHF personnel will be berthed both ashore and temporarily aboard the ships they are unloading. Once ashore, NCHF personnel will integrate into the PHIBCB camp.

4. JLOTS Equipment

a. Maintenance requirements for JLOTS equipment must be carefully analyzed in view of environmental conditions, adversary threat, expected length of operation, and expected availability of higher echelon maintenance support. Maintenance planning for JLOTS operations should be concurrent with other planning and should consider the adequacy of training personnel, pooling of repair resources, amounts of repair or spare parts to stock, and a maintenance float (if required).

b. Planners should remember that equipment subjected to continuous use in less than ideal conditions is subject to breakdown and should include the time required for preventive and corrective maintenance into any timetables developed for JLOTS. Likewise, camp planners must ensure that adequate sheltered maintenance areas are provided early in advanced base construction.

APPENDIX F
SAFE HAVEN REQUIREMENTS

1. Overview

Normally, a safe haven is designated in amphibious assault operations. Safe havens are specific Navy amphibious ships that have well decks and have the capability to provide this service and perform maintenance. Or the safe haven site may be any body of navigable water that remains relatively calm during periods of heavy weather or heavy offshore swells. These naval amphibious ships may not be available to support JLOTS operations that are conducted with strategic sealift ships. Even if the amphibious ships are available, they still would not be able to provide safe havens for all lighterage and floating discharge facilities and equipment that are employed in support of discharge operations. Since most discharge equipment is weather-sensitive, safe havens must be designated and a workable plan must be promulgated for safe haven use to ensure safe and effective JLOTS operations.

2. Site Selection

Selection of a boat safe haven site must be accomplished before the arrival of JLOTS facilities and lighterage. The safe haven site can include breakwaters, bays, protected river mouths, and land masses leeward of dominating weather and swell conditions. For some lighterage, beaching on a protected beach can suffice. Safe havens should be close to the JLOTS area.

3. Safe Haven Operations

a. Safe haven requirements will be provided for special equipment and material, RRDF, and all types of lighterage. Towing and towing backup requirements must be stated in a safe haven evacuation plan.

b. Calm water operations, such as those using the RRDF, should be conducted in an appropriate anchorage nearest the designated safe haven. Further, appropriate tug or tow boats must be dedicated to the task of moving such facilities on short notice.

c. In the event of heavy weather forecasts, tug boats, salvage craft, and any other craft that can assist in the towing of lighterage and other floating equipment to the safe haven should be placed in a weather alert status and should be prepared to execute an evacuation plan accordingly. The NBG commander will formulate the safe haven evacuation plan before arrival in the JLOTS area, and the JLOTS commander will review such procedures with Service counterparts in the event of a joint operation. Amphibians usually do not require safe havens, as they seek refuge on land from impending high surf or storm.

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APPENDIX G
SEA STATE, WEATHER, AND SURF

1. Overview

In selecting a landing site for JLOTS operations, the weather and effects of the sea play a key role. Prior to selecting a site, planners should research historical weather conditions for that particular location or region. During LOTS and/or JLOTS, continued cognizance of existing weather and surf conditions is imperative to the successful execution of a JLOTS operation.

2. Wind and Sea States

a. As shown in Figure G-1, the Pierson-Moskowitz sea state scale provides a concise and sequential listing of wind speed, wave characteristics, and sea states. It should be used as the reference guide in correlating the effect of wind speed and significant wave heights on sea states.

b. The modified surf index is a single dimensionless number which provides a relative measure of the conditions likely to be encountered in the surf zone. For the reported or forecast conditions, the modified surf index provides a guide for judging the feasibility of landing operations for each type of landing craft. When applied to a known or forecast surf condition, the modified surf index calculation provides the commander with an objective method of arriving at a safe and reasonable decision with respect to committing landing craft. Modified surf limits for landing craft should be used in conjunction with the Pierson-Moskowitz sea state scale when conducting JLOTS operations.

3. Weather Information

Weather information concerning the offshore discharge area must be analyzed carefully to determine the probable effect of weather on lighterage operations and working conditions. Cargo operations in such adverse weather are negatively affected by sea, swell, and surf conditions. Local winds, thunderstorms, and reduced visibility are other environmental conditions that affect JLOTS operations. Frequent and accurate weather and surf forecasts are essential to the expeditious, efficient, and safe offload of strategic sealift ships.

4. Weather Forecasting

a. A METOC team must be assigned throughout the duration of a JLOTS operation. It should be collocated with the JLOTS commander. This METOC team, comprised of a combination of designated AFW and Navy MET members, will provide effective and timely on-scene 24-hour weather forecasts to the JLOTS commander. The arrival of the METOC team should be coordinated through the METOC staff of the Air Force or Navy component.

PIERSON-MOSKOWITZ SEA SPECTRUM							
Sea State	Significant Wave (Ft)	Significant Range of Periods (Sec)	Period of Maximum Energy (Sec)	Frequency Maximum Energy (Sec)	Average Period (Sec)	Average Wave Length (Ft)	Wind Speed (Kts)
0	0.10	0.34 - 1.09	0.87	7.22	0.62	1.31	2.51
0	0.15	0.42 - 1.33	1.07	5.87	0.76	1.97	2.83
1	0.50	0.77 - 2.43	1.95	3.22	1.39	0.57	5.17
1	1.00	1.09 - 3.43	2.75	2.28	1.96	13.14	7.31
1	1.20	1.19 - 3.76	3.02	2.08	2.15	15.76	8.01
2	1.50	1.34 - 4.21	3.38	1.86	2.40	19.70	5.05
2	2.00	1.54 - 4.86	3.90	1.61	2.77	26.27	10.34
2	2.50	1.72 - 5.43	4.36	1.44	3.10	32.84	11.36
2	3.00	1.89 - 5.95	4.78	1.31	3.40	39.41	12.66
3	3.50	2.04 - 6.43	5.16	1.22	3.67	45.98	13.68
3	4.00	2.18 - 6.87	5.52	1.14	3.92	52.54	14.62
3	4.50	2.31 - 7.29	5.86	1.07	4.16	59.11	15.51
3	5.00	2.44 - 7.68	6.17	1.02	4.38	65.68	16.35
4	6.00	2.67 - 8.41	6.76	0.93	4.80	78.82	17.91
4	7.00	2.89 - 9.09	7.30	0.86	5.19	91.95	19.34
4	7.50	2.99 - 9.41	7.56	0.83	5.37	98.52	20.02
5	8.00	3.08 - 9.71	7.81	0.80	5.55	105.09	20.68
5	9.00	3.27 - 10.30	8.28	0.76	5.88	118.22	21.93
5	10.00	3.45 - 10.86	8.73	0.72	6.20	131.36	23.12
5	12.00	3.78 - 11.90	9.56	0.66	6.79	157.63	25.33
6	14.00	4.08 - 12.85	10.33	0.61	7.34	183.90	27.36
6	16.00	4.36 - 13.74	11.04	0.57	7.84	210.17	29.24
6	18.00	4.63 - 14.57	11.71	0.54	8.32	236.45	31.02
6	20.00	4.88 - 15.36	12.34	0.51	8.77	262.72	32.70

Figure G-1. Pierson-Moskowitz Sea Spectrum

PIERSON-MOSKOWITZ SEA SPECTRUM (cont'd)							
Sea State	Significant Wave (Ft)	Significant Range of Periods (Sec)	Period of Maximum Energy (Sec)	Frequency Maximum Energy (Sec)	Average Period (Sec)	Average Wave Length (Ft)	Wind Speed (Kts)
7	25.00	4.45 - 17.17	13.80	0.46	9.80	328.40	36.56
7	30.00	5.97 - 18.81	15.12	0.42	10.74	394.08	40.04
7	35.00	5.45 - 20.32	16.33	0.38	11.60	459.76	43.25
7	40.00	6.90 - 21.72	17.46	0.36	12.40	525.43	46.24
8	45.00	7.32 - 23.04	18.52	0.34	13.15	591.11	49.04
8	50.00	7.71 - 24.28	19.52	0.32	13.87	656.79	51.70
8	55.00	8.09 - 25.47	20.47	0.31	14.54	722.47	54.22
8	60.00	8.45 - 26.60	21.38	0.29	15.19	788.15	56.63
9	70.00	9.12 - 28.73	23.09	0.27	16.41	919.91	61.17
9	80.00	9.75 - 30.72	24.69	0.25	17.54	1098.87	65.39
9	90.00	10.35 - 32.68	26.19	0.24	18.60	1182.23	69.36
9	100.00	10.91 - 34.34	27.60	0.23	19.61	1313.59	73.11

Figure G-1. Pierson-Moskowitz Sea Spectrum (cont'd)

b. Conditions beyond the range of short-term forecasts are estimated by using available climatological data. Current climatological-based forecasts provide such information as the average weather and oceanographic conditions, to include temperature data, visibility, strength, and direction of prevailing winds, sea and surf data, and astronomical data. The assigned METOC team is the primary source for METOC data for units operating on the beach.

5. Surf

Surf can be predicted by using meteorological data to forecast weather and by examining meteorological data in conjunction with hydrographic conditions. The surf zone will seriously affect the progress of an operation in the following areas.

a. **Breaker Period.** The period of the breaker is the time lapse between successive wave crests and is a significant factor in determining the type of breaker, its height, refraction, and velocity. In addition, the direct effect of breaker period on lighterage is simply a matter of the frequency at which the breakers impact on the craft. Short period storm waves from local sources may arrive every 6 to 12 seconds. Under these conditions, navigational difficulties will occur because the craft will not have cleared or recovered from the impact of one breaker before the next one arrives. This difficulty is not encountered with breakers generated from long period swells. These breakers have a period of between 10 to 20 seconds. On steep beaches, long period breakers also provide an opportunity for landing craft to pass through the surf zones between breakers.

b. **Type of Breaker.** The type of breaker that lighterage is navigating will have a significant impact on its ease of operation. Plunging and surging breakers have a steep angle from trough to crest. Thus, when these breakers hit the lighterage, the effect is that of hitting a wall of water that is to be broken through rather than ridden over. If plunging or surging breakers are high enough, their pounding effect on lighterage can pose serious problems to navigation. Conversely, spilling breakers have a shallower angle from trough to crest. Lighterage tends to ride over them. Even at greater heights, if the period of the waves is long enough, lighterage can navigate without difficulty.

c. **Breaker Angle.** Under certain conditions waves will break at an angle to the shore, causing a littoral current. Short period waves, wind waves, and chop do not undergo any appreciable refraction when approaching a beach. Thus, if their deep water angle of approach is not parallel to the beach, these waves will break at an angle. The degree of refraction undergone by a long sea swell tends to be dependent on the beach gradient. On beaches with mild gradients, waves will refract enough to break almost parallel to shore. Little or no refraction occurs on steep beaches. This results in plunging breakers and a strong shore current traveling in the same direction as the waves. If wave height and angle of breaking are sufficient, this littoral current can have a speed of up to 3 or 4 knots. The speed of the current will also vary in different parts of the surf zone. Both the angle of breaking and the littoral current will cause problems for lighterage operations.

d. **Surf Damage.** Breakers that hit lighterage broadside or at an angle can cause them to broach or swamp. In order to remain perpendicular to the breakers, lighterage must approach the beach at an angle. When traversing the littoral currents, which are parallel to the beach and of varying speeds, the coxswain must constantly adjust the rudder angle and propeller revolutions per minute to prevent broaching. Once the craft has beached, the breakers will hit the lighterage at an angle. This also causes difficulty in preventing broaching or swamping long enough for the craft to be discharged.

e. **Underwater Topography.** Underwater topography affects an operation by influencing the character of the surf zone and navigation of lighterage. Other aspects of topography that influence lighterage operations include beach gradient, reefs, sandbars, and underwater obstacles.

f. **Beach Gradient.** In addition to influencing the type, speed, and depth at which waves break; beach gradient will affect how close to the shore lighterage can beach. Beaches with mild or flat gradients cause landing craft to run aground too far from the beach. Discharge equipment must move into the water to discharge cargo, which makes the operation more hazardous and increases discharge time. Steep gradients make it difficult for landing craft operators to keep the craft at right angles to the beach. Currents or mild or angling surf can readily broach or swamp the vessel. Generally, gradients from 1:20 to 1:30 are best for LCUs and gradients from 1:10 to 1:20 are best for LCMs. Listed below are categories of beaches by steepness of the gradient.

(1) Steep — more than 1:15.

(2) Moderate — 1:15 to 1:30.

(3) Gentle — 1:30 to 1:60.

(4) Mild — 1:60 to 1:120.

(5) Flat — less than 1:120.

6. Surf Forecasting

a. JLOTS operations require surf forecasting in addition to surf observations. The surf height can be a critical factor in these operations. Although hazards to lighterage and discharge facilities increase with increasing breaker height, difficulties encountered also depend on the width of the surf zone, the time between breakers, and the type of breaker.

b. The OCO will monitor surf observations received at least every 2 hours from the beach party element ashore. Although the OCO may request a surf observation (SUROBS) report at any time during operations, the assigned beach party team will conduct SUROBS every 2 hours and will pass the new and evaluated information to the OCO. Such evaluation will contain a forecast of future surf conditions based on weather forecasts obtained from the assigned METOC team. With sufficient manpower, the assigned METOC team will also be capable of recording and reporting SUROBS, as required. The surf forecast format is contained in Commander,

Naval Surface Force, Pacific Commander, Naval Surface Force, Atlantic NWP 3-59.3, *Surf Zone Operations*. The elements of the surf forecast or surf observation report are as follows.

(1) ALPHA — Significant Breaker Height. The mean value of 1/3 of the highest breakers on the beach measured to the nearest half foot.

(2) BRAVO — Maximum Breaker Height. The highest breaker observed or forecast during the period measured to the nearest half foot.

(3) CHARLIE — Period. The time interval between breakers measured to the nearest half second.

(4) DELTA — Breaker Types. Plunging, spilling, or surging preceded by the numerical percentage of each as applicable.

(5) ECHO — Angle of Breaker with the Beach. The acute angle, in degrees, a breaker makes with the beach. Also indicates the direction toward which the breaker is moving, RIGHT flank or LEFT flank.

(6) FOXTROT — Lateral Current. The alongshore current, measured to the nearest tenth knot. Also given is the direction toward which a floating object is carried, RIGHT flank or LEFT flank.

(7) HOTEL — Additional Remarks. Other information important to landing operations, i.e., wind direction and velocity, visibility, debris in the surf zone, secondary wave system if present, and dangerous conditions.

c. **Modified Surf Index (MSI)** is a single dimensionless number which provides a relative measure of the conditions likely to be encountered in the surf zone. For the reported or forecast conditions, the MSI provides a guide for judging the feasibility of conducting landing operations for each type of landing craft.

(1) **MSI calculation.** When applied to a known or forecast surf condition, the MSI provides the commander with an objective method of arriving at a safe and reasonable decision with respect to committing landing craft and amphibious vehicles. Limiting surf conditions for training operations are set by the commander concerned. These limits shall not exceed condition acceptable for routine operations as calculated by the method described below in Figure G-2. CAUTION: Surf capability of landing craft and amphibious vehicles computed by this method assume such craft are in good condition. It does not take into consideration the state of personnel training or of equipment maintenance.

(2) The Modified Surf Limit is the maximum that should be attempted for routine operations. If the MSI exceeds the Modified Surf Limit of the craft or vehicle, the landing is not feasible without increasing the casualty rate. If the MSI is less than the Modified Surf Limit of the craft, the landing is feasible.

MODIFIED SURF INDEX CALCULATION SHEET	
Surf Observation/Surf Forecast: **Beach:**	Date-Time
Significant Breaker Height (ALFA): (Significant breaker height in feet)	_____ Feet
Breaker Period (Charlie): (Enter value from Breaker Period Modification Table)	_____ Seconds
Breaker Type (DELTA): % Spilling _____ %Plunging _____ %Surging (Enter value from Spilling Breaker or Surging Breaker Table)	
Breaker Angle (ECHO): (Enter value from Wave Angle Modification Table)	_____ Degrees _____ (a)
Lateral Current (FOXTROT): (Enter value from Lateral Current Modification Table)	_____ Knots _____ (b)
Enter the larger of (a) and (b) from above	_____
Relative Wind (HOTEL): (Degree Onshore/Offshore, enter value from Wind Modification Table)	_____ Knots
Secondary Wave Height (HOTEL): (Enter Secondary Wave Height in feet, if applicable)	_____ Feet
Modified Surf Index: (Sum of all entries in the right hand column to obtain MSI)	_____

Figure G-2. Modified Surf Index Calculation Sheet

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APPENDIX H
PERSONNEL MOVEMENT IN THE LOGISTICS OVER-THE-SHORE/ JOINT LOGISTICS OVER-THE-SHORE OPERATION AREA

1. Overview

a. The movement of personnel must be controlled within the beach area to ensure noninterference with offload discharge operations, the safety of transients, and security considerations. The offload coordinator or terminal commander will establish a plan addressing the movement of personnel within the immediate offload area and between the beach and offshore discharge sites. The transporting of hatch crews, shipboard personnel, military authorities, reliefs, and working parties should be included in such a plan.

b. Two types of personnel movement will be addressed in this appendix: the movement of transient troop units in and through the LOTS and/or JLOTS area, and the movement of personnel involved in the LOTS operation.

2. Transient Troop Movement

Because of the large concentration of equipment in the offload area, the movement of transient personnel into and through the area must be minimized and closely controlled. The planning for and organization of the offload area should include a separate area, as feasible, within the offload area for the debarkation of personnel and units. The movement of personnel through the offload area will be under the control and coordination of the offload coordinator or terminal commander. Ultimately, the determining factors in planning for troop movement into and through the area are the nature and size of the unit, its parent command, its mission ashore, and the type of shipping on which it arrives.

3. Movement of LOTS Personnel

In planning for personnel movement, the JLOTS commander will allocate to the OCO or JLCC dedicated lighterage and crews. Lighterage designated for personnel movement will be assigned by the OCO to the control of one designated lighterage control officer (LCO) or ship lighterage control point. The LCO in charge of personnel movement between ships and between ship and shore will be stationed where he or she can best control the lighterage assigned. Requests for movement of personnel (e.g., a hatch team from ship A to ship B) will be directed to this LCO. The LCO will then assign appropriate lighterage, based on size of the group to be moved, equipment moving with the group (if any), and priority of the group's mission relative to that of other groups requesting movement. Lighterage assigned personnel movement functions will keep in contact with the LCO and receive movement orders from that LCO only. The LCO tasked with personnel movement must be clearly designated in the communications plan; be given radios, communications, and call signs; and be provided with locations adequate for the observation of lighterage under the LCO's control. In the event that general cargo movement lighterage is temporarily tasked to move personnel, it will fall under the tactical control of the LCO until such personnel transfer is completed. It will then go back to the control of the

appropriate LCO for cargo movement. Once ashore, personnel movement procedures will be controlled by the parent organization.

4. Movement of Personnel to Vessel Decks

Lighter crews must be proficient in coming alongside a vessel and they must ensure they have appropriate fenders. If at all possible, crews should learn to come alongside a vessel and become proficient at holding a station at the companion way. If this is not possible, personnel may have to use the Jacob's ladder or be lifted by crane to the deck. If lifting personnel via crane is the only way to place personnel on deck, rope safety nets specifically designed for this purpose may need to be procured.

APPENDIX J
SECURITY OF OFFLOAD ANCHORAGE OR BEACH AREAS

1. Overview

a. The JFC is responsible for overall security in the JLOTS area. The JFC will, in accordance with applicable status-of-forces agreements, determine host-nation security support availability and adequacy, if applicable, and, if necessary, will establish clear rules of engagement and additional measures to provide security as required. This responsibility may be delegated to a subordinate commander capable of providing adequate security. Appropriate forces for security must be provided, depending on the threat and tactical situation, to protect the offshore area as well as the beach reception area.

b. JLOTS operations are normally conducted in a low threat environment; i.e., the operation is out of range of adversary artillery fire. Primary threats to consider are air and rocket attacks, ground attack by adversary forces, guerrillas, or insurgents, and sabotage. CBRNE warfare is considered possible. JLOTS operations are a critical link in the resupply system; therefore, an attack in one form or another is possible. The defensive posture of the terminal battalion varies depending on the type of threats considered likely.

2. Offshore Security

a. Offshore security in the anchorage area is particularly important because of the vulnerability of strategic sealift ships. Unlike naval ships, merchant type ships are relatively thin-skinned and sparsely compartmented, rendering them vulnerable to catastrophic loss. Following the successful execution of operation GUARDIAN MARINER during the initial rotation of Operation IRAQI FREEDOM, the MSC stood up a force protection (FP) capability consisting of 12-person embarked security teams (ESTs), armed with crew-served weapons. The ESTs sail aboard the MSC vessels, providing FP enroute to the offload location, including time at the anchorage area.

b. Security measures may be both active and passive. Active security involves seeking out and neutralizing any adversary threat. Passive security focuses on timely detection of threats. Local security in the anchorage area may include the following efforts.

(1) Active and passive surface patrol and interdiction operations.

(2) Active and passive anti-swimmer operations that could include the use of combat swimmers, concussion grenades, charged firehoses, various detection systems or sensors, and roving patrols.

c. Offshore security is provided by surveillance and interdiction elements attached to the Navy component commander. Mobile ashore support terminal (MAST) detachments attached to either naval coastal warfare group or harbor defense command units (HDCUs) provide communications systems and intelligence for mobile inshore undersea warfare units (MIUWUs) and inshore boat units (IBUs). MIUWUs provide surveillance utilizing surface search radar, subsurface acoustic monitoring,

thermal and enhanced imagers, and control IBU and/or PSU patrol craft, vectoring them to interdict surface and subsurface contacts. IBUs provide point defense out to ten miles. PSUs provide point defense in an inner harbor environment. For JLOTS security tasks, the communications systems and intelligence functions of the HDCU are analogous to an Army tactical operations center or rear area operations center having ultra high frequency-VHF and high frequency-covered and clear communications.

(1) Each fully equipped MIUWU has 12 officers and 90 enlisted personnel, and a rapidly deployable detachment (air detachment) complement has 2 officers and 10 enlisted personnel. Approximately two MIUWUs with reduced tables of allowance (TOAs) can be constituted from organic Navy support personnel and mounted-out for transit within 48-hours an air detachment. An air detachment can sustain operations for 14 days before being evacuated or reinforced by the residual or the unit.

(2) In general, entry and egress into the LOTS anchorages and exclusion areas are controlled by the MIUWU. This exclusion area is designated the inner defense zone (IDZ) and its radius is determined by the effective range of the small arms and light caliber weapons of a ship's defense forces-about 2,000 yards. Any craft entering the IDZ via an unauthorized lane or channel is presumed hostile and may be engaged if authorized by current rules of engagement. The radius of the IDZ is also determined by the displacement of the anchorages and ship-to-ship traffic between them by lighterage and other small craft. An outer defense zone (ODZ) is established for the benign passage of commercial vessels and private craft, but is patrolled by armed craft to ensure against unauthorized entry into the IDZ. The radius of the ODZ is about 30,000 yards, the effective radar line of sight of an MIUWU. Any craft having a projected radar track into the IDZ will be intercepted by the patrol craft and warned to stay clear. For the submarine and swimmer delivery vehicle threat, sonobouy barriers are established at 15,000 yards in the most probable threat axis or avenue of approach. Swimmer defense is the responsibility of each ship and can be affected by active sonar; topside sentries; shaft rotation to create a wash; floodlights; or random percussion grenades. If combat swimmers are a high threat, sea-air-land team support may be required.

(3) An MIUWU TOA includes the AN/TSO-108A(V)3 radar-sonar-surveillance center van that is towed by a 5-ton truck, a portable sensor platform (PSP) that is towed by an high mobility multipurpose wheeled vehicle (HMMWV) equipped with a mobile sensor platform (MSP), and a variety of smaller support vehicles and equipment. Some MIUWUs are equipped with a drash tent and HMMWV version of their sensor package, which reduced weight, providing more airlift options, and configuration flexibility. Both the PSP and MSP utilize a Furuno radar and a sonar suite consisting of a SOR 17 sonobouy processor that has target recognition capabilities and directional capabilities from information provided by either moored or free-floating sonobouys. MIUWUs can be equipped with the light array subsystem that provides improved subsurface acoustic monitoring, target recognition and directional capabilities. The installed communications equipment is interoperable with fleet, US Coast Guard vessels and Marine Corps-Army communications.

(4) A fully equipped MAST detachment has personnel, with a complete communications systems and intelligence suite able to communicate with most units via voice or data.

(5) A fully equipped IBU has 34 personnel, 2 officers, and 12 enlisted. An IBU TOA includes two twenty-seven foot boats capable of 45 knots. Each boat is equipped with a surface search radar, night vision devices, .50 caliber and M-60 machine guns. An IBU sustainment package is 30 days.

d. The US Coast Guard PSU will provide the JLOTS commander with teams capable of evaluating and overseeing physical security measures on waterfront facilities, performing surveillance duties, and establishing and enforcing restricted access areas, security zones, and safety zones in order to control personnel or vessel access to sensitive portions of a port area or complex. The PSU will also provide teams to oversee and supervise the transfers of military and/or commercial explosives, hazardous materials in bulk or packages, and petroleum, oils, and lubricants cargoes.

(1) A PSU will be assigned in accordance with the OPLAN, includes 14 officers and 103 enlisted personnel, and is composed of the following: C2 team, liaison officer, and port safety detail, as well as engineering (deployed boat and light vehicle maintenance), weapons, electronics, communications, subsistence, medical, and administrative support teams.

(2) The PSU's major equipment consists of six trailerable patrol boats and parts. The commander receiving the PSUs will be responsible for providing strategic lift support forces, and will also be responsible for providing vehicles, medical and subsistence support, and a location to make boat repairs. PSUs are deployed with provisions to sustain members of a unit for 30 days.

3. Beach Security

The provision and execution of beach area security is completely scenario-dependent. In the early post-assault phase of an amphibious operation, security of the beach reception area may be carried out by air, ground, and naval combat forces. At the other end of the spectrum, as would normally be expected in a JLOTS operation, security in a nonhostile overseas environment may be provided largely by the host nation.

4. Responsibilities

Responsibilities for security planning and execution are shown below. These responsibilities are not all-inclusive and are only representative of the many security considerations attendant to various operational JLOTS scenarios. See notional geographic organization for joint rear area, Figure J-1.

See JP 3-10, Doctrine for Joint Rear Area Operations*, JP 3-10.1,* Joint Tactics, Techniques, and Procedures for Base Defense*, and JP 3-11,* Joint Doctrine for Operations in a Nuclear, Biological, and Chemical (NBC) Environments*, for additional information on base defense and security.*

a. **Supported Combatant Commander.** Responsibilities include the following:

(1) Security of strategic sealift forces during operations conducted in the AOR.

(2) Requests for additional security support from other unified commands and national or international agencies through the CJCS.

b. **Officer in Tactical Command (if assigned).** Responsibilities include the following

(1) Security of the objective area to the high water line.

(2) Coordination of security operations with supporting and adjacent commands and country.

(3) Requests for additional security support or forces from higher authority.

c. **Commander of the Supported Forces Ashore.** Responsibilities include the following

(1) Conducting active and passive security measures throughout all phases of operations ashore beyond the high water line, as directed by higher authority.

(2) Requests for additional security support or forces from higher authority as required.

(3) Coordination of security in the JLOTS objective area with the OTC (if assigned).

5. General Principles for Defense

The following are defensive principles to be considered for JLOTS operations.

a. **Warning Systems.** A warning system is established to alert personnel in the event of an attack. Examples of such systems are clanking of metal to indicate a CBRNE attack; a series of short blasts of a vehicle's horn for an air attack; and a continuous blast of a horn for a group attack. All personnel are taught how to initiate the warning system when necessary and to recognize the signals when heard. All personnel are thoroughly briefed on how to react to each type of alarm.

b. **Cover, Concealment, and Dispersion.** A JLOTS operation is so large that it is impossible to cover or conceal it. However, the proper use of smoke cover, concealment, and dispersion can minimize the effect of adversary observation and attack. Cover and concealment are used to frustrate adversary observation and fire. Vehicles are dispersed in the motor pool as passive defense against air attack. When amphibians are used, these craft are dispersed over the entire operational area to deny adversary aircraft a concentrated target.

c. **Defensive Plans.** The four main areas for which defensive plans are developed are attacks from naval warships, air strikes, ground attack, and CBRNE attack.

(1) **Naval Attack.** Defense against naval forces is primarily a Navy responsibility. Coordination with both the Navy and the Air Force is conducted. Internally, the possibility of such an attack requires personnel in the operation to know how to react against incoming adversary fires. Personnel aboard ships and lighterage also must know procedures for shipboard firefighting and abandoning ship.

(2) **Air Attack.** The possibility of air attack necessitates the digging of foxholes or bunkers in all areas of the operation where personnel are located. Both passive and active air defense plans are developed. If the threat is serious enough, coordination for weapons heavier than small arms and STINGERS is made. Army FM 44-8, *Combined Arms for Air Defense*, provides Army units guidance on defense against air attack.

(3) **Ground Attack.** The perimeter defense is the primary means of defense against group forces. The outer edge of this defense consists of intrusion detection systems, observation posts, and patrols. These systems are followed by a series of defensive lines. Fire plans are carefully developed so that all possible areas are covered. Automatic weapons and mines cover primary avenues of approach. Concertina wire is used to restrict and funnel adversary movements. Mortar, artillery, or naval bombardment is coordinated to cover those areas that cannot be covered by direct fire. Army FM 3-0, *Operations*, contains guidance on coordination of defensive fire.

(4) **CBRNE Attack.** CBRNE weapons can be launched from sea, air, or ground. The primary focus of defense against these weapons is the survival of the individual soldier and minimizing the weapons impact on the operation. Use of individual protection gear is required and washdown facilities must be provided.

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APPENDIX K
COMMAND, ORGANIZATION, AND WORKING RELATIONSHIPS WITH CIVILIAN MERCHANT MARINERS

1. Overview

Strategic sealift ships participating in JLOTS operations are usually crewed by civilian mariners of the US Merchant Marine. Sometimes referred to as "the fourth arm of defense," the US Merchant Marine played critical roles in both World Wars I and II, the Korean War, the Vietnam War, and the first Gulf War. To conduct JLOTS operations with civilian-manned ships effectively, safely, and expeditiously, it is important to understand the organization, authority, and responsibilities of the merchant mariners who operate the ships.

2. Merchant Mariners

a. **MSC Mariners.** MSC strategic sealift ships are manned, in part, by US Government civil service mariners. They may or may not be members of maritime labor unions. The COMSC administers the civil service mariners program in accordance with Navy standards of personnel performance and disciplinary tradition. MSC policy also conforms as closely as possible with current conditions and practices of employment in the private commercial maritime industry. The majority of strategic sealift ships, however, are manned by private sector merchant mariners.

b. **Private Sector Merchant Mariners.** Most ships involved in JLOTS are manned by this category of civilian mariners. Conditions of employment in the Merchant Marine are contained in US Coast Guard regulations and commercial shipping company rules and working agreements, which are negotiated by maritime unions and the companies.

c. **Licensed and Unlicensed Mariners.** The master, mates, engineers, and radio officer are considered licensed personnel and must qualify and keep current through US Coast Guard examinations. All other merchant mariners are considered unlicensed personnel.

d. All personnel in a theater where CBRNE weapons are a high threat must be equipped and trained with individual protective equipment. While contracts should be written beforehand that require these individuals to be equipped and trained, plans should include verification, and, when required, remedial actions.

3. Strategic Sealift Shipboard Organization

Under the master, commercial merchant ships are organized in three basic departments: deck, under the chief mate; engine, under the chief engineer; and steward, under the chief steward. Additionally, one or more military organizations (a merchant ship squadron commander and staff, an offload preparation party, and other military organizations) may be aboard.

a. **The Master.** The master's inherent authority stems from a responsibility for the safety of all embarked personnel in carrying out the assigned tasks. This authority is defined by

maritime law, applicable federal statutes, and US Navy regulations. In addition, the master's authority stems from a responsibility for complying with the administrative directives of COMSC or MSC subordinate commanders and the operational orders of the task force, task group, or task unit commander when attached to the latter for OPCON. The master is responsible for enforcing all applicable US laws and all applicable orders and regulations of the US Navy, US Coast Guard, and the task force commander. This responsibility includes the following

(1) Safety of the ship, all persons on board, and the cargo.

(2) Navigation and operation of the ship.

(3) Maintenance of discipline among the civilian mariner crew.

(4) Providing the commanding officer or OIC of any embarked military unit with:

(a) Every reasonable facility and assistance required for the safety, well-being, and efficiency of the embarked military detachment; and

(b) Copies of all messages and directives pertaining to schedules, port regulations, and movements of the ship.

b. **The Chief Mate.** The chief mate (sometimes referred to as the "first officer") is the second-in-command on a merchant ship. The chief mate is in charge of the deck department and is responsible for the ship's cargo and cargo loading or unloading operations. The chief mate is usually a nonwatchstander and, in most cargo discharge operations, will be the principal interface point between the military offload control organization and the ship.

4. On-Scene MSC Representative

During the course of JLOTS operations, it may become necessary for the JLOTS commander to require that the MSC ships take specific actions, such as shifting to a different anchorage or operations. Only an MSC representative has the contractual authority to provide legally binding direction to the ship's master. Therefore, because of the close working relationship that must exist between military and civilian mariners during JLOTS operations, it is important that an on-scene MSC representative be present. During OPDS operations, when performance of the civilian tanker crew is particularly critical to the installation and retrieval of OPDS components, the on-scene MSC representative should remain readily available to immediately resolve differences between the military OPDS personnel and the ship's crew.

5. Embarked Military Offload Units

The most common type of military offload unit is the offload preparation element. This unit will conduct the offload of strategic sealift ships, subject always to the inherent authority of the master when the safety of the ship, embarked personnel, or crew is concerned. Any differences of opinion between or among the master and commanding officers or OICs of units will be

referred to the on-scene MSC representative or, in his or her absence, the JLOTS commander for resolution. The ship's master, however, is ultimately responsible for the overall safety of the ship.

6. Cooperation

Civilian crew members and military personnel are complementary and are part of a team designed to accomplish important military objectives with available sealift forces. The necessity for coordination and cooperation between civilian mariner personnel and the military cannot be too strongly emphasized. The civilian mariner personnel must realize that the Army and Navy Department have placed the military on board in order to perform an important military operation. Civilian crew personnel must also realize that the military is a distinct entity, separate from the ordinary complement of the ship and under the direction of a military officer. The ship's master and chief mate have distinct legal responsibilities for the ship's cargo handling equipment and various aspects of certain cargo discharge operations. They have the authority to stop operations if the safety of the ship or crew is endangered. Such cases should be referred to the on-scene MSC representative or, in his or her absence, the JLOTS commander for resolution, if necessary.

7. Working Relationships

Specific working relationships must be fixed before the start of a JLOTS operation as to who is responsible for the various routine matters that will normally occur during the operation. In the case of merchant vessels, these responsibilities may have to be delineated in the contract under which the merchant vessel is providing services for the operation. These matters include the following.

a. Normal working hours and conditions necessitating overtime pay for the civilian crew, including breaks for meals.

b. Who will

(1) Operate what equipment, such as ship hatches and cranes.

(2) Provide drivers for vehicles.

(3) Prepare vehicles for startup.

(4) Provide safety observers.

(5) Conduct maintenance.

(6) Provide cargo handling gear, such as cargo nets.

c. Functions that military personnel have to perform on the merchant vessel.

d. Personnel support to be provided for military personnel by merchant ships (e.g., messing, berthing, habitability, working facilities, and head facilities).

e. Mooring and fendering systems.

APPENDIX L
SAFETY CONSIDERATIONS IN JOINT LOGISTICS OVER-THE-SHORE OPERATIONS

1. Overview

Most JLOTS operations are inherently hazardous because of the unprotected or semiprotected maritime environment, large volumes of bulk, oversized, and outsized cargo throughout, high tempo of operations, and large numbers of complex and specialized lighterage and cargo handling equipment. This appendix is not intended to be a comprehensive listing of safety warnings and cautions associated with all the systems and subsystems and evolutions associated with JLOTS operations. Specific warnings are more appropriately contained in technical manuals such as NAVFACENGCOM-460, *Elevated Causeway Facility Installation and Retrieval*, Commander Military Sealift Command Instruction (COMSCINST) 5100.17, the *MSC Safety Manual*, series, the T-ACS class mission operations handbooks, or the OPDS operations and maintenance technical manuals. This appendix will describe general safety considerations to be observed based upon operational experience and common sense.

2. Weather and Sea State

The effects of weather and sea state and guidelines for maximum acceptable sea states are contained in the main text and referred to in Appendix G, "Sea State, Weather, and Surf." The decision to terminate JLOTS operations based on forecast or actual weather and/or sea state rests with the JLOTS commander. The decision may cover all operations or selected weather and sea state sensitive operations. Additionally, civilian masters and/or debarkation officers or ship platoon commanders may terminate operations on individual ships if, in their judgment, weather and sea state are causing unsafe conditions. In this event, the action should be reported to the JLOTS commander immediately.

3. Pre-Joint Logistics Over-the-Shore Requirements

Before beginning any JLOTS evolution, certain standard safety procedures should be conducted as follows.

a. Brief personnel on the safety aspects and necessary precautions that must be considered for safe operations. When more than one operation takes place in parallel, personnel should be assured that the hazards of any one operation will not inadvertently affect any of the other operations.

b. Conduct an inspection to determine the physical condition of equipment.

c. Inspect all rigging to ensure it is proper for the work to be done.

d. Ensure that personnel who have been instructed and/or given written instructions do, in fact, understand these instructions; ensure that certifications for all operations requiring certified operators are current; and ensure that all lighterage crews are Class II swimmers.

e. Exercise all equipment (e.g., cranes, lighterage, ELCAS turntable) to ensure that it responds correctly to appropriate commands.

f. Ensure that all equipment operating stations are labeled with appropriate capacity limitations data.

g. Ensure that appropriate safety devices are used and worn and that safety procedures are followed for crane and welding operations.

h. Brief all personnel on the special safety procedures to be taken when working near diving operations.

i. Determine safe haven or a place where small craft can go to get out of sea states greater than their safe operating limits. This plan should include decision charts that allow for quick determination as to what to do with a piece of equipment on the water or near the surf zone in the JLOTS area. Emergency mooring systems should be identified and worked into this plan.

4. Safety Equipment and Clothing

Personnel engaged in JLOTS operations must be appropriately equipped to minimize the potential of being killed or injured while performing their duties. Life vests, exposure suits, cold weather gear, hardhats, safety shoes, and eye and ear protection may be required depending on the evolution being performed. Loose clothing should be avoided when working around equipment such as cranes and winches. Provisioning of personal safety equipment and clothing is a Service responsibility and will be provided under each unit table of organization and equipment.

5. Fire Protection

Fire prevention and control are achieved through a combination of sound safety practices and systems of detection and alarms and firefighting equipment. Sound practices include the strict enforcement of prohibitions against smoking, open flames, and spark-producing tools in and around areas where fire hazards exist. Also, good housekeeping practices such as prevention of accumulation of flammable debris should be followed. These practices are applicable on strategic sealift ships and lighterage and at shoreside receiving terminals such as ELCAS, OPDS BTUs, and rear fuel farms. Firefighting and damage control equipment are also extremely important. The strategic sealift ship and its crew are responsible for providing, maintaining, and operating this equipment onboard ship in accordance with US Coast Guard and MSC regulations. Lighterage and terminal crews are responsible for their respective systems. The equipment must be serviceable and crew members must be well trained in its operation. Frequent inspections must be conducted to ensure that the equipment is operable.

6. General Safety Responsibilities

Ship masters, craft masters, and terminal OICs have total responsibility for the safety of their ships, lighterage, facilities, and the crews that operate them. These duties are exercised by training, inspection, leadership, and discipline. A failure in the conduct of a safe operation jeopardizes the well-being of every individual aboard the ship or facility. Therefore, it is everyone's responsibility to act in a safe, responsible manner, performing every function as safely as possible. All personnel engaged in an operation are charged with the duty to immediately report to their supervisor any potential safety hazard or procedure that could produce an unsafe event or mishap. However, if an unsafe situation develops that does not permit time for reporting to a supervisor, anyone observing the condition should seek to have the evolution stopped.

7. Special Precautions

Most JLOTS operations, whether at the pier or beach or in the water, are hazardous. Water operations can be particularly dangerous because of adverse weather, operational task hazards, and adversary action. The efficiency of an operation may also be seriously curtailed by carelessness of personnel who permit dangerous conditions to exist or fail to repair faulty equipment. The following special precautionary steps should be taken to prevent accidents.

a. **Shipboard Safety.** Accidents aboard ship most frequently result from falls, explosions, falling objects, faulty electrical equipment, unsafe handling procedures, and lack of protection for the eyes and extremities. During beaching operations, crew members must wear life jackets except when in the engine room or in the bridge house handling the wheel. They should be accomplished swimmers qualified in lifesaving techniques. All lines on deck should be made up in such a manner that no one can get tangled in them or trip on them. Rigging must be properly stowed and frequently and properly inspected and maintained. All personnel should wear proper clothing and use correct tools and safety gear. The bilges should be checked regularly to make sure that the landing craft is not holed or taking on water through the hull connections. The presence of fuel or fuel fumes in bilges is a sign of a potential fire hazard and must be checked immediately.

b. **Bulk Fuel Products.** Oil and grease spillage should not be allowed to accumulate on decks; spillage should be wiped up as it occurs. Bilges will be kept clean of oil and other bulk fuel products to reduce fire hazards. Approved nonvolatile cleaning agents will be used for cleaning purposes. When fuel is being received on board, no bare lights, lighted cigarettes, or any electrical apparatus that have a tendency to spark should be permitted within 50 feet of an oil hose or fuel tank. Only spark-proof tools will be used to connect or disconnect fuel lines. Bulk fuel preventive measures include the following:

(1) **Firefighting Equipment.** Particular attention should be given to all firefighting and damage control gear aboard. The equipment must be serviceable and operational and crew members must know the operation and location of the equipment. Frequent inspections must be conducted to ensure that the equipment is operable.

(2) **Fire Prevention.** "No Smoking" signs will be posted wherever potential fire hazards exist. Smoking will be permitted only in designated areas.

c. **Cargo Operations.** Special attention must be given to the proper loading, blocking, and security of vehicles or other cargo to be carried in landing craft. The ship's master is responsible for these operations and cargo must be inspected prior to movement. Cargo operation safety measures include the following.

(1) Personnel must be warned never to stand beneath a draft of cargo or get between a draft of cargo and a bulkhead or other cargo. They must also be warned never to pull a cargo draft into position as they might slip and fall beneath the draft. The draft is always pushed into place.

(2) Crew members and terminal service personnel should watch for projections and loose bandings of cargo, frayed wire, or cargo to be recoppered or rebanded before being loaded aboard. Leaky drums will not be taken aboard as cargo.

8. Safety Hazard Areas

Various hazard situations and their prevention are described below.

a. **Embarkation and Debarkation.** Personnel embarkation and debarkation at ships moored offshore should only be conducted in sea state 3 or below. Normally, Jacob's ladders are the safest method for embarkation and debarkation in poor conditions.

b. **Barges.** Most barges have coamings less than 5 feet high. In poor conditions or during cargo loading, stevedores should stay well clear of barge sides or erect a taut line or handrail.

c. **Open Hatches.** Open hatches with less than 24 inches of coaming are extremely dangerous unless protected by a handrail. Handrails must be installed when such hatches are in use.

d. **Ships Gear.** Personnel should wear protective headgear and hearing protection, if required, when working with ships gear. The ship's officers should brief Army and Navy personnel on any special safety requirements.

e. **Chain, Wire Rope, Fiber Rope, Shackles, and Hooks.** All working gear must be certified and clearly marked. Terminal supervisors must constantly ensure that the correct equipment is being used and that stevedores know its limitations.

f. **Forklift Operations.** Forklifts should be fitted with lights, overhead protective guards, and audible warning devices. Personnel should stay well clear of operating forklifts because the operator is concentrating on the task and has restricted visibility.

APPENDIX M
UNIT CAPABILITIES

1. Overview

This appendix discusses the missions, assignments, capabilities, and major equipment holdings of various Army, Navy, Marine Corps, and Coast Guard units capable of supporting LOTS operations.

2. Navy Units

a. **Naval Beach Group.** The NBG will furnish the Navy elements to form the beach party group of the landing force support party, and will provide the JLOTS commander with beachmaster traffic control, pontoon lighterage, causeways, ship-to-shore bulk fuel systems, limited construction capabilities, landing craft, beach salvage capability and communications to properly command and control these specially equipped teams to facilitate the flow of troops, equipment, and supplies across the beaches. Strength levels and numbers of equipment will be based on the requirements of the appropriate operational commander, as designated in command OPORDs and OPLANs.

(1) An NBG is a commissioned Navy organization consisting of a commander, staff, and four Navy units — an ACB, a BMU, and two ACUs. The mission of the NBG is to put landing force equipment and supplies ashore during and following an amphibious assault or an MPF offload. The NBG is an administrative organization. For operational employment, the NBG is task-organized to accomplish specific tasks to conduct LOTS as part of the participating naval forces. Figure M-1 shows an operational organization to conduct JLOTS operations, some of whose units are composed of elements belonging to the NBG.

(a) **Function.** To provide the Navy elements to support the LOTS commander with beachmaster traffic control, lighterage, causeways, bulk fuel delivery, construction, landing craft, salvage, and communications to facilitate the flow of cargo across the beach.

(b) **Assignment.** To JLOTS commander.

(c) **Capabilities**

1. Direct and coordinate training and administration of NBG activities, including reserve NBG unit training.

2. Provide appropriate BMU, PHIBCB, and ACU components for duty as participating naval forces in support of JLOTS operations.

b. **Amphibious Construction Battalion.** The PHIBCB provides designated elements to the JLOTS commander, supports the naval forces during the initial assault and later phases of the LOTS operation, and assists the shore party. The PHIBCB provides a unit from which

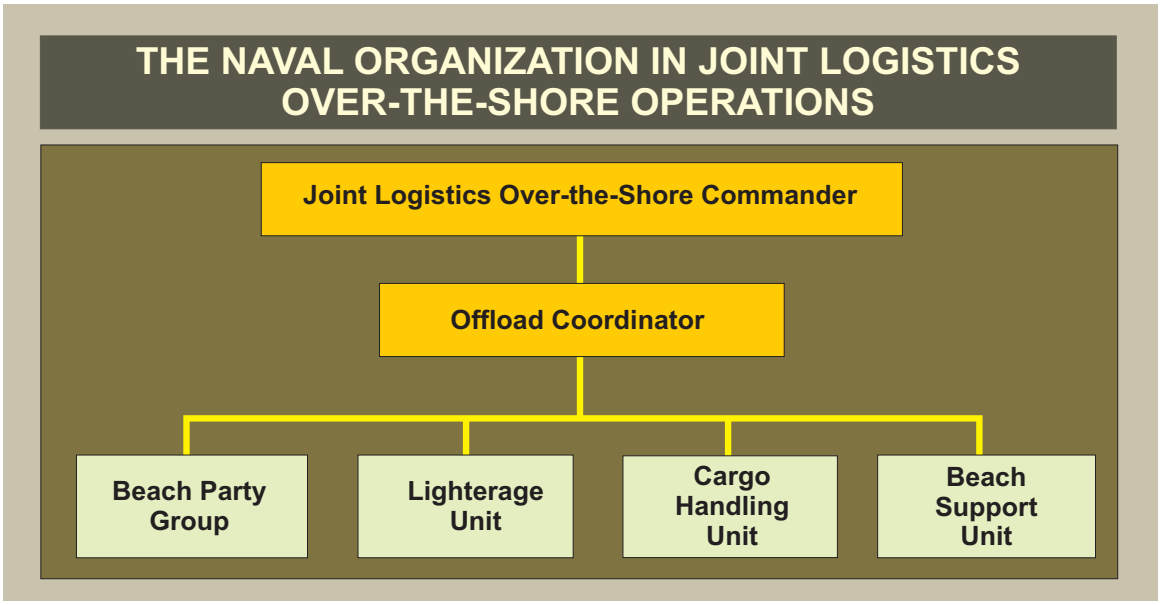


Figure M-1. The Naval Organization in Joint Logistics Over-the-Shore Operations

personnel and equipment are formed in tactical elements and made available to appropriate commanders to operate pontoon causeways, transfer barges, fuel transfer systems, warping tugs, and ELCAS and to assist in salvage requirements. An operational organization is shown in Figure M-2.

(1) **Function.** To provide elements to support the operation.

(2) **Assignment.** To NBG.

(3) **Capabilities**

(a) Install and operate CWPs, RRDF, and ELCAS.

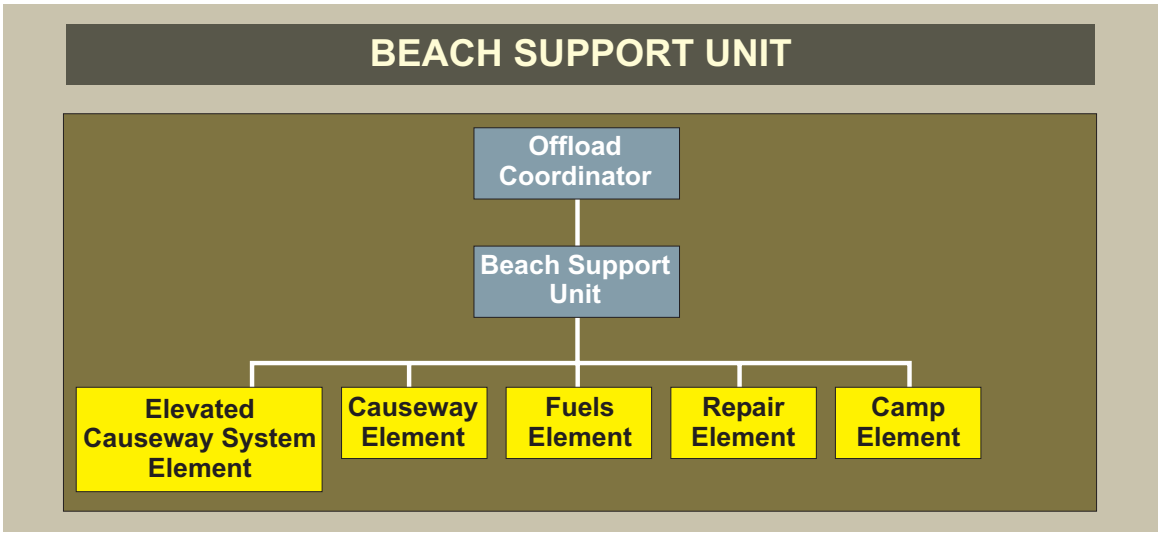


Figure M-2. Beach Support Unit

(b) Support limited construction and camp support elements.

(c) Operate pontoon lighterage elements.

(d) Install bulk liquid systems.

(e) Provide salvage support.

(f) Provide security and beach defense.

(g) Provide lighterage repair function.

(4) **Major Equipment.** General construction equipment (cranes, bulldozers, front-end loaders, and other construction equipment); lighterage such as CSNP, CSP, SLWT, RRDF, and ELCAS; SALM and hosereels.

c. **Beachmaster Unit.** The BMU will conduct beach party operations for JLOTS in order to facilitate landing and moving of troops, equipment, and supplies across the beach.

(1) **Function.** To conduct beach party operations to facilitate landing and moving of cargo across the beach.

(2) **Assignment.** To NBG.

(3) **Capabilities**

(a) Control landing ships, lighterage, and amphibious vehicles in the vicinity of the beach from surf line to high water mark.

(b) Determine and advise of suitability for landing of amphibious vehicles, craft, ships, and beaching causeways.

(c) Control salvage of lighterage.

(d) Provide limited assistance in local security and beach defense.

(e) Install causeway and LST beaching range markers and lights.

(f) Maintain observation of wind and surf conditions.

(g) Coordinate surf transit portion of reembarkation of equipment, troops, and supplies.

(4) **Major Equipment.** LARC-V.

d. **Assault Craft Units.** ACUs are commissioned units of the NBG that provide, operate, and maintain assault craft. The units may provide lighterage for LOTS operations as directed by higher authority. The ACU has no capability for advanced base functions ashore.

(1) **Function.** To provide, operate, and maintain assault craft to and for the ATF commander for ship-to-shore movement. The ACU will assist with operation and maintenance of lighterage for LOTS as directed by higher authority.

(2) **Assignment.** To NBG.

(3) **Capabilities**

(a) LCU, LCM, and LCAC support for ship-to-shore movement.

(b) Maintenance and support elements for intermediate-level craft repair ashore.

(c) Administrative control of LCU, LCM, and LCAC lighterage.

(4) **Major Equipment.** LCU, LCM-8, and LCAC.

e. **Navy Cargo Handling Force.** The NCHF is composed of 13 battalion-sized cargo handling units that are quick response combat support units specializing in open ocean cargo handling. The units are capable of worldwide deployment in their entirety or in specialized detachments. These units are organized, trained, and equipped to:

(1) Load and discharge Navy and Marine Corps cargo carried in MPS and merchant breakbulk and container ships in all environments.

(2) Operate an associated temporary ocean cargo terminal.

(3) Load and discharge Navy and Marine Corps cargo carried in military controlled aircraft.

(4) Operate an associated expeditionary air cargo terminal.

(5) The F1 cargo handling battalion (CHB) is a multi-mission unit composed of 8 officers and 145 enlisted personnel, plus the basic unit equipment required to provide technical and supervisory cargo handling capability to fleet and area commanders in support of worldwide naval operations. Unit equipment requirements beyond the basic allowance of personnel support equipment are provided to the CHB by one or more of the supplemental equipment packages (F1A through F1G) described below. These supplemental equipment packages are tailored to the specific mission environment and to the specific requirements of the mission. The utilization of these supplemental equipment packages provides the fleet commanders a wide variety of options in utilizing the CHBs.

(6) The following units have the capability of being assigned to the advanced base functional components (ABFCs) F1 functional mission.

(a) NAVCHAPGRU.

(b) Naval reserve cargo handling battalion.

(7) The NAVCHAPGRU is the active duty cargo handling battalion and is always available for utilization.

(8) The specific tasks of a CHB include, but are not limited to the following

(a) **MPS and AFOE Cargo Handling.** Providing skilled stevedores and C2 personnel capable of loading and discharging (either in-stream or pierside) commercial and MSC cargo ships associated with an MPS or AFOE operation.

(b) **Heavy Lift Marine Crane Operators.** Providing shipboard heavy lift crane operators for MPS, containership, T-ACS, and other specialized operations.

(c) **Total Cargo Class Responsibility.** Providing stevedores and C2 personnel capable of loading and discharging all classes of cargo, including munitions, in a developed or nondeveloped port or in-stream.

(d) **Limited Ocean Terminal.** Providing managerial and technically skilled personnel capable of operating a limited marine-cargo terminal in support of ship loading and discharging operations.

(e) **Limited Air Terminal.** Providing managerial and technically skilled personnel capable of loading and discharging cargo from commercial and military aircraft and operating a limited air cargo terminal.

(f) **Self-Supporting.** Providing own services to sustain the administration, messing, berthing, limited construction, organizational level maintenance, and repair requirements of the F1 ABFC unit.

(9) CHBs operate most effectively when employed solely in ship loading and discharge operations and when each of the 16 hatch teams is augmented by sufficient numbers of unskilled personnel from the supported activity to satisfy actual loading/offload requirements. Using a planning factor of 112 personnel augments (7 per hatch team) provided from the supported unit, the CHB can achieve a 2,800 measurement tons per day (MT/D) discharge rate alongside the pier and a 1,920-MT/D discharge rate in-stream. If the CHB is not augmented, the discharge rates must be reduced by 50 percent (1,440 MT at pierside and 960 MT in-stream).

(10) The required number of ABFC F1 units is directly dependent on

(a) Tonnage to be handled.

(b) Discharge scheduling and discharge rate desired.

(c) Number of vessels and aircraft to be discharged and loaded.

(d) Available pier and related facilities (pierside operations).

(e) Lighterage and related facilities (in-stream operations).

(f) Available indigenous labor.

(g) Available unskilled labor augmentation.

(h) Available mechanized cargo handling equipment (may be attained by utilizing a supplemental equipment package or combination of packages [F1A through F1G]).

(11) The F1 CHB and its associated supplemental equipment packages (F1A through F1G) provide the widest possible flexibility in the employment of CHBs. The NAVCHAPGRU and the naval reserve cargo handling force staff are available to provide fleet and area commanders with technical planning assistance in programming F1 CHBs into specific mission scenarios.

(a) For planning purposes, the F1 CHB may be programmed with a variety of equipment packages tailored to specific mission scenarios.

(b) **F1 — CHB Personnel and Core Equipment.** This package provides the personnel and basic personnel support equipment required to work all cargo handling situations. This package is required for all scenarios. Supplemental equipment packages (added on to the basic F1 unit above to meet the environmental and requirements of specific missions) follow:

1. **F1A — Expanded Core Equipment Package.** This package provides the equipment necessary to support one CHB in mission scenarios other than MPS scenarios. This equipment package must be provided to all mission scenarios other than MPS scenarios.

2. **F1B — Cargo Handling Civil Engineering Support Equipment (CESE) Package.** This package provides the CESE (trucks, trailers, and other support equipment) necessary to support a CHB in establishing or augmenting a port. This package should be provided to a battalion in all ports where CESE is not locally available. (Note: This package provides the CESE for pier, terminal, and local delivery operations. It does not provide a line-haul capability).

3. **F1C — Cargo Handling MHE Package.** This package provides the Naval Supply Systems Command MHE (forklifts and other handling equipment) necessary to support an F1 CHB in a port where MHE is not locally available.

4. **F1D — Container Handling Crane and Equipment Package.** This package provides the mobile crane container handling forklift and associated equipment necessary to support an F1 CHB in a port that does not have locally available container-handling facilities and where it is desired that the CHB offload and load container ships and operate a container marshalling yard adjacent to the ocean terminal.

5. **F1E — Air Cargo MHE Equipment Package.** This package provides the equipment necessary to support one detachment of an F1 CHB in the operation of an air cargo terminal. This equipment package should be programmed into all scenarios where it is expected that the F1 CHB will be required to operate an air terminal. If air terminal operations require more than one detachment of the F1 CHB, then one F1E equipment package must be provided for each detachment.

6. **F1F — Expeditionary Tent Camp Equipment.** This package provides all the equipment necessary for one F1 CHB to establish and operate an austere expeditionary camp to provide berthing and messing for its personnel. This package should be provided to each F1 CHB in all scenarios where berthing and messing is not provided by another activity or ABFC unit.

7. **F1G — Camp Support CESE.** This package provides the CESE necessary to construct and maintain an austere expeditionary tent camp to billet and subsist one F1 CHB. This package contains only the camp support equipment to be used in cargo handling operations as listed under the F1B supplemental package.

(12) **Basic F1 CHB Missions.** Although the F1 CHB is a multi-mission unit with a wide variety of possible missions, there are three major scenarios that the battalion is normally programmed to accomplish. They are as follows.

(a) **Maritime Pre-positioning Ships Support.** The F1 CHB provides the personnel and equipment necessary to provide technical and supervisory cargo handling capabilities to fleet and area commanders in support of the MPS program. The F1 component provides the skilled stevedores and C2 personnel capable of loading and discharging commercial and MSC ships in both an open ocean and pierside environment. Component personnel and organic equipment are transported by AMC as part of the fly-in echelon of the naval support element to the selected beach or port where the MPS squadron has been deployed. Each MPS squadron consists of four or five specially configured merchant ships that carry the majority of combat equipment and 30 days of supplies for a forward-deployed MEB. Hatch boxes with cargo handling equipment are pre-positioned onboard each of the ships. Each MPS squadron requires two F1 CHBs to provide discharge of the cargo in-stream or pierside within the currently required timeframes based on a planning factor of 112 Marines providing augmentation. Upon completion of the MPS offload, one F1 CHB may be retained on site to provide continuing or

resupply cargo discharge services, while the other CHB may be redeployed to another cargo handling mission. Both CHBs will require additional equipment from one or more of the supplemental equipment packages (F1A through F1G), depending on the subsequent mission assignments. Planning guidance includes the following packages for the MPS mission:

1. Two F1 CHBs for each MPS squadron (no additional supplemental equipment packages are required for the MPS mission); and

2. A total of 224 personnel from the supported Marine Corps unit to augment the CHBs.

(b) **Assault Follow-On Echelon Mission Support.** Each F1 CHB is capable of discharging cargo to support one half of a MEF within the required timeframes when augmented by the F1A expanded core equipment package. The required multiples of the F1 CHB (four each CHBs for a MEF level AFOE) plus the required quantities of the supplemental equipment packages (four each F1A packages for the MEF-level AFOE mission) provide the required technical and supervisory cargo handling capabilities to fleet and area commanders in support of Marine Corps assault operations (MEF). The AFOE carries sufficient equipment and supplies to sustain 60 days of combat and consists of unit equipment and supplies that are not essential for the initial amphibious assault. Component personnel and organic equipment accompany the AFOE to the AOR. Marine Corps personnel will augment the F1 CHB in the unskilled positions at an agreed upon level sufficient to support a MEF-level AFOE. The NBG will provide required CESE, MHE, and messing and berthing for the CHB under the AFOE scenario by means of TOA number 56 (TA-56). Planning guidance for the AFOE mission provides that the number of F1 CHBs and the required number of F1A supplemental equipment packages depend on the size of the AFOE: MEF-level AFOE requires four F1 CHBs, four F1A expanded core equipment packages, and a planning factor of twice the number of personnel from the supported unit required for augmenting 16 hatch teams.

(c) **Port or Terminal Operation Augmentation of Establishment.** When provided with the necessary supplemental equipment packages based on the specific environment and the required personnel, the F1 CHB provides the unit with equipment, skilled stevedores, and C2 personnel to augment or establish a port operation with a basic palletized cargo discharge rate of 2,880 MT/D. Specific tasks of the CHB include, but are not limited to the following.

1. **Cargo Handling.** Providing stevedores and C2 personnel capable of offloading and discharging commercial and MSC ships, including munitions handling, in a developed port. When all palletized cargo handling operations are pierside, the discharge rate will be 2,880 MT/D. When all cargo handling operations are in-stream, the discharge rate will be 1,920 MT/D.

2. **Ocean Cargo Terminal.** Providing 35 managerial and skilled technical personnel capable of operating a temporary ocean cargo terminal associated with the ship discharge. The maximum throughput rate of the marine terminal will be 240 MT per hatch team per day and the rate of the ship's discharge will be reduced accordingly.

3. **Limited Air Terminal.** Providing a detachment of 15 managerial and skilled personnel to operate a limited air cargo terminal. The detachment provides the battalion with the capability of sustaining around-the-clock operations at the limited air cargo terminal. The establishment of the limited air cargo terminal will reduce the ship discharge rate to 2,700 MT/D pierside and to 1,800 MT/D in-stream. The establishment of a limited air cargo terminal requires one F1E supplemental equipment package.

4. **Crane Operators.** Providing 32 heavy-lift crane operators for containerships, T-ACS vessels, or other special operations. The discharge rate of T-ACS vessel operations is 48 containers per day (12 hours) per hatch team pierside and 36 containers per day (12 hours) per hatch team in-stream.

5. **Mobile Shore and/or Container Crane Operations.** Providing 12 mobile shore crane operators to offload containers pierside or to operate a terminal marshalling yard. The assignment of the mobile shore container crane task requires the addition of an F1D container handling crane and equipment package to the F1 CHB.

6. **Expeditionary Tent Camp.** The F1 CHB is capable of providing its own messing, berthing, and limited base-support functions for short periods of time (less than 90 days) when provided with the F1F expeditionary tent camp supplemental equipment package.

7. **Planning Guidance for Port Establishment Augment Operations.** The following components must be programmed for each 2,880 MT of cargo desired discharged daily in-stream:

a. One F1 CHB.

b. One F1A expanded core equipment package.

c. One F1B cargo handling CESE package (must be provided only when adequate CESE is not locally available in the port).

d. One F1D container handling crane and equipment package (must be provided if container-handling operations are desired and container-handling equipment is not available in the port).

e. One F1E air cargo MHE equipment package (must be provided when a limited air cargo terminal is planned and there is not sufficient air cargo MHE available locally).

f. One F1F expeditionary tent camp equipment package and one F1G camp support CESE package (must be provided if messing and berthing is not locally available or is not being provided by another command).

(13) **Assignment.** To NBG.

(14) **Capabilities**

(a) Figure M-3 provides CHB productivity factors.

CARGO HANDLING BATTALION PRODUCTIVITY FACTORS

	Per-Hour Per Hatch Team (14 Men) 1/	Per-12-Hour Per Hatch Team (14 Men) 2/
Pier Discharge		
Palletized Cargo	15.0 MT	180 MT
Breakbulk Cargo	6.2 MT	75 MT
Mixed Cargo	10.6 MT	130 MT
Pier Ship Loading		
Palletized Cargo	8.8 MT	105 MT
Breakbulk Cargo	4.1 MT	50 MT
Mixed Cargo	6.4 MT	75 MT
In-stream Ship Discharge		
Palletized Cargo	10.0 MT	120 MT
Breakbulk Cargo	5.6 MT	70 MT
Mixed Cargo	7.8 MT	95 MT
In-stream Ship Loading		
Palletized Cargo	6.7 MT	80 MT
Breakbulk Cargo	3.6 MT	45 MT
Mixed Cargo	5.7 MT	60 MT
Container, T-ACS, Jumbo Rig, Heavy Lift Operations		
Pier Load and/or Discharge	4 Containers (128 MT)	48 Containers (1,536 MT)
Stream Load and/or Discharge	3 Containers (96 MT)	36 Containers (1,152 MT)
Ocean Terminal (Palletized Cargo)		
Throughput (Receive and Issue)	20 MT	240 MT 480 MT
One Way (Receive and Issue)	40 MT	
Air Terminal (Measured in pounds vice MT) (463L max weight is 10,000 lbs)	6,666 LBS (1-463L Plt)	80,000 LBS (10-11 463L Plt)
Pier Operation	45 MT	540 MT

1/ All per-hour figures are rounded to nearest .1 measurement ton (MT).
2/ All per-12-hour figures are rounded to nearest 5 MT.

Figure M-3. Cargo Handling Battalion Productivity Factors

(b) Figures M-4 through M-7 are the CHB Utilization Tables. Note the following: First, 16 Hatch teams assume augmentation of 112 personnel based on a planning factor of 7 per hatch team. Without augmentation, the cargo is reduced by 50 percent. Second, these figures assume palletized-cargo capacity. Rough conversion factors for other classes of cargo are:

1. Breakbulk — 50 percent of the palletized cargo capacity.

2. Mixed cargo — 75 percent of the palletized cargo capacity. Third, ship operations — divide hatch team by four to determine the number of hatch teams working each ship on each shift (e.g., 2 ships, 16 hatch teams mean 4 hatch teams per shift per ship).

SHIP DISCHARGE OF PALLETIZED CARGO[1/]					
	PIER SIDE	IN-STREAM	PIER TEAM	OCEAN TERMINAL	AIR TERMINAL
2 ship	2,880 (16 HT)[2/]	0	0	0	0
2 ship	2,160 (12 HT)	0	2,160 (4 HT)	0	0
1 ship	1,440 (8 HT)	0	1,620 (3 HT)	1,200 (5 HT)	0
1 ship	1,260 (7 HT)	0	1,620 (3 HT)	1,200 (5 HT)	80,000 lbs (1 HT)
2 ship	0	1,920 (16 HT)	0	0	0
1/ In measurement ton (unless otherwise indicated). 2/ HT=Hatch Team.					

Figure M-4. Ship Discharge of Palletized Cargo

SHIP LOADING OF PALLETIZED CARGO[1/]					
	PIER SIDE	IN-STREAM	PIER TEAM	OCEAN TERMINAL	AIR TERMINAL
2 ship	1,680 (16 HT)[2/]	0	0	0	0
2 ship	1,365 (13 HT)	0	1,620 (3 HT)	0	0
1 ship	1,050 (10 HT)	0	1,080 (2 HT)	960 (4 HT)	0
1 ship	1,050 (10 HT)	0	1,080 (2 HT)	720 (3 HT)	80,000 lbs (1 HT)
2 ship	0	1,280 (16 HT)	0	0	0
1/ In measurement ton (unless otherwise indicated). 2/ HT=Hatch Team.					

Figure M-5. Ship Loading of Palletized Cargo

CONTAINER LOADING AND DISCHARGE USING AUXILIARY CRANE SHIPS, MARITIME PRE-POSITIONING SHIPS, SHORE CRANES, AND OTHER APPROPRIATE FACILITIES[1/]					
	PIER SIDE	IN-STREAM	PIER TEAM	OCEAN TERMINAL	AIR TERMINAL
2 ship	768 (16 HT) (24,576 MT)	0	0	0	0
2 ship	576 (12 HT) (18,432 MT)	0	576 (4 HT) (18,432 MT)	0	0
2 ship	432 (9 HT) (13,824 MT)	0	432 (3 HT) (13,824 MT)	432 (4 HT) (13,824 MT)	0
2 ship	384 (8 HT) (12,280 MT)	0	432 (3 HT) (13,824 MT)	432 (4 HT) (13,824 MT)	80,000 lbs (1 HT) (50 MT)
2 ship	0	576 (16 HT) (18,432 MT)	0	0	0
1/ Measured in numbers of containers. MT = measurement ton HT = Hatch Team					

Figure M-6. Container Loading and Discharge Using Auxiliary Crane Ships, Maritime Pre-positioning Ships, Shore Cranes, and Other Appropriate Facilities

f. **Navy Underwater Construction Team.** The Navy UCTs are subordinate to the Commander, Naval Construction Force. UCTs perform harbor, coastal, and ocean construction diving to a maximum depth of 190 feet of seawater (FSW) using scuba or surface-supplied diving systems. UCTs are capable of underwater welding, cutting, precision blasting, light salvage, and limited ship-husbandry tasks. The UCTs can conduct detailed, engineering level hydrographic/bathymetric and geotechnical surveys during any phase of the JLOTS operation; particularly pre-site surveys. They can conduct surface and subsurface battle damage assessment/ battle damage repair. UCTs will also support the installation and maintenance of subsurface security devices. They are experienced in construction, repair, and installation of submarine cables, pipelines, moorings, and marine structures. The UCTs can conduct convoy operations and provide internal force protection if not conducting diving operations. Force protection capability is minimal while conducting diving operations. For the deployment and retrieval of the OPDS, UCTs

(1) Perform underwater SALM site surveys and conduit installation route survey.

(2) Assist PHIBCBs in the installation and stabilization of the flexible submarine product conduit for all joint units.

(3) Ballast SALM, connect product hoses, and set product valves.

NOTIONAL PERSONNEL ASSIGNMENTS						
Available	=	145 (CHB)	+	112 (Augmentees)	=	257 (2 ships, 2 shifts)
	Hatch Teams (224 personnel)					
		Hatch Captain		1		
		Hold Boss		1		
		Crane and Winch Operator		2		
		Signalman		1		
		Forklift Operator		2		
		Stevedores (augmented)		7		
				14 per hatch team		
		C2				
		Technical Supervisor		1		
		Ship Supervisor		2		
		Status Center Watch		2		
		Communications and or Security		2		
		Duty Corpsman		2		
				9 per shift = 18 per battalion		
		Support Personnel				
		Mechanics		2		
		Corpsmen		2		
		Cooks		6		
		Camp Support		3		
		Administration		2		
				15 per battalion		

Figure M-7. Notional Personnel Assignments

(4) Disconnect product conduits underwater in depths of up to 190 FSW. (This depth requirement, coupled with the requirement for voice communication with the diver, mandates that the diving operations be conducted using surface-supplied methods. Surface-supplied diving also enhances the diver's effectiveness over a broader range of environmental conditions. In addition to surface-supplied diving equipment [compressors, control consoles, and other diving equipment], a recompression chamber is required.)

(5) De-ballast SALM, reset product valves underwater, and unfoul SALM before blowing voids, if necessary.

3. Army Units

a. **US Army Transportation Composite Group (TOE 55-622L)**

(1) **Function.** Command and control units that provide transportation services for an independent division-sized force, or for a two division separate corps force, or which provide transportation services on an area basis supporting a larger force.

(2) **Assignment.** To a headquarters commanding an independent division-sized force; to the corps, with assignment to the corps support command when supporting a two-division separate corps force; or to a theater army, with attachment to a transportation command when providing support to a larger force.

(3) **Capability.** Commands, controls and technically supervises three to seven battalions and their assigned/attached units.

b. **US Army Transportation Terminal Battalion (TOE 55-816L)**

(1) **Function.** Commands and controls, and provides planning, and technical supervision of attached units operating water terminals (fixed port or logistics-over-the-shore).

(2) **Assignment.** To a Transportation Command; normally attached to a transportation composite group. The battalion may operate separately under the supervision of an appropriate commander.

(3) **Capabilities.** Commands and controls, plans, and technically supervises attached units for discharging or backloading (or a combination thereof) up to four ships simultaneously at an established fixed port or up to two ships simultaneously at a LOTS site. Provides command and control elements for inland waterway and amphibious operations.

c. **Transportation Cargo Transfer Company (TOE 55-819L).** Company organization is shown in Figure M-8.

(1) **Function.** To discharge, load and transship cargo at air, rail or truck terminals; to discharge, load and transship cargo at water terminals located in fixed ports or in LOTS operations; and to supplement cargo/supply handling operations at CSS activities in corps or division areas.

(2) **Assignment.** To a transportation composite group or to a Corps Support Command when supporting independent corps operations. Normally attached to a transportation terminal battalion or transportation motor transport battalion.

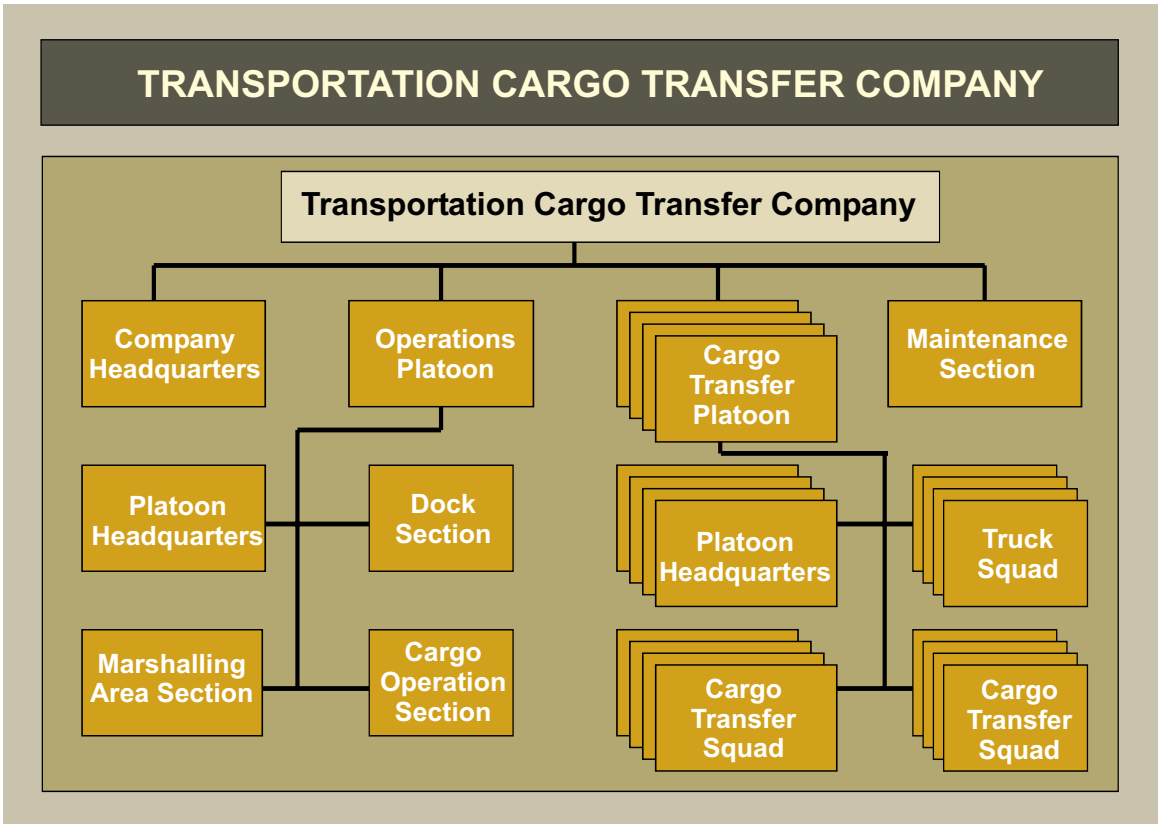


Figure M-8. Transportation Cargo Transfer Company

(3) **Capabilities.** The unit can operate up to four rail, truck or air terminals on a 24-hour basis per day. Requires augmentation of a POCD (TOE 55-560LF) and an automated cargo documentation detachment (TOE 55-56-LD) when operating an ocean terminal.

(4) In LOTS operations, augmented by a POCD, can accomplish one but not all of the following.

(a) Discharge or load 300 containers. In simultaneous operations move 150 containers in each direction.

(b) Discharge or load 1,500 STs of breakbulk cargo. In simultaneous operations move 750 STs in each direction.

(c) Discharge or load 350 vehicles from/to a RO/RO ship.

(5) **In Fixed Port Operations**

(a) Given a container ship and pierside cranes, discharge or load 500 containers per day or combination thereof.

(b) When augmented by the POCD, discharge or load 2,500 STs of breakbulk cargo. In simultaneous operations, move 1,200 STs in each direction.

(c) Discharge up to 1,000 vehicles or load up to 750 vehicles from or onto a RO/RO ship.

(6) During container operations can stuff and unstuff containers, however this capability degrades other capabilities.

(7) At inland terminals can perpetuate cargo documentation and redocument diverted or reconsigned cargo.

(8) **Major Task Equipment**

(a) Sixteen 50,000-lb Rough Terrain Cargo Handler.

(b) Sixteen 10,000-lb All Terrain Lifter Army System forklift truck.

(c) Eight 4,000-lb rough terrain forklift truck.

(d) Eight 40-ton Rough Terrain Container Crane.

(e) Sixteen 20-foot container tophandler.

(f) Eight 40-foot container tophandler.

(g) Sixteen 20-foot container spreaderbar

(h) Eight 40-foot container spreaderbar.

(i) Eight 5-ton yard tractor truck.

(j) Thirty-two 34-ton flatbed semitrailer.

(k) Eight 5-ton tractor truck.

(l) Four Heavy Equipment Transport tractor truck.

(m) Four 70-ton lowbed semitrailer.

d. **Transportation Port Operations Cargo Detachment (TOE 55-55-560LF)**

(1) **Function.** Provides terminal operation services to discharge and load breakbulk cargo and containers in fixed ports or LOTS sites.

(2) **Assignment.** To the Transportation Command or Corps Support Command; attached to a transportation terminal battalion, transportation motor battalion, or corps support battalion.

(3) **Capabilities.** The detachment augments the transportation cargo transfer company (CTC) (TOE 55-819L) to load or discharge equipment and supplies in a water port and requires personnel from the CTC to perform sustained 24-hour operations.

(4) **In LOTS Operations**

(a) Discharge or load 1,500 STs of breakbulk cargo. In simultaneous operations move 750 STs in each direction.

(b) Discharge or load 300 containers. In simultaneous operations move 150 containers in each direction.

(5) **In Fixed Port Operations**

(a) Given a crane ship and pierside cranes, discharge or load 500 containers per day or combination thereof.

(b) Discharge or load 2,500 STs of breakbulk cargo and in simultaneous operations, move 1,250 STs in each direction.

(6) As follow-on units or contract support/host-nation support under SDDC assume cargo handling operations at the SPOD during the sustainment phase and theater development, the POCD is task-organized to continue work with SDDC or another support activity.

(7) **Major Task Equipment**

(a) Three 140-ton truck-mounted cranes.

(b) Six electric 6,000-lb forklift trucks.

(c) Four electric 4,000-lb forklift trucks.

e. **US Army Transportation Medium Boat Company (TOE 55-128H5).** Company organization is shown in Figure M-9.

(1) **Function.** To provide and operate landing craft for the movement of personnel and cargo in water terminal operations and to augment, when required, naval craft in joint amphibious operations.

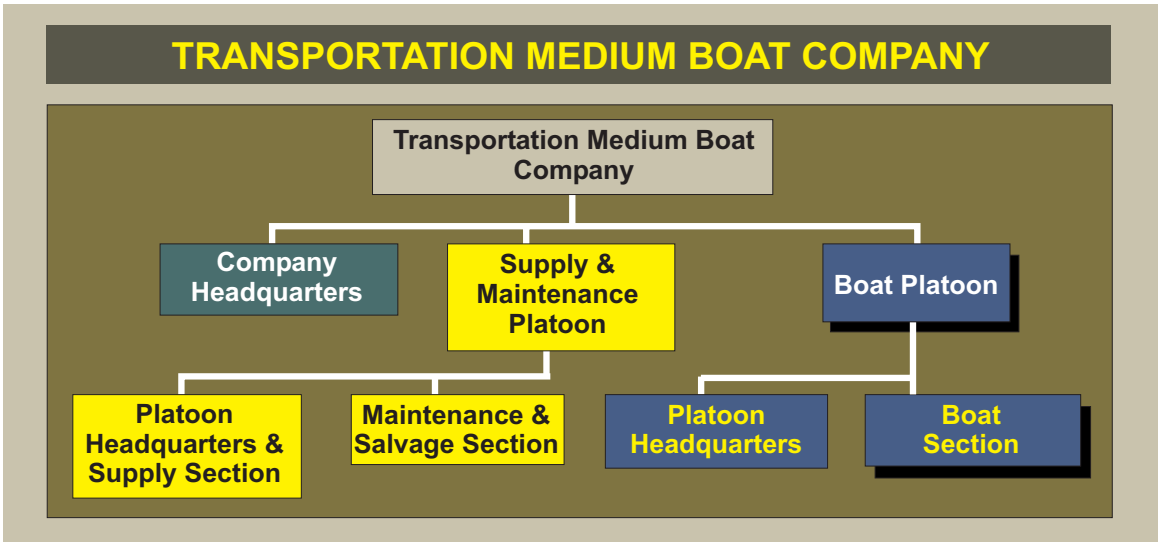


Figure M-9. Transportation Medium Boat Company

(2) **Assignment.** To provide command support in a theater of operations, the company is normally attached to a transportation terminal battalion (TOE 55-816L) or a transportation terminal composite group (TOE 55-622L).

(3) **Capabilities.** For planning purposes, operating on a 24-hour basis, with a 75 percent availability of equipment, operational capabilities of the unit are as indicated. At full strength, this unit is capable of the following.

(a) Transporting an average of 1,000 STs of non-containerized cargo with 12 landing craft, each carrying an average of 42 STs twice daily.

(b) Transporting 240 TEU containers per day with 12 landing craft, each carrying 1 container and making 20 trips daily.

(c) Transporting 960 STs of non-containerized cargo or transporting 3,200 combat-equipped troops, based on 16 landing craft in a one-time lift.

(4) **Major Task Equipment.** Eighteen LCM-8.

f. **US Army Transportation Heavy Boat Company (TOE 55-829L).** Company organization is shown in Figure M-10.

(1) **Function.** To provide and operate landing craft for transporting personnel, containers, and outsized cargo in offshore discharge operations and for augmenting lighterage service.

(2) **Assignment.** To a Transportation Command. Normally attached to a transportation terminal battalion (TOE 55-816L), or a transportation composite group (TOE 55-622L). The

company may be attached in support of a joint amphibious operation or may operate separately under an appropriate commander.

(3) **Capabilities.** At full strength, operating on a 24-hour basis, this unit is capable of the following.

(a) Transports an average of 1,600 STs of non-containerized cargo when each LCU makes 1.5 trips daily.

(b) Transports an average of 288 TEU containers when each LCU makes 7.2 trips daily.

(c) Transports, in a one-time maximum lift, 3,200 combat equipped troops when each LCU makes one trip daily.

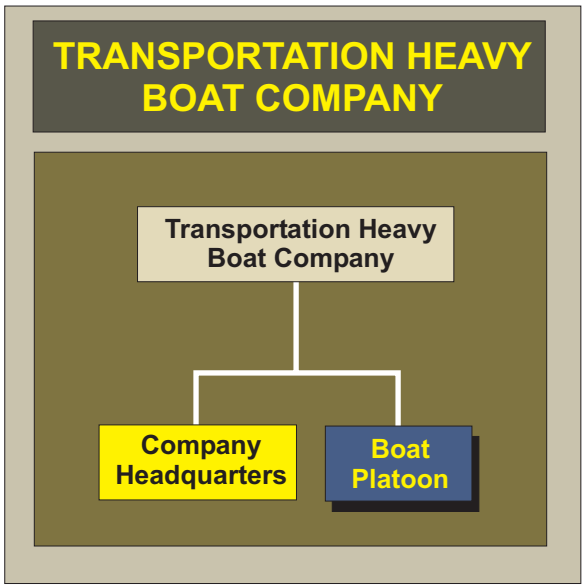


Figure M-10. Transportation Heavy Boat Company

(d) May be assigned missions requiring a single LCU or more.

(4) **Major Task Equipment.** Ten LCUs.

g. **Transportation Harbormaster Operations Detachment (TOE 55-887)**

(1) **Function.** Provides operational control for vessels and harborcraft operations and related functions within a water terminal operation area, fixed port or LOTS on a 24-hour basis.

(2) **Assignment.** Assigned organic to the transportation composite group and normally attached to a transportation terminal battalion.

(3) **Capabilities.** Provides personnel and equipment to simultaneously operate a LCC, two SLCP, and two BLCP. Provides long- and short-range communications with vessels from a shore based location. Perform harbormaster functions in a fixed port.

h. **US Army Transportation Watercraft Teams (TOE 55-530H).** All teams are capable of 24-hour operations and are allocated as required.

(1) **Team D, Small Tug, Inland/Harbor**

(a) **Function.** To provide tug services in support of terminal and inland waterway operations.

(b) **Assignment.** To a transportation command and attached to a transportation terminal battalion (TOE 55-816L).

(c) **Capabilities.** Moves or tows lighterage, causeway piers, RRDFs, and barges in harbors, inland waterways, and along coastlines. Assists in fire fighting, berthing, patrolling, and general utility such as docking and undocking ships and barges, movement of floating cranes, and line-handling duties.

(2) **Team C, Deck or Liquid Cargo Barge, 120-Foot, Nonpropelled**

(a) **Function.** To transport deck-loaded dry cargo or bulk liquid cargo.

(b) **Assignment.** Same as Team D above.

(c) **Capabilities.** Transporting up to 4,160 barrels of liquid cargo or up to 587 STs of dry cargo when under tow.

(3) **Team E, Barge Crane, 100-Ton**

(a) **Function.** To load and discharge heavy-lift cargo that is beyond the capability of ship's gear.

(b) **Assignment.** Same as Team D above.

(c) **Capabilities.** Making individual lifts up to 100 STs.

(4) **Team I, Large Tug, Inland/Coastal**

(a) **Function.** To provide tug services in support of terminal, inland waterway, coastal and intra-theater towing mission requirements.

(b) **Assignment.** Same as Team D above.

(c) **Capabilities.** Self-deliverable to a theater of operations and provides ocean and coastal tows of barges and ships, waterborne firefighting services, ship docking and undocking, salvage and recovery operations, and general purpose harbor duties.

(5) **Team J, Logistics Support Vessel**

(a) **Function.** To engage in the intratheater line haul of cargo to support unit deployment and relocations in a theater of operations in a port-to-port operation. The LSV also has a payload of 2,000 STs in a beaching operation (1:30 gradient).

(b) **Assignment.** Same as Team D above.

(c) **Capabilities.** Transports 1,500 to 2,000 STs of cargo consisting of vehicles, containers and general cargo; has a RO/RO capability.

i. **US Army Transportation Terminal Service Teams (TOE 55-56052)**

(1) **Team LA, Cargo Documentation**

(a) **Capabilities.** Performs documentation required in the loading and discharging of 500 STs of general cargo or 480 containers daily in a water terminal, railhead, truckhead, or airhead.

(b) **Basis of Allocation.** One per 500 STs of general cargo or 480 containers to be documented daily.

(2) **Team LC, Transportation Contract Supervision**

(a) **Capabilities.** Arranges for the loading or discharging of cargo from ships or barges and the clearance of discharged cargo from the terminal by contract; arranges for the movement of cargo from terminals, depots, or local procurement sources by inland waterways and highway transport contracts. Team LC also administers contracts made in connection with the loading, discharging, terminal clearance, and transport of cargo.

(b) **Basis of Allocation.** One or more per transportation terminal brigade or group or area command, as required.

(3) **Team JF, Container Handling, Ship**

(a) **Capabilities.** Provides personnel and equipment to handle 240 containers daily (2 cranes on a 1-shift basis) at a water terminal or provides personnel and equipment to handle 100 containers daily on a 1-shift basis at a JLOTS site (using 2 cranes, 1 at ship side and 1 at the beach). This team also provides limited organizational maintenance to the supporting unit.

(b) **Basis of Allocation.** As required.

(4) **Team LD, Automated Cargo Accounting Detachment**

(a) **Capabilities.** Capable of documenting by WPS breakbulk or container cargo being loaded or discharged from up to four ships in a fixed-port operation or two ships in a JLOTS operation.

(b) **Basis of Allocation.** As required.

(5) **Team LB, Freight Consolidation and Distribution Team**

(6) **Capabilities.** Processes 100 less-than-carload shipments daily in a consolidation and distribution point, barge site, air, rail, truck, or water terminal; Stuffs or unstuffs twenty-five 20-foot containers daily.

j. **US Army Transportation Terminal Service Teams (TOE 55-56052)**

(1) **Team JB, Cargo Documentation**

(a) **Capabilities.** Performs documentation required in the loading and discharging of 500 STs of general cargo or 480 containers daily in a water terminal, railhead, truckhead, or airhead.

(b) **Basis of Allocation.** One per 500 STs of general cargo or 480 containers to be documented daily.

(2) **Team JD, Transportation Contract Supervision**

(a) **Capabilities.** Arranges for the loading or discharging of cargo from ships or barges and the clearance of discharged cargo from the terminal by contract; arranges for the movement of cargo from terminals, depots, or local procurement sources by inland waterways and highway transport contracts. Team JD also administers contracts made in connection with the loading, discharging, terminal clearance, and transport of cargo.

(b) **Basis of Allocation.** One or more per transportation terminal brigade or group or area command, as required.

(3) **Team JE, Cargo Hatch Gang**

(a) **Capabilities.** Provides personnel and equipment to handle 100 STs of cargo daily on a one-shift basis in a water terminal.

(b) **Basis of Allocation.** As required.

(4) **Team JF, Container Handling, Ship**

(a) **Capabilities.** Provides personnel and equipment to handle 240 containers daily (2 cranes on a 1-shift basis) at a water terminal or provides personnel and equipment to handle 100 containers daily on a 1-shift basis at a JLOTS site (using 2 cranes, 1 at ship side and 1 at the beach). This team also provides limited organizational maintenance to the supporting unit.

(b) **Basis of Allocation.** As required.

(5) **Team JG, Container Handling, Shore**

(a) **Capabilities.** Provides personnel and equipment to transship 120 containers at a water terminal or to transship 100 containers from the shore crane to the container marshalling area and to operate the container marshalling area on a 1-shift basis.

(b) **Basis of Allocation.** As required.

(6) **Team JH, Breakbulk Augmentation (Container)**

(a) **Capabilities.** Capable of discharging 1,000 STs of breakbulk cargo per day or backloading 500 STs of breakbulk cargo per day when attached and integrated into operations of a transportation terminal service company (container).

(b) **Basis of Allocation.** As required.

(c) **Major Task Equipment.**

1. Four 20-ton wheel-mounted cranes.

2. Five RT 10,000-lb forklift trucks.

3. Three electric commercial 4,000-lb forklift trucks.

(7) **Team JI, Automated Cargo Accounting Detachment**

(a) **Capabilities.** Capable of documenting by WPS breakbulk or container cargo being loaded or discharged from up to four ships in a fixed-port operation or two ships in a JLOTS operation.

(b) **Basis of Allocation.** As required.

(8) **Team JJ, Heavy Crane Platoon**

(a) **Capabilities.** This unit, on a two-shift basis, provides:

1. Personnel and equipment to handle 400 containers in a fixed-port operation;

2. Personnel and equipment to handle 200 containers in a JLOTS operation; and

3. Organizational maintenance on organic equipment, less communication and electronic equipment, and direct support maintenance on container handling equipment.

(b) **Basis of Allocation.** As required.

(c) **Major Task Equipment.**

1. Two 140-ton container-handling truck-mounted cranes.

2. Two 250- to 300-ton container-handling truck-mounted cranes.

k. **Engineer Combat Battalion, Heavy (TOE 5-415L)**

(1) **Function.** To increase the combat effectiveness of division, corps, and theater Army (TA) forces by accomplishing mobility, countermobility, survivability, and general engineering tasks. The battalion constructs, repairs, and maintains main supply routes, landing strips, building structures, and utilities. When required, the battalion reinforces divisional engineer units and performs infantry combat missions.

(2) **Assignment.** To engineer brigade, corps, airborne corps, joint or combined task force.

(3) **Capabilities**

(a) Performs general engineering tasks such as construction, repair, and maintenance of landing strips, airfields, command posts, main supply routes, culverts, fords, supply installations, building structures, and other related tasks as required.

(b) Provides limited reconstruction of railroads, railroad bridges, electrical systems, and sewage and water facilities.

(c) Provides field engineering assistance and equipment support to the division engineer in preparation of major strong points and battle positions for weapons systems in support of maneuver units.

(d) Conducts engineer reconnaissance.

(e) Creates obstacles to degrade adversary mobility.

(f) Clears obstacles as part of area clearance operations (not as part of assault beaching operations).

(g) Prepares demolition targets.

(h) When required, performs infantry combat operations limited by organic weapons and equipment.

(i) Provides the capability to supervise contract construction, skilled construction labor, and unskilled indigenous personnel.

(j) Conducts area damage clearance and restoration operations.

(4) **With Attachments.** When supported by attachments of specialized personnel and equipment, the battalion provides large-scale bituminous paving operations, large-scale portland cement concrete paving operations, large-scale quarrying and crushing operations, major reconstruction of railroads and railroad bridges, major rehabilitation of ports, construction of petroleum pipelines and power distribution systems, and major airfield restoration and construction.

l. **Engineer Port Construction Company (TOE 5-603L)**

(1) **Function.** To provide specialized engineer support in developing, rehabilitating, and maintaining port facilities, including TPT and JLOTS operations.

(2) **Assignment.** Normally assigned to the engineer command for further attachment to an engineer brigade or engineer group.

(3) **Capabilities.** At full strength, this unit is capable of the following.

(a) Constructs, rehabilitates, and maintains offshore facilities, including mooring systems, jetties, breakwaters, and other structures required to provide safe anchorage for ocean-going vessels.

(b) Constructs, rehabilitates, and maintains piers, wharves, ramps, and related structures required for cargo loading and offloading. This unit constructs facilities for RO/RO, breakbulk, and containerized cargo handling.

(c) Installs and maintains tanker discharge facilities, including bulk petroleum jetties and submarine pipelines.

(d) Provides limited dredging and removal of underwater obstructions.

(e) Provides operators for two-shift operation of selected items of equipment.

(f) Constructs and maintains beach sites in support of JLOTS operations.

m. **Engineer Pipeline Construction Support Company (TOE 5-177)**

(1) **Function.** To provide technical personnel and specialized equipment to assist construction and combat engineer units in construction, rehabilitation, and maintenance (except organizational maintenance of pipeline systems). The company provides a limited independent system and assists using units in specialized repairs.

(2) **Capabilities.** Provides advisory personnel to three engineer companies engaged in pipeline construction and pipe-stringing, pipe-coupling, storage tank erection, and pump station and dispensive facility construction. Specialized tools, equipment, and operators for transporting in two lifts over unimproved roads include: 21,000 linear feet of 6-inch pipe, 16,000 linear feet

of 8-inch pipe, and 9,000 linear feet of 12-inch pipe. The unit provides, to a limited degree, construction and rehabilitation of pipeline systems, including the erection of storage tanks when construction units are not available.

n. **Control and Support Detachment (TOE 5-530LA)**

(1) **Function.** To provide TA with control of and support to all TA diving assets.

(2) **Capabilities.** Provides responsive liaison and dive-mission planning and control functions for up to six lightweight teams. The detachment provides expertise to theater commands and diving detachments or teams requiring support. The detachment provides specialized diving equipment and medical support and intermediate-level maintenance of diving life-support systems to lightweight teams.

(3) **Basis of Allocation.** Normally, one per theater in control and support of from one to six lightweight teams.

o. **Lightweight Diving Team (TOE 5-530LC)**

(1) **Function.** To provide underwater construction, light salvage, repair, and maintenance to TA missions.

(2) **Capabilities.** Perform scuba and lightweight surface-supplied diving to a depth of 190 FSW in support of light salvage, harbor clearance, underwater pipeline, fixed bridge, and port construction repair and rehabilitation. The team performs ship underwater repair and supports JLOTS operations. The team also performs underwater demolition, cutting, and welding and is capable of multiple diving operations.

(3) **Basis of Allocation.** Assigned to the control and support detachment at echelons above corps and further attached to organizations that require habitual diving support. Those organizations have been identified as the Transportation Floating Craft Maintenance Company, the Engineer Port Construction Company, and the Quartermaster Pipeline Company assigned to major submarine pipelines.

p. **Quartermaster Petroleum and Water Units**

(1) **Petroleum and Water Group.** The Petroleum and Water Group (TOE 10-602) serves as the integrating agency for the TA commander on all aspects of bulk petroleum distribution, planning, and operations. The group coordinates the efforts of the units operating the theater petroleum distribution system.

(a) The Petroleum and Water Group is responsible for the detailed petroleum distribution planning. This is the basis for design, construction, and operation of the theater distribution system. The group is responsible for liaison with host-nation staffs, including coordination of allied pipeline and distribution systems. The group and subordinate units operate

the bulk fuel distribution system extending from ports of entry through the communications zone and as far into the combat zone as practical.

(b) A Petroleum and Water Group Headquarters is assigned as a functional command to the TA headquarters. The group may also be assigned to a theater army area command (TAACOM) (or a corps support command when the TAACOM is absent). Specifically the group

1. Provides C2 for two to five petroleum pipeline and terminal operating battalions and/or transportation motor transport battalions (petroleum) and supervises other assigned and/or attached units;

2. Coordinates with the theater engineer command on construction and maintenance programs for the distribution system;

3. Implements and monitors the theater petroleum quality surveillance program;

4. Plans for receiving, storing, and distributing bulk petroleum and advises the theater commander on the capabilities and status of the distribution system;

5. Coordinates and provides bulk petroleum to the US Army, Navy, Air Force, and other supported activities based on directives received from the Theater Army Material Management Command; and

6. Implements host-nation support operational procedures as directed by the TAACOM and provides liaison to agencies involved in petroleum distribution operations within the TAACOM or Corps. The group will provide command supervision for petroleum supply battalions and/or water battalions in a contingency theater.

(2) **Petroleum Pipeline and Terminal Operating Battalion (TOE 10-206).** The petroleum pipeline and terminal operating battalion supervises the operation and maintenance of the petroleum distribution facilities required to support a portion of the theater petroleum support mission. Operating battalions are assigned to a petroleum and water group as required. The operating battalion is responsible for supervising the operation of port of entry pipelines and terminals, tactical petroleum terminals, cross-country pipelines, and other related facilities. The battalion is capable of C2 of three to five companies, operating a petroleum pipeline up to 450 miles in length. The battalion operates a central dispatching and scheduling agency to schedule and direct the flow of bulk petroleum products through the multi-product pipeline. The battalion coordinates the movement of bulk petroleum by means other than pipeline, such as barge, rail, and truck. The battalion supervises a quality surveillance program and can operate either a base or mobile petroleum laboratory, depending on the TOE variation. The battalion can also supervise other assigned or attached units used to operate and maintain the petroleum supply and distribution system.

(3) **Petroleum Pipeline and Terminal Operating Company.** On a 24-hour basis, the company can operate up to 90 miles of multi-product pipeline and terminal facilities based on terrain features. The terminal facilities normally consist of two tank farms, each with a capacity ranging from 50,000 to 250,000 barrels. When equipped with a TPT, it provides storage of 3.8 million gallons of bulk fuel in collapsible storage tanks, based upon 100 percent fill. The company can operate six pump stations along the pipeline. The company can install and operate an organic collapsible hoseline system. The company operates a TPT when permanent or semi-permanent facilities are not available, and operates loading facilities for shipment of products by coastal tanker, rail tank car, barge, and tank vehicles. Since it is responsible for all bulk fuels shipped into the theater, the company is normally assigned to a petroleum pipeline and terminal operating battalion or it may be attached to a TAACOM or an independent corps. It may also operate as a separate company under specific conditions. The company is normally employed in the rear operational area. It may begin its operation at beach heads or base terminals located near theater ports of entry or along any 90-mile section of pipeline and extend as far forward in the theater as possible. The company can also provide limited bulk reduction capabilities.

(4) **Quartermaster Water Supply Company (TOE 10-46810).** The QM water supply company is normally attached or assigned to a water supply battalion. This company can install and operate two each 10-mile tactical water distribution systems as well as store 1.6 million gallons of water in collapsible tanks. When required, the company can operate eight direct support water issue points. The company can also run a TWDS system up to 80 miles when augmented with an appropriate number of TWDS teams.

q. **Transportation Floating Craft General Support Maintenance Company (TOE 55-157).** The capability of this Army company to provide general support and maintenance are as follows.

(1) The function of the marine maintenance company is to provide maintenance support for US Army marine craft and their organic navigational equipment.

(2) The maintenance company is normally assigned to a transportation command or terminal group, although it may be attached to a transportation terminal battalion.

(3) The maintenance company can provide the following services: plumbing and pipefitting, sheetmetal working, machining, welding and blacksmithing, and repairs to instruments, marine engines, power generator equipment, radar, hulls, radios, refrigeration, rigging, and marine electrical systems.

(4) The unit receives, stores, and issues approximately 9,000 line items of marine-peculiar repair parts and items and performs marine salvage operations.

(5) The unit is authorized 195 personnel and approximately 533,600 pounds (67,000 cubic feet) of equipment requiring transportation. Additional equipment and supplies constitute approximately 71,400 pounds (2,000 cubic feet). In one lift, using organic assets, the unit can

move approximately 230 personnel and 1,692,000 pounds (136,000 cubic feet) of equipment and supplies. All equipment is transportable by air, except:

(a) 20-ton wheeled crane.

(b) 100 psi recompression chamber.

(c) Mechanized landing craft.

(d) Utility landing craft.

(6) Although shore-based repair facilities may be established if required, the bulk of the unit's work is done aboard the floating repair shop. The shop contains all the facilities necessary to support the company mission. Three repair sections, a supply platoon, and a repair control section normally function aboard the floating repair shop.

(7) The maintenance company normally operates in an established port terminal that is centrally located in relation to other terminals.

(8) The maintenance company must submit requests for repair parts directly to the theater material management center, which directs shipment from the field depot that stocks the requested items. Items repaired by the maintenance company are either returned to the using unit, supply stocks within the company, or the appropriate field theater supply activity that stocks marine items.

(9) This unit will require the continuous support of a lightweight diving team to provide adequate underwater ship's husbandry.

4. Marine Corps Units — Force Service Support Group

The FSSG is the CSS element of the MEF and as such assumes responsibility for overall CSS for the MEF. In amphibious assault operations, the FSSG provides task-organized elements to form the landing force support party. When the landing force is established ashore, the FSSG commander assumes control of, and responsibility for, CSS of the landing force. During subsequent operations ashore, elements of the FSSG may be assigned by the MAGTF commander to support or assist in LOTS operations. The transportation support battalion of the FSSG (see Figure M-11) is organized to provide C2 in a landing support company that provides direct support for landing and throughput operations at helicopter landing zones and assault beaches during the amphibious assault. Elements of the landing support companies are augmented with other elements of the FSSG through task organization to provide the initial CSS for amphibious and helicopterborne operations. The beach and terminal operations company provides general transportation support to coordinate throughput operations for the MAGTF. The headquarters and service company provides C2, administrative, and command support functions, the support company provides MHE, container handling support, and organizational maintenance support for engineer and motor transport assets of the battalion, and the general and direct support motor

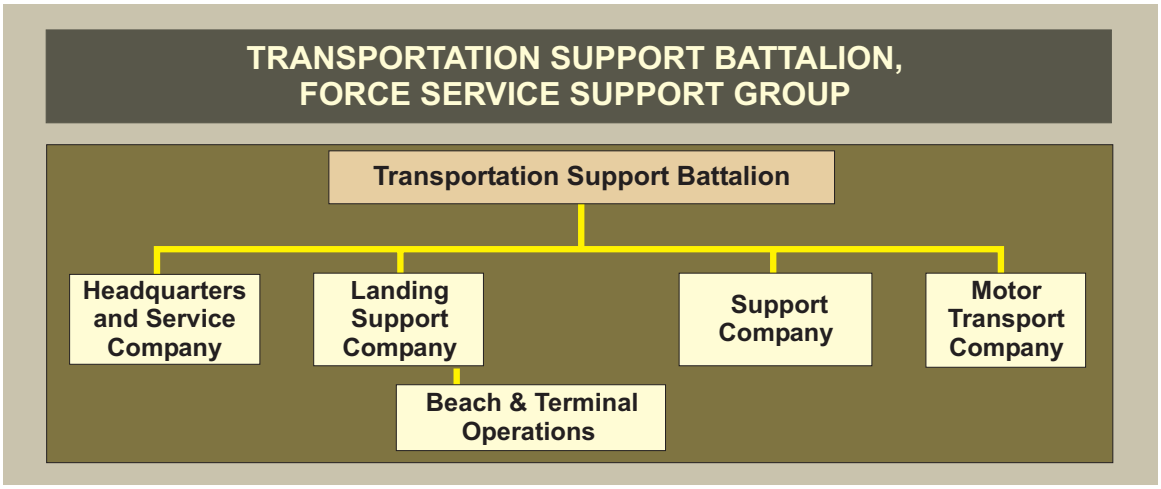


Figure M-11. Transportation Support Battalion, Force Service Support Group

transport companies provide medium and heavy lift transportation support for throughput and sustainment operations.

5. Surface Deployment and Distribution Command Single Port Manager

As one of USTRANSCOM's surface TCCs, SDDC will perform SPM functions necessary to support the strategic flow of the deploying forces' equipment and sustainment supply in the SPOE and hand-off to the geographic combatant commander in the SPOD. SDDC has port management responsibility through all phases of the theater port operations continuum, from a bare beach (i.e., JLOTS) deployment to a commercial contract fixed-port support deployment. In carrying out this responsibility, SDDC must work closely with specialized units from each of the Services. When necessary in areas where SDDC does not maintain a manned presence, a port management cell will be established to direct water terminal operations including supervising movement operations, contracts, cargo documentation, security operations, and the overall flow of information. As the SPM, SDDC is also responsible for providing strategic deployment status information to the combatant commander and to workload the SPOD port operator based on the combatant commander's priorities and guidance. The specific roles and functions of both the Port Manager and Port Operator are summarized in JP 4-01.5, *Joint Tactics, Techniques, and Procedures for Transportation Terminal Operations*.

6. Service Functions

The Services conduct several JLOTS tasks and functions of an identical nature with different units in each Service responsible for their accomplishment. Figure M-12 shows multiple tasks with the Army and Navy units responsible for those functions. Figure M-13 provides a mission summary by organization.

ARMY AND NAVY ORGANIZATIONS RESPONSIBLE FOR LOGISTICS OVER-THE-SHORE TASKS AND FUNCTIONS		
TASK/FUNCTION	ARMY	NAVY
Beach traffic control surf line to high water mark; surveys	Terminal Battalion/ HMOD	BMU
Lighterage Operations LCM LCU LCAC CSP CF LARC-V Barges, Tugs, and/or SLWT Repair and/or Maintenance LSV	 Med Boat Co Heavy Boat Co Causeway Co Causeway Co Fltng Craft Co Watercraft Team Fltng Craft General Support Maint Co Watercraft Det	 ACU ACU ACU PHIBCB PHIBCB BMU PHIBCB ACU and/or PHIBCB
Fuel Offshore-bulk (OPDS) Inland-Inland pipelines (const) Inland-Inland pipelines (oper'n) Inland Fuel Distribution Assault AABFS	Engineer Pipeline Const Co Petrol Pipeline and Term Oper'n Battalion QM Co	PHIBCB and/or UCT NMCB
Construction Causeway Pier Inst'ln RRDF Inst'ln ELCAS Inst'ln Road Inst'ln	 Causeway Co Causeway Co Eng Prt Const Co Eng Battln (Hvy)	 PHIBCB PHIBCB PHIBCB
Salvage Support Control	 Terminal Bn and/or Fltng Craft Maint Co Boat Co	 PHIBCB and/or BMU BMU
Camp Support	Internal (Co) Area Support Gp HHC Term Bn and/or Gp	PHIBCB

Figure M-12. Army and Navy Organizations Responsible for Logistics Over-the-Shore Tasks and Functions

ARMY AND NAVY ORGANIZATIONS RESPONSIBLE FOR LOGISTICS OVER-THE-SHORE TASKS AND FUNCTIONS (cont'd)		
TASK/FUNCTION	ARMY	NAVY
Communications		
Ashore (Admin)	Internal (Co)/Terminal Bn and/or Gp C&E HQ & HQ Co	NBG
Shipboard	CTC/POCD	NBG
Lighterage Cntrl	HMOD	NBG
Beach Security	MPs	PHIBCB and/or BMU
Reembarkation of NBG and/or NCNF	Terminal Bn	NBG
Cargo Offload		
Shipboard Ops (breakbulk)	CTC/POCD	NCHF unit
Shipboard Crane Ops	CTC/POCD (brkblk and/or cntnrs)	NCHF unit
Supervisors and/or	CTC/POCD	NCHF unit
Hatch Teams	CTC/POCD (brkblk and/or cntnrs)	
Stevedores	CTC/POCD	NCHF unit
Unskilled Labor	Host-Nation Suppt	Spported unit
Shoreside Cranes	CTC/POCD (containers)	NCHF unit and/or PHIBCBs
Container Offload	CTC/POCD (containers)	NCHF unit
Terminal Ops/Cntrl	Terminal Bn	Supported unit
4/6/10K RTFL	Cargo Transfer Company (Breakbulk)	Supported unit
RTCH	Cargo Transfer Company (Containers)	Supported unit
140 T Crane	Cargo Transfer Company (Containers)	
Yard Tractor	Cargo Transfer Company (Containers)	
Cargo Documentation	ACD Det	Supported unit
	Cargo Transfer Company (Breakbulk)	
Breakbulk Marshalling Yard	Cargo Transfer Company (Breakbulk)	Supported unit
Container Marshalling Yard	Cargo Transfer Company (Containers)	Supported unit
Container Stuff and/or Unstuff Yard	Cargo Transfer Company (Containers)	Supported unit

Figure M-12. Army and Navy Organizations Responsible for Logistics Over-the-Shore Tasks and Functions (cont'd)

ARMY AND NAVY ORGANIZATIONS RESPONSIBLE FOR LOGISTICS OVER-THE-SHORE TASKS AND FUNCTIONS (cont'd)		
TASK/FUNCTION	ARMY	NAVY
Water Offshore Bulk Inland	Barge Water Purification Team Water Supply Co	Amphibious Assault Bulk Water System
LOTS C2	Terminal Bn and/or Gp	NBG

AABFS	amphibious assault bulk fuel system
ACU	assault craft unit
BMU	beachmaster unit
BN	battalion
BTU	beach termination unit
C&E	communications and electronics
C2	command and control
CF	causeway ferry
CO	company
CSP	causeway section, powered
CTC	cargo transfer company
ELCAS	elevated causeway
GP	group
HHC	headquarters, headquarters company
HMOD	harbormaster operations detachment
HQ	headquarters
LARC-V	lighter, amphibious resupply cargo-5 ton
LCAC	landing craft, air cushion
LCU	landing craft, utility
LCM	landing craft, medium
LOTS	logistics over-the-shore
LSV	logistics support vessel
MP	military police
NBG	naval beach group
NCHF	Navy cargo handling force
NMCB	Naval mobile construction battalion
OPDS	offshore petroleum discharge system
PHIBCB	amphibious construction battalion
POCD	port operations cargo detachment
QM	quartermaster
RRDF	roll-on/roll-off discharge facility
RTCH	rough terrain cargo handler
RTFL	rough terrain fork lift
SLWT	side loadable warping tug
UCT	underwater construction team

Figure M-12. Army and Navy Organizations Responsible for Logistics Over-the-Shore Tasks and Functions (cont'd)

ORGANIZATION MISSION SUMMARY	
COMMAND NAVAL BEACH GROUP	ASSIGNMENT JLOTS COMMANDER
FUNCTION Provide Navy elements to support LOTS and/or JLOTS commander with master traffic control, lighterage, causeways, bulk fuel delivery, construction, landing craft, salvage, and communications to facilitate flow of cargo across beach. CAPABILITIES Direct and coordinate training and administration of NBG activities. Provide BTU, PHIBCB, and ACU components.	
COMMAND AMPHIBIOUS CONSTRUCTION BATTALION	ASSIGNMENT NBG
FUNCTION Provide elements to support operation. CAPABILITIES Install and operate causeway piers, RRDF, and ELCAS. Limited construction and camp support. Operate lighterage. Install bulk liquid systems. Salvage support. Security and beach defense. Lighterage repair.	
COMMAND BEACH TERMINATION UNIT	ASSIGNMENT NBG
FUNCTION Beach party operations to facilitate landing and moving cargo across the beach. CAPABILITIES Control of landing ships, lighterage, amphibious vehicles on beach. Determine and advise of suitability to land craft on beach. Control salvage. Assist beach security and defense.	
COMMAND ASSAULT CRAFT UNIT	ASSIGNMENT NBG
FUNCTION Provide, operate, and maintain assault craft for ship-to-shore movement. CAPABILITIES LCU, LCM, LCAC support. Maintenance and support for I-level craft repair. Administrative control of LCU, LCM, LCAC lighters.	

Figure M-13. Organization Mission Summary

ORGANIZATION MISSION SUMMARY (cont'd)	
COMMAND NAVY CARGO HANDLING FORCE	ASSIGNMENT NBG
FUNCTION Load and unload cargo carried on MPS, merchant breakbulk, and container ships; operate temporary ocean cargo terminal; load and unload cargo carried on military aircraft; operate an expeditionary air cargo terminal.	
CAPABILITIES MPS and AFOE cargo handling. Heavy lift marine crane operators. Total cargo class responsibility. Limited ocean terminal. Self support.	
COMMAND UNDERWATER CONSTRUCTION TEAM	ASSIGNMENT COMNAVCONFOR; NBG
FUNCTION Harbor, coastal, and ocean construction diving; OPDS installation support; initial LOTS site hydrographic/bathymetric/geotechnical survey reconnaissance.	
CAPABILITIES OPDS support: Underwater hydrographic/bathymetric and geotechnical surveys. Pipeline installation and stabilization. Ballast SALM; connect hoses; set product valves. Disconnect underwater pipelines. Deballast SALM. Conduct surface and subsurface BDA/BDR. Support the installation and maintenance of subsurface security devices.	
COMMAND MOBILE INSHORE UNDERSEA WARFARE UNIT	ASSIGNMENT COMNAVIUWGRU ONE/TWO; CATF; CMPF; JLOTS CDR
FUNCTION Provide seaward surveillance for interdiction of hostile surface craft and submarines.	
CAPABILITIES Radar and sonar surveillance. Establish seaward defense zones. Assist in lighterage control and lane discipline.	

Figure M-13. Organization Mission Summary (cont'd)

ORGANIZATION MISSION SUMMARY (cont'd)	
COMMAND US ARMY TRANSPORTATION COMPOSITE GROUP (TRANS GP)	ASSIGNMENT TRANSCOM
FUNCTION Command units employed in operation of water terminals and perform operations planning. CAPABILITIES Command and supervision of operations, training, and administration of transportation terminal battalions (TTBs).	
COMMAND US ARMY TRANSPORTATION TERMINAL BATTALION (TTBN)	ASSIGNMENT TRANS GP
FUNCTION Command units employed in operation of water terminals. CAPABILITIES C2, planning, and supervision over units responsible for discharging 4 ships at a terminal or 2 ships in-stream.	
COMMAND TTSCO (BB AND CONT)	ASSIGNMENT TTBN
FUNCTION Discharge, backload, and transship BB and container cargo at water terminals. CAPABILITIES Discharge and backload containers and BB. BB and container sorting, loading, stuffing, and unstuffing. Receive and process containers for retrograde. Limited in-transit storage.	
COMMAND US ARMY TRANSPORTATION MEDIUM BOAT CO.	ASSIGNMENT TTBN
FUNCTION Provide and operate landing craft for movement of personnel and cargo in water terminal operations, waterbourne tactical operations, and augment Navy craft in joint amphibious operations. CAPABILITIES Transport BB cargo, containers, and troops via landing craft.	

Figure M-13. Organization Mission Summary (cont'd)

ORGANIZATION MISSION SUMMARY (cont'd)

COMMAND	ASSIGNMENT
US ARMY TRANSPORTATION HEAVY BOAT COMPANY	TTBN

FUNCTION
Provide and operate landing craft for transportation of personnel, containers, and outsized cargo in offshore discharge operations and for augmenting lighterage service.

CAPABILITIES
Transport BB cargo, containers, personnel, and rolling stock via landing craft.

COMMAND	ASSIGNMENT
US ARMY TRANSPORTATION WATERCRAFT TEAMS	Watercraft Unit; Trans Termin Hdqtrs; TTSBN

FUNCTION
Transport cargo including bulk liquid; provide water transportation for patrol, command, inspection, and general utility services in support of terminal or inland water systems; transport deck-loaded dry cargo or bulk liquid cargo; load and discharge heavy-lift cargo beyond ship's capability; dock deep-draft oceangoing vessels, provide firefighting services, make tows of barges and vessels; intratheater line haul of cargo; provide a temporary beach site lighterage discharge facility; provide RO/RO ship interface; move rolling stock cargo and containers from ship-to-shore.

CAPABILITIES
Transport deck cargo under tow.
Transport personnel.
Transport liquid cargo.
Make crane lifts.
Transport heavy, outsized, and bulky cargo.
Make inland and coastal tows.
Assemble, maneuver, and secure floating causeway to the beach.
Install, retrieve, operate, and maintain RRDF.
Provide LOTS interface.

COMMAND	ASSIGNMENT
US ARMY TRANSPORTATION TERMINAL SERVICE TEAMS	TTSBN

FUNCTION
Cargo documentation; transportation contract supervision; personnel and equipment provision.

CAPABILITIES
Perform loading and discharge documentation.
Administer contracts for cargo load, discharge, transport and terminal clearance.
Provide personnel and equipment for cargo handling.
Operate cargo marshalling area.

Figure M-13. Organization Mission Summary (cont'd)

ORGANIZATION MISSION SUMMARY (cont'd)	
COMMAND ENGINEER COMBAT BATTALION, HEAVY	ASSIGNMENT Engr Brgd Corps, Airborne Corps, JTF and/or CTF; TAACOM
FUNCTION Construct, repair, and maintain main supply routes, landing strips, building structures, and utilities; reinforce divisional engineer units and infantry combat missions. CAPABILITIES General engineering tasks. Limited reconstruction of RRs, RR bridges, electrical systems, sewage and water facilities. Field engineering assistance and equipment support. Engineer reconnaissance. Create and clear obstacles. Prepare demolition targets. Perform combat infantry operations. Supervise contract construction, skilled and unskilled labor. Damage clearance and restoration operations.	
COMMAND ENGINEER PORT CONSTRUCTION COMPANY	ASSIGNMENT TTG, TAACOM, and/or JLOTS
FUNCTION Provide specialized engineer support in developing, rehabilitation, and maintaining port facilities. CAPABILITIES Construct, rehabilitate, and maintain offshore facilities. Construct, rehabilitate, and maintain piers, wharves, ramps and cargo load and unload structures. Install and maintain tanker discharge facilities. Limited dredging and obstacle removal. Equipment operation.	
COMMAND ENGINEER PIPELINE CONSTRUCTION SUPPORT COMPANY	ASSIGNMENT Engineer Command
FUNCTION Provide technical personnel and equipment to assist construction and combat engineering units in construction, rehabilitation, and maintenance. CAPABILITIES Provide advisory personnel to engineer companies engaged in: Pipeline construction. Pipe stringing. Pipe coupling. Storage tank erection. Pump station and dispensive facility construction.	

Figure M-13. Organization Mission Summary (cont'd)

ORGANIZATION MISSION SUMMARY (cont'd)	
COMMAND ENGINEER HEAVY DIVING TEAM	ASSIGNMENT TAACOM; TRANS GP, JLOTS CDR
FUNCTION Provide diving asset control and support. CAPABILITIES Liaison and dive mission planning and control. Diving expertise support. Specialized diving equipment and medical support. I-level maintenance of diving support systems.	
COMMAND ENGINEER LIGHTWEIGHT DIVING TEAM	ASSIGNMENT TAACOM; TRANS GP, JLOTS CDR
FUNCTION Underwater construction, light salvage, repair, and maintenance to diving systems. CAPABILITIES Scuba and lightweight surface diving for: Light salvage. Harbor clearance. Underwater pipeline. Fixed bridge. Port construction, repair, and maintenance. Ship underwater repair.	
COMMAND US ARMY TRANSPORTATION CARGO TRANSFER COMPANY	ASSIGNMENT TTBN
FUNCTION Discharge, backload, and transship breakbulk, container and RO-RO cargo at water terminals and LOTS sites. CAPABILITIES Operate up to four rail, truck or air terminals; Discharge or load 350 vehicles from/to RO/RO ship during LOTS. Discharge 1,000 vehicles or load 750 vehicles from/to a RO/RO ship at fixed port. Provide cargo documentation and redocument diverted or reconsigned cargo. Provide crane operators and stevedores to augment Port Operations Cargo Detachment.	

Figure M-13. Organization Mission Summary (cont'd)

ORGANIZATION MISSION SUMMARY (cont'd)	
COMMAND US ARMY PORT OPERATIONS CARGO DETACHMENT	ASSIGNMENT TTBN
FUNCTION Discharge, backload, and transship breakbulk and container cargo at water terminals and LOTS sites. CAPABILITIES Discharge and backload 1,500 short tons of breakbulk cargo during LOTS; Discharge or load 300 containers during LOTS. Discharge or load 2,500 short tons of breakbulk cargo at fixed port. Discharge or load 500 containers at fixed port.	
COMMAND US ARMY TRANSPORTATION HARBORMASTER OPERATIONS DETACHMENT	ASSIGNMENT TTBN
FUNCTION Provide operational control for vessels, harborcraft operations, and related functions. CAPABILITIES Provide short and long range communications. Simultaneously operate an LCC, two-SLCPs and two BLCPs. Perform fixed port harbormaster functions.	
COMMAND QUARTERMASTER PETROLEUM AND WATER UNITS	ASSIGNMENT TAACOM and/or TTG
FUNCTION Bulk petroleum planning and operations; water supply and distribution. CAPABILITIES C2 for petroleum units. Distribution system maintenance. Petroleum quality surveillance program. Petroleum receipt, storage, and distribution planning. Coordinates and provides petroleum to all Services. Implements host-nation support procedures. Nonpipeline fuel distribution. Bulk potable water production and distribution.	

Figure M-13. Organization Mission Summary (cont'd)

ORGANIZATION MISSION SUMMARY (cont'd)	
COMMAND TRANSPORTATION FLOATING CRAFT GENERAL SUPPORT MAINT Co	ASSIGNMENT TTG
FUNCTION Maintenance support for Army marine craft and navigational equipment. CAPABILITIES Marine craft maintenance and repair. Receipt, storage, and issuance of repair parts.	
COMMAND FSSG (Marine Corps)	ASSIGNMENT MAGTF CDR
FUNCTION Responsible for providing overall combat service support to the landing force (MEF-level MAGTF). CAPABILITIES Full spectrum of logistic support beyond MAGTF unit's organic capabilities. Management and operation of ports, railheads, airheads, and other cargo terminals. During an amphibious assault operation, provides organized elements to form the landing force support party.	
COMMAND PORT SECURITY UNIT (USCG)	ASSIGNMENT JLOTS CDR
FUNCTION Ensure security for sensitive port areas and ensure safe movement of explosives, POL, and other dangerous cargoes between vessel and dock. CAPABILITIES Establish and enforce waterfront exclusionary areas. Advisory and inspection functions on transfer of dangerous cargoes. Surveillance of sensitive waterfront areas.	

Figure M-13. Organization Mission Summary (cont'd)

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APPENDIX N
LIGHTERAGE SALVAGE OPERATIONS

1. Overview

A certain amount of casualties among supporting lighterage and other discharge support assets is inevitable while conducting JLOTS operations. Lighterage salvage is the salvage, emergency repair, and clearing of damaged, inoperative, broached, or stranded lighterage, including discharge facilities and other offload support craft and equipment. The primary objective of salvage operations is to assist, as appropriate, in maintaining the continuous flow of cargo ashore. In accomplishing this objective, salvage includes keeping the beach and sea approaches clear, assisting discharge facilities and supplementary equipment when required, and moving or assisting incapacitated lighterage to designated repair sites.

2. Salvage Tasks

a. The salvage of lighterage used in the ship-to-shore movement of cargo is accomplished by one or a combination of three distinct salvage elements.

(1) Afloat heavy salvage for surf zone operations.

(2) Beach salvage for surf zone and dry beach operations.

(3) Afloat light salvage for offshore, non-surf zone operations.

b. Salvage is not normally conducted using definite rules and procedures. Rather, salvage operations must be adaptable to variable and unpredictable circumstances (e.g., weather; sea state; tempo of operations; and bottom, surf, and beach characteristics). The primary tasks of the salvage organization are as follows.

(1) Assist broached lighterage in retracting from the beach.

(2) Assist floating causeway facilities and other discharge facilities when required.

(3) Move hull-damaged lighterage to the high water mark.

(4) Effect simple repairs, such as clearing fouled propellers.

(5) Clear heavy obstacles.

(6) Deadman landing craft or floating ferries.

(7) Help raise inoperative boat ramps.

(8) Assist vehicles that have become inoperative in the water or beach areas.

c. When a loaded craft grounds offshore, any practical system that will expedite unloading cargo from the craft will be used. Amphibians may be able to moor alongside or at the lowered ramp to permit transferring small items of cargo by hand. Cargo too heavy to be moved by hand will be lifted by RT crane. The crane is driven to the stranded craft if intervening depths and surf conditions permit.

d. The primary aim of beach and surf salvage operations is to keep the working beach clear. Craft that can be repaired or removed quickly are given priority, and craft that cannot be salvaged readily are anchored securely and left at the beach until traffic eases and more time can be devoted to them.

3. Organization

The Navy will provide personnel and equipment to meet beach, surf zone, and offshore salvage requirements. The OCO is designated as the senior salvage officer and is responsible for overall salvage operations. However, this responsibility is normally delegated to the beach party element in cases involving lighterage in the surf zones and to the assistant salvage officer as designated by the JLOTS commander in cases seaward of the surf zone. This organization is depicted in Figure N-1. The OCO will be advised of all lighterage casualties, estimated repair times (if known), or repair services required. The OCO and the lighterage repair officer will coordinate the location of post-salvage repair facilities.

4. Equipment

a. **Beach Salvage Party.** The beach salvage party is stationed ashore and is equipped with one bulldozer rigged with a fendered blade and a rear winch; two LARC-Vs, each equipped with a reinforced pusher plow; and a de-watering and firefighting pump, cargo truck, and light trailer.

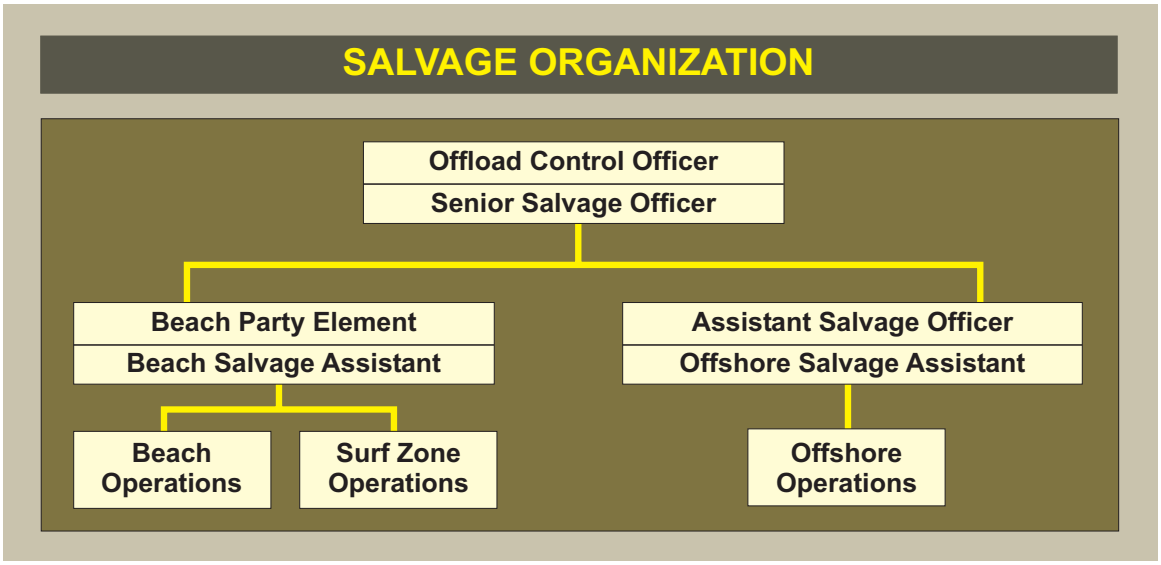


Figure N-1. Salvage Organization

(1) **Free Salvage Bulldozer.** This bulldozer is fitted with a fendered blade and has a single driving winch capable of 120,000-lb line pull using 150 feet of 1 1/4-inch wire. It is used to:

(a) Winch disabled craft out of the water.

(b) Deadman causeways when they first arrive at the beach.

(c) Deadman landing craft.

(d) Snake stalled vehicles out of the water.

(e) Perform earth moving tasks.

(f) In emergencies, push grounded landing craft off the beach. The bulldozers can also be used for limited beach improvement or construction of beach exits.

(2) **Cargo Truck.** This vehicle provides means for the salvage detachment to tow trailers and stow personnel support equipment, repair parts, and mechanic tools for the salvage team.

(3) **Light Trailer.** This trailer provides the salvage team with its own lighting capability for working at night, if necessary.

b. **Surf Salvage Boat.** The heavy salvage boat is normally an LCM-8 that has been converted to meet specific salvage requirements. The boat is stationed outside the surf zone but close enough to maintain good visibility of the beach and its approaches. Warping tugs may be used in heavy salvage operations in place of LCM-8s. Army watercraft units normally use sister vessels for salvage operations.

c. **Light Salvage Boat.** A light salvage boat can be a landing craft or warping tug and is stationed seaward of the surf zone in proximity to lighterage routing lanes. Normally, the light salvage boat assists in towing and carries de-watering and firefighting equipment.

d. **Bulldozer.** A bulldozer will be used to push stranded craft back into the water. The blade of the bulldozer will be padded by fenders, salvaged tires, or similar material to prevent damage to the hulls or ramps of the craft. Where possible, one bulldozer will be readily available to each operational beach to provide maximum salvage capability.

e. **Lighter, Amphibious Resupply Cargo V.** The primary mission of the Navy's LARC-V is surf and salvage. The LARC-V's ability to transport men and cargo is very limited and is only recommended as a last resort.

5. Craft Manning

No craft is ever left on the beach unattended or unwatched. The operator will remain constantly at the controls within the constraints of safety.

6. Salvage Operations

Salvage personnel and equipment will be stationed as directed by the OCO or the designated salvage assistant in the beach party element. Salvage operations will be initiated by signal flags or radio. The salvage element will then proceed to the appropriate lighterage and conduct operations in accordance with good practice and procedures and the rules of good seamanship. For joint operations, salvage procedures should be reviewed by both Navy and Army personnel to ensure compatibility and consistency of operations. The Navy's "Joint Surf Manual" (COMNAVSURFLANT/PACINST 3840.1B) is an excellent guide for surf and salvage operations.

APPENDIX O
REFERENCES

The development of JP 4-01.6 is based upon the following primary references:

1. DOD Directives and Regulations

a. DOD 4140.25-M Volumes I-IV, *DOD Management of Bulk Petroleum Products, Natural Gas, and Coal*.

b. DOD 4500.9-R, *Defense Transportation Regulation, Part II, Cargo Movement*.

c. DOD 4500.9-R, *Defense Transportation Regulation, Part VI, Management and Control of Intermodal Containers and System 463-L Equipment*.

d. Department of Defense Directive (DODD) 4140.25, *DOD Management Policy for Energy Commodities and Related Services*.

e. DODD 5100.1, *Functions of the Department of Defense and Its Major Components*.

f. DODD 5100.3, *Support of the Headquarters of Combatant and Subordinate Joint Commands*.

2. Joint Publications

a. JP 0-2, *Unified Action Armed Forces (UNAAF)*.

b. JP 1-02, *DOD Dictionary of Military and Associated Terms*.

c. JP 3-0, *Doctrine for Joint Operations*.

d. JP 3-02, *Joint Doctrine for Amphibious Operations*.

e. JP 3-02.1, *Joint Doctrine for Landing Force Operations*, (Test Publication).

f. JP 3-02.2, *Joint Doctrine for Amphibious Embarkation*.

g. JP 3-10, *Doctrine for Joint Rear Area Operations*.

h. JP 3-10.1, *Joint Tactics, Techniques, and Procedures for Base Defense*.

i. JP 3-11, *Joint Doctrine for Operations in Nuclear, Biological, and Chemical (NBC) Environments*.

j. JP 3-34, *Engineer Doctrine for Joint Operations*.

k. JP 3-35, *Joint Deployment and Redeployment Operations*.

l. JP 4-0, *Doctrine for Logistic Support of Joint Operations*.

m. JP 4-01.2, *Joint Tactics, Techniques, and Procedures for Sealift Support to Joint Operations*.

n. JP 4-01.3, *Joint Tactics, Techniques, and Procedures for Movement Control*.

o. JP 4-01.5, *Joint Tactics, Techniques, and Procedures for Transportation Terminal Operations*.

p. JP 4-01.7, *Joint Tactics, Techniques, and Procedures for Use of Intermodal Containers in Joint Operations*.

q. JP 4-01.8, *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration*.

r. JP 4-03, *Joint Bulk Petroleum and Water Doctrine*.

s. JP 4-04, *Joint Doctrine for Civil Engineering Support*.

t. JP 5-00.2, *Joint Task Force Planning Guidance and Procedures*.

u. Chairman of the Joint Chiefs of Staff Manual 3122.03, *Joint Operation Planning and Execution System Vol II: (Planning Formats and Guidance), Appendix 5 to Annex D, Mobility and Transportation*.

3. Allied Publications

a. Allied Tactical Publication (ATP)-2, *Allied Naval Control of Shipping Manual*.

b. ATP-8, *Doctrine for Amphibious Operations*.

4. Army Regulations

a. Army Regulation (AR) 56-4, *Management of Army Intermodal Container Systems*.

b. AR 115-10, (AFJI 15-157), *Weather Support for the US Army*.

c. AR 220-10, *Preparation for Oversea Movement of Units (POM)*.

5. Army Publications

a. FM 3-0, *Operations*.

b. FM 3-01.8, *Combined Arms for Air Defense*.

c. FM 3-34, *Engineer Operations*.

d. FM 3-34.250, *General Engineering*.

e. FM 3-50, *Decisive Force: The Army in Theater Operations*.

f. FM 4-0, *Combat Service Support*.

g. FM 4-01, *Transportation Operations*.

h. FM 4-01.011, *Strategic Lift*.

i. FM 4-01.50, *Army Water Transportation Operations*.

j. FM 4-01.60, *Transportation Intermodel Units and Operations*.

k. FM 4-01.7, *Army Container Operations*.

l. FM 4-03, *Petroleum Supply in Theater of Operations*.

m. FM 4-20.21, *Water Supply in Theater of Operations*.

n. FM 100-17-1, *Army Pre-Positioned Afloat Operations*.

o. FM TBD, *Transportation Reference Data*.

p. FM TBD, *Cargo Specialist Handbook*.

q. FM TBD, *Army Terminal Operations*.

r. FM TBD, *Marine Crewman's Handbook*.

s. FM TBD, *Landing Craft Operator's Handbook*.

6. Naval Warfare Publications

a. NWP 1-01, *Naval Warfare Publications System*.

b. NWP 1-02, *Naval Supplement to the DOD Dictionary of Military and Associated Terms*.

c. NWP 3-02.1, *Ship-to-Shore Movement*.

d. NTTP 3-02.3M, *Maritime Prepositioning Force Operations*.

e. NWP 3-02.12, *Employment of Landing Craft Air Cushion (LCAC)*.

f. NWP 3-02.14, *The Naval Beach Group*.

g. NWP 3-02.21, *MSC Support of Amphibious Operations*.

h. NWP 3-07.12, *Naval Control and Protection of Shipping*.

i. NWP 3-10, *Naval Coastal Warfare*.

j. NWP 4-01, *Naval Transportation*.

k. NWP 4-01.1, *Navy Expeditionary Shore-Based Logistic Support and Reception, Staging, Onward Movement, and Integration Operations*.

l. NDP 6, *Naval Command and Control*.

7. Navy Directives

a. Secretary of the Navy Instructions (SECNAVINST)

(1) SECNAVINST 4620.8 series, *Single Manager for Ocean Transportation Accessorial and Other Miscellaneous Services Related to Dry Reefer Cargo; Responsibilities for*.

(2) SECNAVINST 5430.11 series, *Military Sealift Command; Prescribing Channels of Responsibility for*.

b. Chief of Naval Operations Instructions (OPNAVINST)

(1) OPNAVINST 4620.4 series, *Navy Policy Regarding Fleet Operating Forces and Military Sealift Command Forces, and Other Related Matters*.

(2) OPNAVINST 4620.6 series, *Logistics Over-the-Shore Operations in Overseas Areas*.

(3) OPNAVINST 5440.73 series, *US Navy Cargo Handling and Port Group; Mission, Capabilities, and Emergency Augmentation of*.

(4) OPNAVINST 5720.2 series, *Embarkation in US Naval Ships*.

c. MSC Directives

(1) COMSCINST 2011.1 series, *Contingency Communications with the US Flag Merchant Fleet*.

(2) COMSCINST 3090.1 series, *MSC Command, Control and Communications (C3)*.

(3) COMSCINST 3120.19 series, *Administrative Procedures for Embarkation, Carriage, and Debarkation of Supercargo Personnel in MSC Ships*.

(4) COMSCINST 3121.1 series, *Operational Control Procedures for MSC-Controlled Ships (less tankers)*.

(5) COMSCINST 4622.9 series, *Policy and Conditions Governing MSC Use of Foreign Flag Ships*.

(6) COMSCINST 5030.1 series, *MSC Abbreviated Titles and Symbols*.

(7) COMSCINST 5100.17 series, *MSC Safety Manual*.

(8) COMSCINST 5440.1 series, *MSC Command Organization*.

(9) COMSCINST 5440.2 series, *Boundaries of MSC Area and Subarea Commands*.

(10) COMSCINST 5440.8 series, *Organization of Commander, Military Sealift Command Headquarters*.

d. COMNAVSURFLANT/COMNAVSURFPAC Instructions

(1) 3840.1 series, *Joint Surf Manual*.

(2) NCOP 3-59.3, *Surf Zone Operations*.

8. Marine Corps Orders

Marine Corps Orders 4620.6 series, *Transportation and Travel: Logistics Over-the-Shore Operations in Overseas Areas*.

9. Marine Corps Publications

a. Marine Corps Reference Publication 4-11.3, *Transportation Operations*.

b. MCWP 3-11.4, *Tactical Fundamentals of Helicopterborne Operations*.

c. MCWP 3-32, *Maritime Prepositioning Force (MPF) Operations*.

d. MCWP 3-40.1, *MAGTF Command and Control*.

e. MCWP 4-1, *Logistics Operations*.

f. MCWP 4-11, *Tactical-Level Logistics*.

g. MCWP 4-11.1, *Health Service Support Operations*.

h. MCWP 5-1, *Marine Corps Planning Process and Procedures*.

i. MCWP 6-2, *MAGTF Command and Control*.

10. Air Force Instructions

a. Air Force Instruction 15-128, *Aerospace Weather Operations*.

b. Air Force Joint Instruction (AFJI) 15-157, *Weather Support for the US Army.*

c. AFJI 24-102, *Logistics Over-the-Shore Operations in Oversea Areas*.

11. Coast Guard Publications

Commandant Instruction M16000.12, *Marine Safety Manual, Volume 7, Port Security*.

12. Code of Federal Regulation

46 Code of Federal Regulation, part 146, Rules and Regulations for Military Explosives and Hazardous Munitions.

13. Memorandum of Agreement

a. Memorandum of Agreement on US Navy and US Army Joint Strategic Mobility Program Development and Coordination, 8 December 1986.

b. Joint Army and Navy Memorandum of Agreement between Vice Chief of Staff, Army and Vice Chief of Naval Operations, Navy, Development of Joint Logistics Over-the-Shore (JLOTS) Systems, August 1996.

14. Miscellaneous

a. Chairman of the Joint Chiefs of Staff Instruction 5120.02, *Joint Doctrine Development System*.

b. Army and Navy JLOTS Master Plan, December 1997.

c. NAVFACENGCOM Pub 460, September 1981, *Elevated Causeway Facility Installation and Retrieval.*

d. Naval Civil Engineering Laboratory Technical Note N1796, July 1989, *Lateral Stability of Flexible Submarine Hoseline*.

e. NAVFACENGCOM, January 1982, *Initial Definition Amphibious Logistic System (ALS)*.

f. NAVFACENGCOM TM9CE023.02 and Army TM55194520114, *Installation/Retrieval and Operation/Maintenance Instructions for the RO/RO Discharge Facility*.

g. NAVSEA, PMS 377 various, December 1984, T*ACS Class Mission Operations Handbooks*.

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APPENDIX P
ADMINISTRATIVE INSTRUCTIONS

1. User Comments

Users in the field are highly encouraged to submit comments on this publication to: Commander, United States Joint Forces Command, Joint Warfighting Center, ATTN: Doctrine and Education Group, 116 Lake View Parkway, Suffolk, VA 23435-2697. These comments should address content (accuracy, usefulness, consistency, and organization), writing, and appearance.

2. Authorship

The lead agent for this publication is the United States Transportation Command. The Joint Staff doctrine sponsor for this publication is the Director for Logistics (J-4).

3. Supersession

This publication supersedes JP 4-01.6, 12 November 1998, *Joint Tactics, Techniques, and Procedures for Joint Logistics Over-the-Shore (JLOTS)*.

4. Change Recommendations

a. Recommendations for urgent changes to this publication should be submitted:

TO: JOINT STAFF WASHINGTON DC//J7//JEDD//
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INFO: CDRUSJFCOM SUFFOLK VA//DOC GP//
AIG 7026

Routine changes should be submitted electronically to Commander, Joint Warfighting Center, Doctrine and Education Group and info the Lead Agent and the Director for Operational Plans and Joint Force Development J-7/JEDD via the CJCS JEL at http://www.dtic.mi./doctrine.

b. When a Joint Staff directorate submits a proposal to the Chairman of the Joint Chiefs of Staff that would change source document information reflected in this publication, that directorate will include a proposed change to this publication as an enclosure to its proposal. The Military Services and other organizations are requested to notify the Joint Staff/J-7, when changes to source documents reflected in this publication are initiated.

c. Record of Changes:

CHANGE NUMBER	COPY NUMBER	DATE OF CHANGE	DATE ENTERED	POSTED BY	REMARKS

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GLOSSARY
PART I — ABBREVIATIONS AND ACRONYMS

AACG	arrival airfield control group
AAFS	amphibious assault fuel system
AAOG	arrival and assembly operations group
ABFC	advanced base functional component
ABLTS	amphibious bulk liquid transfer system
ACB	amphibious construction battalion
ACU	assault craft unit
ACV	air cushion vehicle
ADP	automated data processing
ADS	amphibian discharge site
AE	assault echelon
AF	amphibious force
AFJI	Air Force joint instruction
AFOE	assault follow on echelon
AFW	Air Force weather
AMC	Air Mobility Command
AOA	amphibious objective area
AOR	area of responsibility
APF	afloat pre-positioning force
APS	afloat pre-positioning ships
AR	Army regulation
ASCC	Army Service component commander
ATF	amphibious task force
ATP	Allied tactical publication
BCU	beach clearance unit
BLCP	beach lighterage control point
BMU	beachmaster unit
BTU	beach termination unit
C2	command and control
CAA	command arrangement agreement
CATF	commander, amphibious task force
CBRNE	chemical, biological, radiological, nuclear and high-yield explosives
CDRUSTRANSCOM	Commander, United States Transportation Command
CESE	civil engineering support equipment
CF	causeway ferry
CHB	cargo handling battalion (Navy)
CJCS	Chairman of the Joint Chiefs of Staff
CLF	commander, landing force
CMPF	commander, maritime pre-positioned force

COCOM	combatant command (command authority)
COMSAT	communications satellite
COMSC	Commander, Military Sealift Command
COMSCINST	Commander Military Sealift Command instruction
COTS	container offloading and transfer system
CPX	command post exercise
CSNP	causeway section, nonpowered
CSNP(BE)	causeway section, nonpowered (beach end)
CSNP(I)	causeway section, nonpowered (intermediate)
CSNP(SE)	causeway section, nonpowered (sea end)
CSP	causeway section, powered
CSS	combat service support
CTC	cargo transfer company
CW	continuous wave
CWP	causeway pier
DOD	Department of Defense
DODD	Department of Defense directive
DTS	Defense Transportation System
DWMCF	double-wide modular causeway ferry
ELCAS	elevated causeway system
ELCAS (M)	elevated causeway system (modular)
EST	embarked security team
FC	floating causeway
FLO/FLO	float on/floatoff
FM	field manual
FP	force protection
FSSG	force service support group (USMC)
FSW	feet of seawater
GPM	gallons per minute
HDCU	harbor defense command unit
HMMWV	high mobility multipurpose wheeled vehicle
HMOD	habormaster operations detachment
IBU	inshore boat unit
ICODES	integrated computerized deployment system
IDZ	inner defense zone
IPDS	inland petroleum distribution system
ISO	International Organization for Standardization
ISOPAK	International Organization for Standardization Package

JFC	joint force commander
JLCC	joint lighterage control center
JLOTS	joint logistics over-the-shore
JMAT	joint mobility assistance team
JP	joint publication
LARC-V	lighter, amphibious resupply, cargo, 5 ton
LASH	lighter aboard ship
LCAC	landing craft, air cushion
LCC	lighterage control center
LCM	landing craft, mechanized
LCO	lighterage control officer
LCP	lighterage control point
LCU	landing craft, utility
LF	landing force
LFSP	landing force support party
LNO	liaison officer
LOA	logistics over-the-shore operation area
LOGAIS	logistics automated information system
LOTS	logistics over-the-shore
LST	landing ship, tank
LSV	logistics support vessel
LT	long ton
MAGTF	Marine air-ground task force
MARAD	Maritime Administration
MAST	mobile ashore support terminal
MCS	modular causeway system
MCWP	Marine Corps warfighting publication
MDSS II	MAGTF Deployment System II
MEB	Marine expeditionary brigade
MEF	Marine expeditionary force
MET	mobile environmental team
METOC	meteorological and oceanographic
MHE	materials handling equipment
MIUW	mobile inshore undersea warfare
MIUWU	mobile inshore undersea warfare unit
MLW	mean low water
MOA	memorandum of agreement
MPF	maritime pre-positioning force
MPS	maritime pre-positioning ships
MPSRON	maritime pre-positioning ships squadron
MSC	Military Sealift Command
MSCO	Military Sealift Command Office
MSI	modified surface index

MSP	mobile sensor platform
MT	measurement ton
MT/D	measurement tons per day
NAVCHAPGRU	Navy cargo handling and port group
NAVFACENGCOM	Navy Facilities Engineering Command
NAVSAT	navigation satellite
NAVSEA	Naval Sea Systems Command
NBC	nuclear, biological, and chemical
NBG	naval beach group
NCHF	Navy cargo handling force
NL	Navy lighterage
NSE	Navy support element
NSSCS	non-self-sustaining containership
NTTP	naval tactics, techniques, and procedures
NWP	naval warfare publication
OBFS	offshore bulk fuel system
OCO	offload control officer
ODZ	outer defense zone
OIC	officer in charge
OPCON	operational control
OPDS	offshore petroleum discharge system
OPLAN	operation plan
OPNAVINST	Chief of Naval Operations instruction
OPORD	operation order
OPP	offload preparation party
OTC	officer in tactical command
OUB	offshore petroleum discharge system (OPDS) utility boat
PBCR	portable bar code recorder
PHIBCB	amphibious construction battalion
POCD	port operations cargo detachment
PSA	port support activity
psi	pounds per square inch
PSP	portable sensor platform
PSU	port security unit
QM	quartermaster
RFID	radio frequency identification
RO/RO	roll-on/roll-off
ROWPU	reverse osmosis water purification unit
RRDF	roll-on/roll-off discharge facility
RRF	Ready Reserve Force

RT	rough terrain
RTCC	rough terrain container crane
RTCH	rough terrain container handler
SALM	single anchor leg mooring
SDDC	Surface Deployment and Distribution Command
SDO	ship's debarkation officer
SEABEE	sea barge
SecDef	Secretary of Defense
SECNAVINST	Secretary of the Navy instruction
SLCP	ship lighterage control point
SLWT	side loadable warping tug
SPM	single port manager
SPOD	seaport of debarkation
SPOE	seaport of embarkation
ST	short ton
SUROBS	surf observation
TA	theater Army
TAACOM	theater Army area command
TACON	tactical control
T-ACS	auxiliary crane ship
TC-AIMS	Transportation Coordinator's Automated Information for Movement System
TCC	transportation component command
TCMD	transportation control and movement document
TEU	twenty-foot equivalent unit
TM	technical manual
TOA	table of allowance
TOE	table of organization and equipment
TPT	tactical petroleum terminal
TWDS	Tactical Water Distribution System
UCT	underwater construction team
USTRANSCOM	United States Transportation Command
VHF	very high frequency
WPA	water jet propulsion assembly
WPS	Worldwide Port System

afloat pre-positioning force. Shipping maintained in full operational status to afloat pre-position military equipment and supplies in support of combatant commanders' operation plans. The afloat pre-positioning force consists of the three maritime pre-positioning ships squadrons and the afloat pre-positioning ships. Also called APF. (JP 1-02)

afloat pre-positioning operations. Pre-positioning of ships, preloaded with equipment and supplies (including ammunition and petroleum) that provides for an alternative to land-based programs. This concept provides for ships and onboard force support equipment and supplies positioned near potential crisis areas that can be delivered rapidly to joint airlifted forces in the operational area. Afloat pre-positioning in forward areas enhances a force's capability to respond to a crisis resulting in faster reaction time. (JP 1-02)

afloat pre-positioning ships. Forward deployed merchant ships loaded with tactical equipment and supplies to support the initial deployment of military forces. Also called APS. (JP 1-02)

amphibian. A small craft, propelled by propellers and wheels or by air cushions for the purpose of moving on both land and water. (JP 1-02)

amphibious bulk liquid transfer system. Hosereel system providing capability to deliver fuel and/or water from ship to shore. System includes 10,000 feet of 6" buoyant hose for fuel, and 10,000 ft of 4" buoyant hose for water. Systems are deployed on Maritime Pre-positioning Squadrons, and are normally used in direct support of maritime pre-positioning force operations. Also called ABLTS. (This term and its definition modify the existing term "amphibious assault bulk fuel system" and its definition and are approved for inclusion in the next edition of JP 1-02.)

amphibious construction battalion. A permanently commissioned naval unit, subordinate to the Commander, Naval Beach Group, designed to provide an administrative unit from which personnel and equipment are formed in tactical elements and made available to appropriate commanders to operate pontoon causeways, transfer barges, warping tugs, and assault bulk fuel systems, and to meet salvage requirements of the naval beach party. Also called PHIBCB. (JP 1-02)

amphibious objective area. A geographical area (delineated for command and control purposes in the order initiating the amphibious operation) within which is located the objective(s) to be secured by the amphibious force. This area must be of sufficient size to ensure accomplishment of the amphibious task force's mission and must provide sufficient area for conducting necessary sea, air, and land operations. Also called AOA. (JP 1-02)

amphibious operation. A military operation launched from the sea by an amphibious force, embarked in ships or craft with the primary purpose of introducing a landing force ashore to accomplish the assigned mission. (JP 1-02)

amphibious task force. A Navy task organization formed to conduct amphibious operations. The amphibious task force, together with the landing force and other forces, constitutes the amphibious force. Also called ATF. (JP 1-02)

anchorage. A specified location for anchoring or mooring a vessel in-stream or offshore. (JP 1-02)

assault craft unit. A permanently commissioned naval organization, subordinate to the commander, naval beach group, that contains landing craft and crews necessary to provide lighterage required in an amphibious operation. Also called ACU. (JP 1-02)

assault echelon. In amphibious operations, the element of a force comprised of tailored units and aircraft assigned to conduct the initial assault on the operational area. Also called AE. (JP 1-02)

assault follow-on echelon. In amphibious operations, that echelon of the assault troops, vehicles, aircraft equipment, and supplies that, though not needed to initiate the assault, is required to support and sustain the assault. In order to accomplish its purpose, it is normally required in the objective area no later than five days after commencement of the assault landing. Also called AFOE (JP 1-02)

backshore. The area of a beach extending from the limit of high water foam lines to dunes or extreme inland limit of the beach. (JP 1-02)

backwash. An even layer of water that moves along the sea floor from the beach through the surf zone and caused by the pileup of water on the beach from incoming breakers. (JP 1-02)

bar. A submerged or emerged embankment of sand, gravel, or mud created on the sea floor in shallow water by waves and currents. A bar may be composed of mollusk shells. (JP 1-02)

barge. A flat-bed shallow-draft vessel with no superstructure that is used for the transport of cargo and ships' stores or for general utility purposes. (JP 1-02)

beachmaster unit. A commissioned naval unit of the naval beach group designed to provide to the shore party a Navy component known as a beach party, which is capable of supporting the amphibious landing of one division (reinforced). Also called BMU. (JP 1-02)

berm, natural. The nearly horizontal portion of a beach or backshore having an abrupt fall and formed by deposition of material by wave action. A berm marks the limit of ordinary high tide. For air cushion vehicles, berms (constructed) are required to protect materials handling equipment operations. (JP 1-02)

bight. A bend in a coast forming an open bay or an open bay formed by such a bend. (JP 1-02)

breaker. A wave in the process of losing energy where offshore energy loss is caused by wind action and nearshore energy loss is caused by the impact of the sea floor as the wave enters shallow (shoaling) water. Breakers either plunge, spill, or surge. (JP 1-02)

breaker angle. The angle a breaker makes with the beach. (JP 1-02)

broach. When a water craft is thrown broadside to the wind and waves, against a bar, or against the shoreline. (JP 1-02)

bulk cargo. That which is generally shipped in volume where the transportation conveyance is the only external container; such as liquids, ore, or grain. (JP 1-02)

cantilever lifting frame. Used to move Navy lighterage causeway systems on to and off of lighter aboard ship (LASH) vessels. This device is suspended from the Morgan LASH barge crane and can lift one causeway section at a time. It is designed to allow the long sections to clear the rear of the ship as they are lowered into the water. Also called CLF. (JP 1-02)

causeway. A craft similar in design to a barge, but longer and narrower, designed to assist in the discharge and transport of cargo from vessels. (JP 1-02)

combatant command (command authority). Nontransferable command authority established by title 10 ("Armed Forces"), United States Code, section 164, exercised only by commanders of unified or specified combatant commands unless otherwise directed by the President or the Secretary of Defense. Combatant command (command authority) cannot be delegated and is the authority of a combatant commander to perform those functions of command over assigned forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction over all aspects of military operations, joint training, and logistics necessary to accomplish the missions assigned to the command. Combatant command (command authority) should be exercised through the commanders of subordinate organizations. Normally this authority is exercised through subordinate joint force commanders and Service and/or functional component commanders. Combatant command (command authority) provides full authority to organize and employ commands and forces as the combatant commander considers necessary to accomplish assigned missions. Operational control is inherent in combatant command (command authority). Also called COCOM. (JP 1-02)

combat service support. The essential capabilities, functions, activities, and tasks necessary to sustain all elements of operating forces in theater at all levels of war. Within the national and theater logistic systems, it includes but is not limited to that support rendered by service forces in ensuring the aspects of supply, maintenance, transportation, health services, and other services required by aviation and ground combat troops to permit those units to accomplish their missions in combat. Combat service support encompasses those activities at all levels of war that produce sustainment to all operating forces on the battlefield. Also called CSS. (JP 1-02)

combat service support element. The core element of a Marine air-ground task force (MAGTF) that is task-organized to provide the combat service support necessary to accomplish the MAGTF mission. The combat service support element varies in size from a small detachment to one or more force service support groups. It provides supply, maintenance, transportation, general engineering, health services, and a variety of other services to the MAGTF. The combat service support element itself is not a formal command. Also called CSSE. (JP 1-02)

commander, amphibious task force. The Navy officer designated in the order initiating the amphibious operation as the commander of the amphibious task force. Also called CATF. (JP 1-02)

commander, landing force. The officer designated in the order initiating the amphibious operation as the commander of the landing force for an amphibious operation. Also called CLF. (JP 1-02)

common-user sealift. The sealift services provided on a common basis for all Department of Defense agencies and, as authorized, for other agencies of the US Government. The Military Sealift Command, a transportation component command of the US Transportation Command, provides common-user sealift for which users reimburse the transportation accounts of the Transportation Working Capital Fund. (JP 1-02)

containership cargo stowage adapter. Serves as the bottom-most temporary deck and precludes the necessity of strengthening of tank tops or the installation of hard points on decks, thereby accelerating containership readiness. (Upon approval of this revision, this term and its definition will modify the existing term and its definition and will be included in the next edition of JP 1-02.)

corps support command. Provides corps logistic support and command and control of water supply battalions. (JP 1-02)

coxswain. A person in charge of a small craft (in the Army, a Class B or smaller craft) who often functions as the helmsman. For a causeway ferry, the pilot is in charge with the coxswain performing helmsman functions. (JP 1-02)

current. A body of water moving in a certain direction and caused by wind and density differences in water. The effects of a current are modified by water depth, underwater topography, basin shape, land masses, and deflection from the earth's rotation. (JP 1-02)

current, offshore. Deep water movements caused by tides or seasonal changes in ocean water level. (JP 1-02)

current, rip. A water movement that flows from the beach through the surf zone in swiftly moving narrow channels. (JP 1-02)

cusps. Ridges of beach material extending seaward from the beach face with intervening troughs. (JP 1-02)

davit. A small crane on a vessel that is used to raise and lower small boats, such as lifeboats, side loadable warping tugs, or causeway sections. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

Defense Transportation System. That portion of the Nation's transportation infrastructure that supports Department of Defense common-user transportation needs across the range of military operations. It consists of those common-user military and commercial assets, services, and systems organic to, contracted for, or controlled by the Department of Defense. Also called DTS. (JP 1-02)

draft. 2. The depth of water that a vessel requires to float freely; the depth of a vessel from the water line to the keel. (JP 1-02)

dwell time. The time cargo remains in a terminal's in-transit storage area while awaiting shipment by clearance transportation. (JP 1-02)

elevated causeway system. An elevated causeway pier that provides a means of delivering containers, certain vehicles, and bulk cargo ashore without the lighterage contending with the surf zone. (JP 1-02)

expeditionary force. An armed force organized to accomplish a specific objective in a foreign country. (JP 1-02)

fairway. A channel either from offshore, in a river, or in a harbor that has enough depth to accommodate the draft of large vessels. (JP 1-02)

fender. An object, usually made of rope or rubber, hung over the side of a vessel to protect the sides from damage caused by impact with wharves or other craft. (JP 1-02)

flatrack. Portable, open-topped, open-sided units that fit into existing below-deck container cell guides and provide a capability for container ships to carry oversized cargo and wheeled and tracked vehicles. (JP 1-02)

Fleet Marine Force. A balanced force of combined arms comprising land, air, and service elements of the US Marine Corps. A Fleet Marine Force is an integral part of a US Fleet and has the status of a type command. Also called FMF. (JP 1-02)

floating craft company. A company-sized unit made up of various watercraft teams such as tugs, barges, and barge cranes. (JP 1-02)

force module. A grouping of combat, combat support, and combat service support forces, with their accompanying supplies and the required nonunit resupply and personnel necessary to sustain forces for a minimum of 30 days. The elements of force modules are linked together or are uniquely identified so that they may be extracted from or adjusted as an entity in the Joint Operation Planning and Execution System databases to enhance flexibility and usefulness of the operation plan during a crisis. Also called FM. (JP 1-02)

foreshore. That portion of a beach extending from the low water (datum) shoreline to the limit of normal high water wave wash. (JP 1-02)

gear. A general term for a collection of spars, ropes, blocks, and equipment used for lifting and stowing cargo and ships stores. (JP 1-02)

gradient. The rate of inclination to horizontal expressed as a ratio, such as 1:25, indicating a one unit rise to 25 units of horizontal distance. (JP 1-02)

gross weight. 1. Weight of a vehicle, fully equipped and serviced for operation, including the weight of the fuel, lubricants, coolant, vehicle tools and spares, crew, personal equipment and load. 2. Weight of a container or pallet including freight and binding. Also called WT. (JP 1-02)

hatch. An opening in a ship's deck giving access to cargo holds. (JP 1-02)

headquarters and service battalion of the force service support group. A support group that provides command, control, and communications, security, and automated data processing for the force service support group. It provides supporting services to the Marine air-ground task force, including general support data processing, disbursing, postal, and exchange services. Also called H&S. (This term and its definition are applicable only in the context of this publication and cannot be referenced outside this publication.)

heavy-lift cargo. 1. Any single cargo lift, weighing over 5 long tons, and to be handled aboard ship. 2. In Marine Corps usage, individual units of cargo that exceed 800 pounds in weight or 100 cubic feet in volume. (JP 1-02)

hinterland, far. That region surrounding a beach or terminal operation to the extent that it has characteristics that affect the operation — normally within 100 miles. (JP 1-02)

hinterland, near. The area of land within an operational area of a specific beach or terminal operation — usually within 5 miles. (JP 1-02)

hold. 1. A cargo stowage compartment aboard ship. (JP 1-02)

inland petroleum distribution system. A multi-product system consisting of both commercially available and military standard petroleum equipment that can be assembled by military

personnel and, when assembled into an integrated petroleum distribution system, provides the military with the capability required to support an operational force with bulk fuels. The inland petroleum distribution system is comprised of three primary subsystems: tactical petroleum terminal, pipeline segments, and pump stations. Engineer units install the pipeline and construct the pump stations; Quartermaster units install the theater petroleum terminal and operate the total system when it is completed. Also called IPDS. (JP 1-02)

issue control group. A detachment that operates the staging area, consisting of holding areas and loading areas, in an operation. (JP 1-02)

joint logistics over-the-shore commander. The joint logistics over-the-shore (JLOTS) commander is selected by the joint force commander (JFC) and is usually from either the Army or Navy components that are part of the JFC's task organization. This individual then builds a joint headquarters from personnel and equipment in theater to organize the efforts of all elements participating in accomplishing the JLOTS mission having either wet or dry cargo or both. JLOTS commanders will usually integrate members from each participating organization to balance the overall knowledge base in their headquarters. (JP 1-02)

joint logistics over-the-shore operations. Operations in which Navy and Army logistics over-the-shore (LOTS) forces conduct LOTS operations together under a joint force commander. Also called JLOTS operations. (JP 1-02)

landing craft. A craft employed in amphibious operations, specifically designed for carrying troops and their equipment and for beaching, unloading, and retracting. It is also used for resupply operations. (JP 1-02)

lighterage. The process in which small craft are used to transport cargo or personnel from ship to shore. Lighterage may be performed using amphibians, landing craft, discharge lighters, causeways, and barges. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

lightweight amphibious container handler. A United States Marine Corps piece of equipment usually maneuvered by a bulldozer and used to retrieve 20-foot equivalent containers from landing craft in the surf and place them on flatbed truck trailers. (JP 1-02)

logistic marking and reading symbology. A system designed to improve the flow of cargo through the seaport of embarkation and debarkation using bar code technology. (JP 1-02)

logistics over-the-shore operation area. That geographic area required to conduct a logistics over-the-shore operation. Also called LOA. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

logistics over-the-shore operations. The loading and unloading of ships without the benefit of deep draft-capable, fixed port facilities; or as a means of moving forces closer to tactical assembly areas dependent on threat force capabilities. Also called LOTS operations. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

long ton. 2.240 pounds. Also called LT; L/T; or LTON. (JP 1-02)

main deck. The highest deck running the full length of a vessel (except for an aircraft carrier's hanger deck). (JP 1-02)

Marine air-ground task force. The Marine Corps principal organization for all missions across the range of military operations, composed of forces task-organized under a single commander capable of responding rapidly to a contingency anywhere in the world. The types of forces in the Marine air-ground task force (MAGTF) are functionally grouped into four core elements: a command element, an aviation combat element, a ground combat element, and a combat service support element. The four core elements are categories of forces, not formal commands. The basic structure of the MAGTF never varies, though the number, size, and type of Marine Corps units comprising each of its four core elements will always be mission dependent. The flexibility of the organizational structure allows for one or more subordinate MAGTFs to be assigned. Also called MAGTF. (JP 1-02)

Marine expeditionary brigade. A Marine air-ground task force that is constructed around a reinforced infantry regiment, a composite Marine aircraft group, and a brigade service support group. The Marine expeditionary brigade (MEB), commanded by a general officer, is task-organized to meet the requirements of a specific situation. It can function as part of a joint task force, as the lead echelon of the Marine expeditionary force (MEF), or alone. It varies in size and composition, and is larger than a Marine expeditionary unit but smaller than a MEF. The MEB is capable of conducting missions across the full range of military operations. Also called MEB. (JP 1-02)

Marine expeditionary force. The largest Marine air-ground task force (MAGTF) and the Marine Corps principal warfighting organization, particularly for larger crises or contingencies. It is task-organized around a permanent command element and normally contains one or more Marine divisions, Marine aircraft wings, and Marine force service support groups. The Marine expeditionary force is capable of missions across the range of military operations, including amphibious assault and sustained operations ashore in any environment. It can operate from a sea base, a land base, or both. Also called MEF. (JP 1-02)

Marine expeditionary unit. A Marine air-ground task force (MAGTF) that is constructed around an infantry battalion reinforced, a helicopter squadron reinforced, and a task organized combat service support element. It normally fulfills Marine Corps forward sea-based deployment requirements, The Marine expeditionary unit provides an immediate reaction capability for crisis response and is capable of limited combat operations. Also called MEU. (JP 1-02)

Maritime Administration Ready Reserve Force. The Maritime Administration (MARAD) Ready Reserve Force is composed of 68 surge sealift assets owned and operated by the US Department of Transportation/MARAD and crewed by civilian mariners. In time of contingency or exercises, the ships are placed under the operational command of the Military Sealift Command. (This term and its definition modify the existing term "Ready Reserve Force" and its definition and are approved for inclusion in the next edition of JP 1-02.)

maritime pre-positioning force operation. A rapid deployment and assembly of a Marine expeditionary force in a secure area using a combination of intertheater airlift and forward-deployed maritime pre-positioning ships. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

maritime pre-positioning ships. Civilian-crewed, Military Sealift Command-chartered ships that are organized into three squadrons and are usually forward-deployed. These ships are loaded with pre-positioned equipment and 30 days of supplies to support three Marine expeditionary brigades. Also called MPS. (JP 1-02)

measurement ton. The unit of volumetric measurement of equipment associated with surface-delivered cargo. Measurement tons equal total cubic feet divided by 40 (1MTON = 40 cubic feet). Also called M/T, MT, MTON. (JP 1-02)

Military Sealift Command. A major command of the US Navy, and the US Transportation Command's component command responsible for designated common-user sealift transportation services to deploy, employ, sustain, and redeploy US forces on a global basis. Also called MSC. (JP 1-02)

Military Sealift Command-controlled ships. Those ships assigned by the Military Sealift Command (MSC) for a specific operation. They may be MSC nucleus fleet ships, contract operated MSC ships, MSC-controlled time or voyage-chartered commercial ships, or MSC controlled ships allocated by the Maritime Administration to MSC to carry out Department of Defense objectives. (JP 1-02)

Military Sealift Command force. The Military Sealift Command (MSC) force common-user sealift consists of three subsets: the Naval Fleet Auxiliary Force, common-user ocean transportation, and the special mission support force. These ship classes include government-owned ships (normally civilian-manned) and ships acquired by MSC charter or allocated from other government agencies. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

mobile inshore undersea warfare unit. A Navy surveillance unit that provides seaward security to joint logistics over-the-shore operations from either a port or harbor complex or unimproved beach sites. The mobile inshore undersea warfare unit is equipped with mobile radar, sonar, and communications equipment located within a mobile van. Also called MIUWU. (JP 1-02)

moored. Lying with both anchors down or tied to a pier, anchor buoy, or mooring buoy. (JP 1-02)

National Defense Reserve Fleet. 1. Including the Ready Reserve Force, a fleet composed of ships acquired and maintained by the Maritime Administration (MARAD) for use in mobilization or emergency. 2. Less the Ready Reserve Force, a fleet composed of the older dry cargo ships, tankers, troop transports, and other assets in MARAD's custody that are maintained at a relatively low level of readiness. They are acquired by MARAD from commercial ship operators under the provisions of the Merchant Marine Act of 1936 and are available only on mobilization or congressional declaration of an emergency. Because the ships are maintained in a state of minimum preservation, activation requires 30 to 90 days and extensive shipyard work, for many. Also called NDRF. (JP 1-02)

nautical mile. A measure of distance equal to one minute of arc on the Earth's surface. The United States has adopted the international nautical mile equal to 1,852 meters or 6,076.11549 feet. Also called nm. (JP 1-02)

naval beach group. A permanently organized naval command within an amphibious force comprised of a commander and staff, a beachmaster unit, an amphibious construction battalion, and assault craft units, designed to provide an administrative group from which required naval tactical components may be made available to the attack force commander and to the amphibious landing force commander. Also called NBG. (JP 1-02)

Navy cargo handling battalion. A mobile logistic support unit capable of worldwide deployment in its entirety or in specialized detachments. It is organized, trained, and equipped to: a. load and offload Navy and Marine Corps cargo carried in maritime pre-positioning ships and merchant breakbulk or container ships in all environments; b. operate an associated temporary ocean cargo terminal; c. load and offload Navy and Marine Corps cargo carried in military-controlled aircraft; and d. operate an associated expeditionary air cargo terminal. Also called NCHB or Navy CHB. Two sources of Navy cargo handling battalions are: a. Navy cargo handling and port group — The active duty, cargo handling, battalion-sized unit composed solely of active duty personnel. Also called NAVCHAPGRU. b. Naval Reserve cargo handling battalion — A reserve cargo handling battalion composed solely of selected reserve personnel. Also called NRCHB. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

Navy cargo handling force. The combined cargo handling units of the Navy, including primarily the Navy cargo handling and port group, the Naval Reserve cargo handling training battalion, and the Naval Reserve cargo handling battalion. These units are part of the operating forces and represent the Navy's capability for open ocean cargo handling. Also called NCHF. (JP 1-02)

officer in tactical command. In maritime usage, the senior officer present eligible to assume command, or the officer to whom the senior officer has delegated tactical command. Also called OTC. (JP 1-02)

offshore bulk fuel system. The system used for transferring fuel from points offshore to reception facilities on the beach. It consists of two subsystems: amphibious bulk liquid transfer system and the offshore petroleum discharge system. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

offshore petroleum discharge system. Provides a semipermanent, all-weather facility for bulk transfer of petroleum, oils, and lubricants (POL) directly from an offshore tanker to a beach termination unit (BTU) located immediately inland from the high watermark. POL then is either transported inland or stored in the beach support area. Major offshore petroleum discharge systems (OPDS) components are: the OPDS tanker with booster pumps and spread mooring winches; a recoverable single anchor leg mooring (SALM) to accommodate tankers of up to 70,000 deadweight tons; ship to SALM hoselines; up to 4 miles of 6-inch (internal diameter) conduit for pumping to the beach; and two BTUs to interface with the shoreside systems. OPDS can support a two-line system for multiproduct discharge, but ship standoff distance is reduced from 4 to 2 miles. Amphibious construction battalions install the OPDS with underwater construction team assistance. OPDS are embarked on selected Ready Reserve Force tankers modified to support the system. Also called OPDS. (Upon approval of this revision, this term and its definition will modify the existing term and its definition and will be included in JP 1-02.)

operational control. Command authority that may be exercised by commanders at any echelon at or below the level of combatant command. Operational control is inherent in combatant command (command authority) and may be delegated within the command. When forces are transferred within combatant commands, the command relationship the gaining commander will exercise (and the losing commander will relinquish) over these forces must be specified by the Secretary of Defense. Operational control is the authority to perform those functions of command over subordinate forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission. Operational control includes authoritative direction over all aspects of military operations and joint training necessary to accomplish missions assigned to the command. Operational control should be exercised through the commanders of subordinate organizations. Normally this authority is exercised through subordinate joint force commanders and Service and/or functional component commanders. Operational control normally provides full authority to organize commands and forces and to employ those forces as the commander in operational control considers necessary to accomplish assigned missions, it does not, in and of itself, include authoritative direction for logistics or matters of administration, discipline, internal organization, or unit training. Also called OPCON. (JP 1-02)

outsized cargo. Cargo that exceeds the dimensions of oversized cargo and requires the use of a C-5 or C-17 aircraft or surface transportation. A single item that exceeds 1,000 inches long by 117 inches wide by 105 inches high in any one dimension. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

oversized cargo. 1. Large items of specific equipment such as a barge, side loadable warping tug, causeway section, powered, or causeway section, nonpowered. Requires transport by sea. 2. Air cargo exceeding the usable dimension of a 463L pallet loaded to the design height of 96 inches, but equal to or less than 1,000 inches in length, 117 inches in width, and 105 inches in height. This cargo is air transportable on the C-5, C-17, C-141, C-130, KC-10 and most civilian contract cargo carriers. (JP 1-02)

palletized unit load. Quantity of any item, packaged or unpackaged, which is arranged on a pallet in a specified manner and securely strapped or fastened thereto so that the whole is handled as a unit. (JP 1-02)

petroleum, oils, and lubricants. A broad term that includes all petroleum and associated products used by the Armed Forces. Also called **POL**. (Upon approval of this revision, this term and its definition will modify the existing term and its definition and will be included in JP 1-02.)

Pierson-Moskowitz scale. A scale that categorizes the force of progressively higher wind speeds. (JP 1-02)

reduced operating status. Applies to the Military Sealift Command ships withdrawn from full operating status (FOS) because of decreased operational requirements. A ship in reduced operating status is crewed for a level of ship maintenance and possible future operational requirements, with crew size predetermined contractually. The condition of readiness in terms of calendar days required to attain FOS is designated by the numeral following the acronym ROS (e.g., ROS-5) Also called ROS. (This term and its definition modify the existing term "reduced operational status" and its definition are approved for inclusion in the next edition of JP 1-02.)

refraction. The process by which the direction of a wave is changed when moving into shallow water at an angle to the bathymetric contours. The crest of the wave advancing in shallower water moves more slowly than the crest still advancing in deeper water, causing the wave crest to bend toward alignment with the underwater contours. (JP 1-02)

roll-on/roll-off discharge facility. Provides a means of disembarking vehicles from a roll-on and roll-off ship to lighterage. The roll-on/roll-off discharge facility consists of six causeway sections, nonpowered assembled into a platform that is two sections long and three sections wide. When use of landing craft, utility, as lighters, is being considered, a seventh "sea end" causeway section, non-powered, fitted with a rhino horn, is required. The roll-on/roll-off discharge facility assembly includes fendering, lighting, and a ramp for vehicle movement from ship to the platform. Also called RRDF. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

rough terrain container handler. A piece of materials handling equipment used to pick up and move containers. Also called RTCH. (JP 1-02)

safe haven. 3. A protected body of water or the well deck of an amphibious ship used by small craft operating offshore for refuge from storms or heavy seas. (JP 1-02)

sea state. A scale that categorizes the force of progressively higher seas by wave height. This scale is mathematically co-related to the Pierson-Moskowitz scale and the relationship of wind to waves (JP 1-02)

secondary wave breaker system. A series of waves superimposed on another series and differing in height, period, or angle of approach to the beach. (JP 1-02)

Service component command. A command consisting of the Service component commander and all those Service forces, such as individuals, units, detachments, organizations, and installations under that command, including the support forces that have been assigned to a combatant command or further assigned to a subordinate unified command or joint task force. (JP 1-02)

shoal. A sandbank or bar that makes water shoal; i.e., a sandbank that is not rocky and on which there is a water depth of 6 fathoms or less. (JP 1-02)

short ton. 2,000 pounds. Also called S/T or STON. (JP 1-02)

significant wave height. The average height of the third of waves observed during a given period of time. Significant wave height is used for evaluating the impact of waves and breakers on watercraft in the open sea and surf zones. (JP 1-02)

single-anchor leg mooring. A mooring facility dedicated to the offshore petroleum discharge system. Once installed, it permits a tanker to remain on station and pump in much higher sea states than is possible with a spread moor. Also called SALM. (JP 1-02)

single port manager. Through its transportation component commands, US Transportation Command is the Department of Defense-designated single port manager for all common-user aerial and sea ports worldwide. The single port manager performs those functions necessary to support the strategic flow of the deploying forces' equipment and sustainment from the aerial and sea port of embarkation and hand-off to the combatant commander in the aerial and sea port of debarkation (APOD and SPOD). The single port manager is responsible for providing strategic deployment status information to the combatant commander and to manage workload of the APOD and SPOD operator based on the commander's priorities and guidance. The single port manager is responsible through all phases of the theater aerial and sea port operations continuum, from an unimproved airfield and bare beach deployment to a commercial contract supported deployment. Also called SPM. (JP 1-02)

spreader bar. A device specially designed to permit the lifting and handling of containers or vehicles and breakbulk cargo. (JP 1-02)

strategic mobility. The capability to deploy and sustain military forces worldwide in support of national strategy. (JP 1-02)

strategic sealift. The afloat pre-positioning and ocean movement of military materiel in support of US and multinational forces. Sealift forces include organic and commercially acquired shipping and shipping services, including chartered foreign-flag vessels and associated shipping services. (JP 1-02)

strategic sealift forces. Sealift forces composed of ships, cargo handling and delivery systems, and the necessary operating personnel. They include US Navy, US Marine Corps, and US Army elements with Active and Reserve components. Merchant marine vessels manned by civilian mariners may constitute part of this force. (JP 1-02)

strategic sealift shipping. Common-user ships of the Military Sealift Command (MSC) force including pre-positioned ships after their pre-positioning mission has been completed and they have been returned to the operational control of MSC. (JP 1-02)

support. 1. The action of a force that aids, protects, complements, or sustains another force in accordance with a directive requiring such action. 2. A unit that helps another unit in battle. 3. An element of a command that assists, protects, or supplies other forces in combat. (JP 1-02)

supported commander. 1. The commander having primary responsibility for all aspects of a task assigned by the Joint Strategic Capabilities Plan or other joint operation planning authority. In the context of joint operation planning, this term refers to the commander who prepares operation plans or operation orders in response to requirements of the Chairman of the Joint Chiefs of Staff. 2. In the context of a support command relationship, the commander who receives assistance from another commander's force or capabilities, and who is responsible for ensuring that the supporting commander understands the assistance required. (JP 1-02)

supporting commander. 1. A commander who provides augmentation forces or other support to a supported commander or who develops a supporting plan. Includes the designated combatant commands and Defense agencies as appropriate. 2. In the context of a support command relationship, the commander who aids, protects, complements, or sustains another commander's force, and who is responsible for providing the assistance required by the supported commander. (JP 1-02)

Surface Deployment and Distribution Command. A major command of the US Army, and the US Transportation Command's component command responsible for designated continental United States land transportation as well as common-user water terminal and traffic management service to deploy, employ, sustain, and redeploy US forces on a global basis. Also called SDDC. (This term and its definition modify the existing term "Military Traffic Management Command" and its definition and are approved for inclusion in the next edition of JP 1-02.)

surf line. The point offshore where waves and swells are affected on by the underwater surface and become breakers. (JP 1-02)

surf zone. The area of water from the surf line to the beach. (JP 1-02)

swell. Ocean waves that have traveled out of their fetch. Swell characteristically exhibits a more regular and longer period and has flatter crests than waves within their fetch. (JP 1-02)

tactical control. Command authority over assigned or attached forces or commands, or military capability or forces made available for tasking, that is limited to the detailed direction and control of movements or maneuvers within the operational area necessary to accomplish missions or tasks assigned. Tactical control is inherent in operational control. Tactical control may be delegated to, and exercised at any level at or below the level of combatant command. When forces are transferred between combatant commands, the command relationship the gaining commander will exercise (and the losing commander will relinquish) over these forces must be specified by the Secretary of Defense. Tactical control provides sufficient authority for controlling and directing the application of force or tactical use of combat support assets within the assigned mission or task. Also called TACON. (JP 1-02)

tagline. A line attached to a draft of cargo or container to provide control and minimize pendulation of cargo during lifting operations. (JP 1-02)

terminal. A facility designed to transfer cargo from one means of conveyance to another. (Conveyance is the piece of equipment used to transport cargo; i.e., railcar to truck or truck to truck. This is as opposed to mode, which is the type of equipment; i.e., ship to rail, rail to truck.) (JP 1-02)

tophandler. A device specially designed to permit the lifting and handling of containers from the top with rough terrain container handlers. (JP 1-02)

topography. The configuration of the ground to include its relief and all features. Topography addresses both dry land and the sea floor (underwater topography). (JP 1-02)

transportation component command. The three component commands of United States Transportation Command. Air Force Air Mobility Command, Navy Military Sealift Command, and Army Surface Deployment and Distribution Command. Each transportation component command remains a major command of its parent Service and continues to organize, train, and equip its forces as specified by law. Each transportation component command also continues to perform Service-unique missions. Also called TCC. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

trim. The difference in draft at the bow and stern of a vessel or the manner in which a vessel floats in the water based on the distribution of cargo, stores and ballast aboard the vessel. (JP 1-02)

unified command. A command with a broad continuing mission under a single commander and composed of significant assigned components of two or more Military Departments, that is established and so designated by the President through the Secretary of Defense with the advice and assistance of the Chairman of the Joint Chiefs of Staff. Also called unified combatant command. (JP 1-02)

United States Transportation Command. The unified command with the mission to provide strategic air, land, and sea transportation for the Department of Defense, across the range of military operations. Also called USTRANSCOM. (JP 1-02)

warp. To haul a ship ahead by line or anchor. (JP 1-02)

watercraft. Any vessel or craft designed specifically and only for movement on the surface of the water. (JP 1-02)

wave. 1. A formation of forces, landing ships, craft, amphibious vehicles or aircraft, required to beach or land about the same time. Can be classified as to type, function or order as shown: a. assault wave; b. boat wave; c. helicopter wave; d. numbered wave; e. on-call wave; f. scheduled wave. 2. (DOD only) An undulation of water caused by the progressive movement of energy from point to point along the surface of the water. (JP 1-02)

wave crest. The highest part of a wave. (JP 1-02)

wave height. The vertical distance between trough and crest, usually expressed in feet. (JP 1-02)

wave length. The horizontal distance between successive wave crests measured perpendicular to the crest, usually expressed in feet. (JP 1-02)

wave period. The time it takes for two successive wave crests to pass a given point. (JP 1-02)

wave trough. The lowest part of the wave between crests. (JP 1-02)

wave velocity. The speed at which a wave form advances across the sea, usually expressed in knots. (JP 1-02)

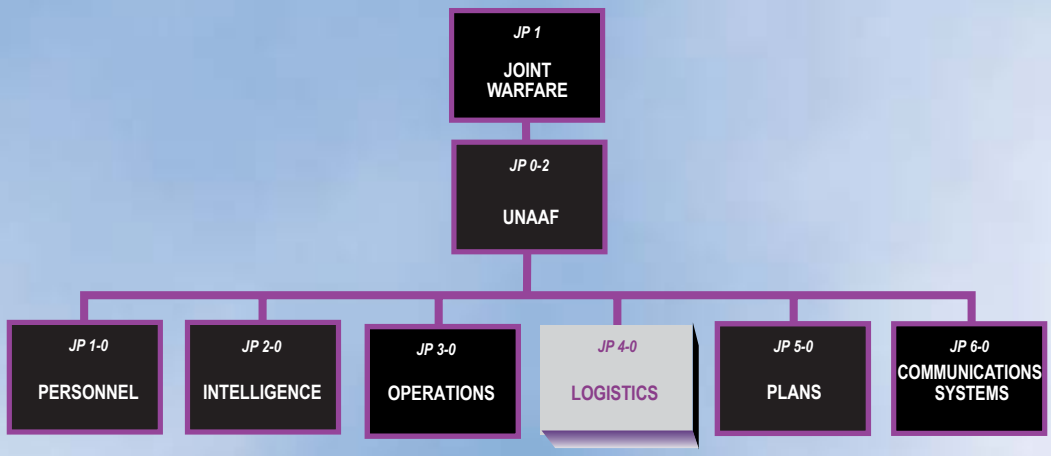
weather deck. A deck having no overhead protection; uppermost deck. (JP 1-02)

white cap. A small wave breaking offshore as a result of the action of strong winds. (JP 1-02)

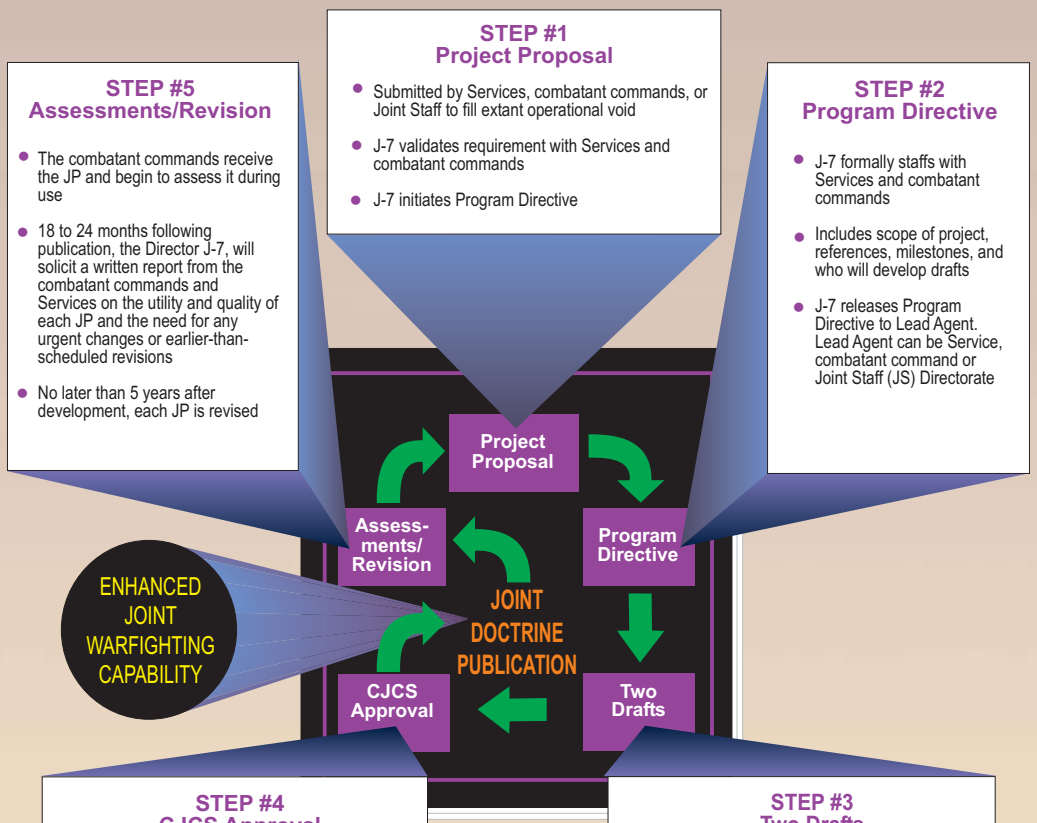
winch. A hoisting machine used for loading and discharging cargo and stores or for hauling in lines. (JP 1-02)

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JOINT DOCTRINE PUBLICATIONS HIERARCHY



All joint doctrine and tactics, techniques, and procedures are organized into a comprehensive hierarchy as shown in the chart above. **Joint Publication (JP) 4-01.6** is in the **Logistics** series of joint doctrine publications. The diagram below illustrates an overview of the development process:




JOINT
CHIEFS OF STAFF