



Commander's Quick Reference AMPHIBIOUS WARFARE HANDBOOK

October 2016



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Commanding Officer Captain Paul Gilmartin sends appreciation to the staff of EWTGPAC and the amphibious community for their contributions and tireless effort in developing

The Commander's Amphibious Warfare Handbook.

A special thanks to:
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Amphibious Warfare Handbook

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Capabilities and Limitations

REFERENCES:

- a) JANE's, Amphibious & Special Forces
- b) NTTP 3-02.14, The Naval Beach Group
- c) NTTP 3-02.1M/MCWP 3-31.5, Ship-to-Shore Movement
- d) CNSL CNSP 3340.3, Wet Well Operations Manual
- e) SEAOPS Vol. VII
- f) MCRP 3-31B Amphibious Ships and Landing Craft Data Book

1. Amphibious Command Ships

The two Blue Ridge-class LCCs are the only ships designed from the keel up for amphibious/command ship role. After entering service, both ships largely have served as fleet flagships. Blue Ridge became the Seventh Fleet flagship and is forward deployed to Yokosuka, Japan. Mount Whitney serves as the Sixth Fleet flagship.

LCC 19 USS BLUE RIDGE

LCC 20 USS MOUNT WHITNEY

AMHIBIOUS COMMAND SHIPS-BLUE RIDGE CLASS (LCC)



USS MOUNT WHITNEY (LCC-20)

MISSION

- Designed specifically for the command and control of an amphibious operation with extensive communications, electronics, and computer equipment.



CHARACTERISTICS

LENGTH	SPEED:	BEAM:	COMPLEMENT:
634 FT	23+ KTS	108 FT	34 OFFICERS, 564 SAILORS
EMBARKED LANDING FORCE:	FLIGHT DECK: PLATFORM		
700 TROOPS	1 MH-60S		

2. Amphibious Assault Ships

Amphibious warships are designed to support the Marine Corps tenets of Operational Maneuver from the Sea (OMFTS) and Ship to Objective Maneuver (STOM). Because of their inherent capabilities, these ships have been and will continue to be called upon to support humanitarian and other contingency missions on short notice.

There are four types of Amphibious Ships

- a. Amphibious Assault Ship, General Purpose (LHA).
- b. Amphibious Assault Ship, Multi-Purpose (LHD).
- c. Amphibious Transport Dock (LPD).
- d. Dock Landing Ship (LSD).

The LHA and LHD are the largest of these ships and resemble a small aircraft carrier.

a. Amphibious Assault Ship, General Purpose (LHA)

America, the first of the LHA Replacement Program, is an aviation-centric variant of the LHD-8. This class ship is the only big-deck amphibious ships without a well deck.

LHA 6 USS AMERICA

LHA 7 USS TRIPOLI

AMPHIBIOUS ASSAULT SHIP-AMERICA CLASS (LHA)



USS AMERICA (LHA-6)

MISSION

- Multifunction amphibious assault ship.
- Designed to support F35B JSF, MV- 22B Osprey, and helicopter operations.
- The America class is optimized for aviation operations and does not contain a well deck for surface interface operations.
- Key differences between America and Wasp include an enlarged hangar deck, enhanced maintenance facilities, additional aviation storerooms and an electronically reconfigurable C4ISR suite.



CHARACTERISTICS

LENGTH:	SPEED:	WELL DECK CAPACITY:	MED COMPLEMENT:
844 FT	20+ KTS	N/A	2 OPERATING ROOMS, 24 BED HOSPITAL
EMBARKED LANDING FORCE:	CARGO CUBE (NET):	FLIGHT DECK:	ELEVATORS:
1518 MARINES	160K CUBIC FT	9 SPOTS: 3 STBD FOR AC STOWAGE	2 AIRCRAFT (1 STBD, 1 PORT)

b. Amphibious Assault Ship, Multi-Purpose (LHD)

The LHD class is similar to that of the LHA class ship. It has a full length flight deck, large storage areas for vehicles and cargo, and troop berthing for a reinforced battalion. It also has flag spaces designed to support the staff of a PHIBRON and MEU.

The LHD 1 class amphibious assault ship (multi-purpose) mission is to operate offensively in a high density, multi-threat environment as an integral member of an amphibious ready group (ARG). The ship is capable of functioning as an expeditionary strike group flagship. Facilities are provided for an embarked landing force command and staff and for an Expeditionary Strike Group (ESG) Commander and associated staff. It is able to conduct sustained amphibious operations after the initial assault. The ship is capable of interfacing with both vertical and surface connectors and conducting simultaneous flight deck and well deck operations.

LHD 1 USS WASP
 LHD 2 USS ESSEX
 LHD 3 USS KEARSARGE
 LHD 4 USS BOXER

LHD 5 USS BATAAN
 LHD 6 USS BONHOMME RICHARD
 LHD 7 USS IWO JIMA
 LHD 8 USS MAKIN ISLAND

AMPHIBIOUS ASSAULT SHIP-WASP CLASS (LHD)



USS WASP (LHD-1)

MISSION

- Provide Marine Corps with a means of ship-to-shore movement by air in addition to landing craft for both humanitarian-assistance, occupation, and combat operations.
- Designed to accommodate a mix of F-35B Joint Strike Fighters, MV-22 Osprey aircraft, helicopters and a LCAC.
- Embarks, deploys and lands elements of a landing force by VTOL aircraft, helicopter, landing craft and amphibian vehicles.



CHARACTERISTICS

LENGTH:	SPEED:	WELL DECK CAPACITY:	MED COMPLEMENT:
844 FT	20+ KTS	3 LCACs, 2 LCUs or 45 AAVs	6 OPERATING ROOMS, 600 BED HOSPITAL
EMBARKED LANDING FORCE:	CARGO CUBE (NET):	FLIGHT DECK:	ELEVATORS:
~1700 MARINES	93.8K CUBIC FT	9 SPOTS: 3 STBD FOR AC STOWAGE	2 AIRCRAFT (1 STBD, 1 PORT)

c. Amphibious Transport Dock (LPD)

The LPD San Antonio class warships are designed to embark, transport, and land elements of a landing force for amphibious assault, special operations or expeditionary warfare missions. They also serve as secondary aviation platforms for amphibious ready groups. They are designed as general purpose amphibious ships with substantial lift capacities for troops, vehicles, landing craft, cargo, and bulk fuel.

Serves as a helicopter platform for landing embarked troops and their supplies. LPDs are used to transport and land Marines, their equipment and supplies by LCACs, conventional landing craft, or AAVs augmented by helicopters or vertical take-off and landing aircraft (MV-22).

LPD 17 USS SAN ANTONIO
LPD 18 USS NEW ORLEANS
LPD 19 USS MESA VERDE
LPD 20 USS GREEN BAY
LPD 21 USS NEW YORK
LPD 22 USS SAN DIEGO

LPD 23 USS ANCHORAGE
LPD 24 USS ARLINGTON
LPD 25 USS SOMERSET
LPD 26 USS JOHN P MURTHA
LPD 27 PCU PORTLAND

AMPHIBIOUS TRANSPORT DOCK-SAN ANTONIO CLASS (LPD)



USS SAN ANTONIO (LPD-17)

MISSION

- Designed to embark, transport, launch and support the Marines Corp’s Mobility Triad of Advanced Amphibious Assault Vehicles, Landing Craft Air Cushion (LCACs) and MV-22 Osprey.
- Support amphibious assault, special operations or expeditionary warfare and can serve a secondary aviation platforms for ESGs.
- Can carry 2 CH-53E Helicopters or 2 MV-22 Osprey Aircraft or 4 UH-1 (Huey) Helicopters.



CHARACTERISTICS

LENGTH:	SPEED:	WELL DECK CAPACITY:	MED COMPLEMENT:
684 FT	22+ KTS	2 LCACs or 1 LCU & 14 AAVS	2 OPERATING ROOMS, 6 ICU, 22 WARDS
EMBARKED LANDING FORCE:	CARGO CUBE (NET):	FLIGHT DECK:	ELEVATORS:
~800 MARINES	35.9K CUBIC FT	6 SPOTS: 2 OPS SPOTS, 4 EXP SPOTS	2 CARGO: 6 & 8 TON, 1 LIGT PLATFORM: 3 TON

d. Dock Landing Ship (LSD)

The two classes of LSD, Whidbey Island and Harpers Ferry, support amphibious operations, which include landings via displaced, non-displaced landing craft and helicopters. These ships transport and launch amphibious craft and vehicles with their crews and embarked personnel in amphibious assault operations. LSD 41/49 class is not flag-configured and no unique facilities are provided for an embarked staff.

LSD 41 was designed specifically to operate LCACs and has the largest capacity for landing of any U.S. Navy amphibious platform.

WHIDBEY ISLAND CLASS

- LSD 41 USS WHIDBEY ISLAND
- LSD 42 USS GERMANTOWN
- LSD 43 USS FORT MCHENRY
- LSD 44 USS GUNSTON HALL

- LSD 45 USS COMSTOCK
- LSD 46 USS TORTUGA
- LSD 47 USS RUSHMORE
- LSD 48 USS ASHLAND

HARPERS FERRY CLASS

- LSD 49 USS HARPERS FERRY
- LSD 50 USS CARTER HALL

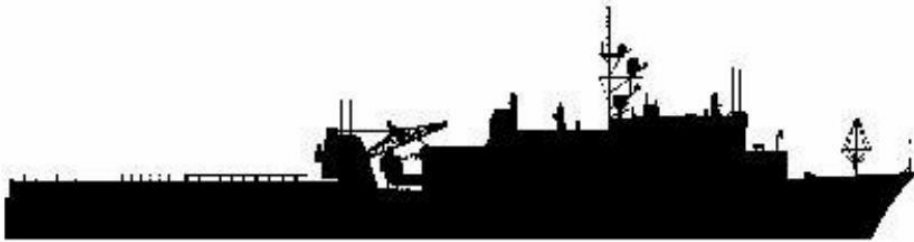
- LSD 51 USS OAK HILL
- LSD 52 USS PEARL HARBOR

DOCK LANDING SHIP-WHIDBEY ISLAND CLASS (LSD)



USS WHIDBEY ISLAND (LSD-41)

- MISSION**
- First dock landing ships specifically designed to operate LCACs.
 - Serves as docking and repair service for LCACs and conventional landing craft.
 - LSDs accommodate a sizable number of troops, but carry more cargo and vehicles than LPDs.



CHARACTERISTICS

LENGTH:	SPEED:	WELL DECK CAPACITY:	MED COMPLEMENT:
609 FT	20+ KTS	4 LCACs (5 LCACs in Admin Lift), 2 LCUs, 64 AAVs	1 OPERATING ROOM, 1 ICU, 5 WARDS
EMBARKED LANDING FORCE:	CARGO CUBE (NET):	FLIGHT DECK:	ELEVATORS/CRANE:
~500 MARINES	4.9K CUBIC FT	2 OPERATING SPOTS	1 CARGO 18K LBS/2 CRANES 30/60TONS

DOCK LANDING SHIP-HARPERS FERRY CLASS (LSD)



USS HARPERS FERRY (LSD-49)

MISSION

- Harpers Ferry variant favors greater cargo-carrying capacity, improved facilities for embarked troops and greater operating range.
- Transport and launch loaded amphibious craft and vehicles with their crews by landing craft and amphibious vehicles. It can render limited docking repair service to small ships and craft.



CHARACTERISTICS

LENGTH:	SPEED:	WELL DECK CAPACITY:	MED COMPLEMENT:
609 FT	20+ KTS	2 LCACs, 1 LCUs, 25 AAVs	1 OPERATING ROOM, 7 WARDS
EMBARKED LANDING FORCE:	CARGO CUBE (NET):	FLIGHT DECK:	ELEVATORS/CRANE:
~500 MARINES	67.7K CUBIC FT	2 OPERATING SPOTS	2 CARGO, 3 LIFT PLATFORM/1 CRANE 60 TON

3. Maritime Prepositioning Ships (MPS)

Maritime Prepositioning Force (MPF) ships are operated by the Military Sealift Command (MSC) and are a vital element of the Navy-Marine Corps seabasing capability. These ships are time chartered by and assigned to Military Sealift Command (MSC), and operated under contract by merchant shipping companies. Operational control is usually retained by the fleet commander. The primary purpose of the MPF program is enabling the rapid deployment of a fully capable Marine Air-Ground Task Force (MAGTF) anywhere in the world in support of our National Defense Strategy. To enable rapid availability during a major theater war, a humanitarian operation, or other contingency, each ship carries military equipment and supplies, thereby reducing reliance on other strategic sealift. This strategic capability combines the capacity and endurance of sealift with the speed of airlift. The MPS are loaded with maritime pre-positioned equipment and supplies (MPE/S) specifically associated with a Marine expeditionary brigade (MEB).

The MPF is inherently flexible to respond to a full spectrum of contingencies with effective power projection. Whether pier side, in-stream, or at sea, MPF ships have unique capabilities to deliver rolling stock, tracked vehicles, ammunition, supplies, bulk fuel and water. The ships are divided into two Maritime Prepositioning Ship Squadrons (MPSRON). MPSRON-2 is sited at Diego Garcia and MPSRON-3 is sited at Guam/Saipan.


The MPF program currently has 12 prepositioning ships, including four LMSRs, two T-AKEs, and six T-AKs. Once operationally available, Expeditionary Transfer Dock (T-ESD) will be added to the MSC inventory bringing the total to 14 prepositioning ships. The new ESDs will provide combatant commanders new seabasing-enabled capabilities for selective offload and sustainment operations. Detailed information on the latest MPS can be accessed by visiting the USMC Prepositioning web site at: <https://mcpic.bic.usmc.mil> or on the Military Sealift Command (MSC) website.

a. Bobo Class (T-AK)

The T-AK BOBO Class are Large, Medium-Speed, Roll-on/Roll-off Ship or LMSR, dry cargo ships that preposition equipment and supplies in strategic locations at sea for rapid delivery ashore in response to military or humanitarian crises. These ships are capable of conducting RO/RO and or LO/LO operations pier side and in stream, and are capable of providing shipboard aviation facilities for Level 2, Class 3/4 in support of limited cargo and personnel transport operations.

T-AK 3008 USNS 2nd LT JOHN P. BOBO
 T-AK 3009 USNS PFC DEWAYNE T. WILLIAMS
 T-AK 3010 USNS 1ST LT BALDOMERO LOPEZ

T-AK 3011 USNS 1ST LT JACK LUMMUS
 T-AK 3012 USNS SGT WILLIAM R. BUTTON

MPF CONTAINER AND RO/RO CLASS (T-AK)		
 <p>USNS 2nd LT JOHN P. BOBO</p>		MISSION
		<ul style="list-style-type: none"> • Provide services when called upon as dry cargo-carrying surge sealift ships. • Provide equipment to sustain a MAGTF for up to 30 days. Discharges cargo in port or at sea using organic lighterage. • LMSR ships are not armed and do not have ship self-defense systems • Designed to carry vehicles and other cargo, along with barges and cranes to offload cargo ashore. It also carries a bulk liquid transfer system that enables it to transfer water and fuel quickly and in mass quantities
CHARACTERISTICS		
LENGTH:	SPEED:	LIFT CAPACITY:
754 FT	17.7+ KTS	3-MPFUBs, ABLTS, 3-BMs, 1-WT, 3-IMs, 3-CFPMs, 2-LARC
FLIGHT DECK:	SURFACE INTERFACE POINT:	CAPABILITY:
1 OPERATING SPOT	INLS, MPFUB, LCM-8	RO/RO: 152K SQ FT, LO/LO: 5CRANES

b. Bob Hope Class and Watson Class (T-AKR)

The T-AKR, also known as the Large, Medium-Speed, Roll-on/Roll-off Ship or LMSR, is among the largest cargo ships in the world and can carry 350,000 to 390,000 square feet of combat cargo (the equivalent of more than six football fields) at speeds up to 24 knots. These ships are capable of self-sustained roll-on/roll-off (RO/RO) and lift-on/lift-off (LO/LO) operations at a pier and also in a Logistics-Over-the-Shore (LOTS) scenario via stern ramps to a RO/RO Discharge Facility (RRDF). In addition, the LMSR is capable of self-sustained LO/LO cargo operations in a LOTS scenario by interfacing with lighterage.

BOB HOPE CLASS

T-AKR 300 USNS BOB HOPE
T-AKR 302 USNS SEAY

T-AKR 304 USNS PILILAAU

WATSON CLASS

T-AKR 310 USNS WATSON
T-AKR 311 USNS SISLER

T-AKR 312 USNS DAHL

CONTAINER AND ROLLING STOCK CLASS (T-AKR)



USNS SISLER

MISSION

- Carries containerized cargo and rolling stock.
- LMSR ships are not armed and do not have ship self-defense systems.
- While having a smaller cube capacity than the T-AKs, it provides over twice the square footage for storage. In general, both classes are quite similar; however, the fuel consumption of the Watson class is significantly higher than the Bob Hope Class.

CHARACTERISTICS

LENGTH:	SPEED:	LIFT CAPACITY:
950 FT	24+ KTS	1-MPFUB, 3-BMs, 1-WT, 6-CMs, 1-RM, 1-DM, CCS
FLIGHT DECK:	SURFACE INTERFACE POINT:	CAPABILITY:
1 OPERATING SPOT	0	LO/LO 2 CRANES

c. T-ESD Montford Point Class

The Expeditionary Transfer Dock, also known as the T-ESD, is a cornerstone of Navy-Marine Corps seabasing capabilities and is designed to increase intra-theater agility, enhance throughput capability for the MPF, and support a broad range of military operations. It serves as a transfer point within the seabase by facilitating delivery of vehicles, equipment, personnel and supplies in the seabase, from ship-to-ship, ship-to-shore and in restricted access locations ashore.

The Expeditionary Mobile Base (T-ESB) variant will act as a low cost base for mine counter measure (MCM) helicopters and special operations forces. This ship will field an extremely large helicopter deck capable of supporting multiple CH-53s and MV-22s and accommodations for up to 250 embarked personnel, but lacks landing craft berths as in the T-ESD variant. These ships will be capable of supporting multiple missions including airborne mine countermeasures, counter piracy, maritime security, humanitarian-aid and disaster-relief missions.

T-ESD MONTFORD POINT CLASS

T-ESD 1 USNS MONTFORD POINT


T-ESD 2 USNS JOHN GLENN

T-ESB LEWIS B PULLER CLASS

T-ESB 3 USNS LEWIS B PULLER

T-ESB 4 USNS HERSHEL WILLIAMS

Note: A third ESB (T-ESB 5) was appropriated by Congress in FY16, ship name to be determined by SECNAV.

MONTFORD POINT CLASS		
		MISSION
<p>T-ESD 1 USNS Montford Point</p>		<ul style="list-style-type: none"> By leveraging float-on/float-off (FLO/FLO) technology and a reconfigurable mission deck, the T-ESD is transformed into a seagoing pier when access to on-shore bases and support are unavailable. Integrating non-displacement connectors into the offload mitigates natural obstacles and increases the percentage of usable beaches which further thwarts anti-access/area denial (A2/AD) measures. Based on potential missions associated with the-ESB platform and legal considerations associated with civilian mariners, there are higher headquarters discussions on temporarily commissioning ESB to accomplish specific mission sets (i.e. making them USS vice USNS).
CHARACTERISTICS		
LENGTH:	SPEED:	LIFT CAPACITY:
784 FT	15+ KTS	NA
FLIGHT DECK:	SURFACE INTERFACE POINT:	CAPABILITY:

1 OPERATING SPOT

3 LCAC BERTHS

RO/RO: 25K SQ FT, LO/LO: NONE

4. Amphibious Landing Craft/Platforms

Displacement and non-displacement landing craft are used to land troops, equipment, and supplies. The capabilities and operating criteria of these landing craft are discussed in detail in NTRP 3-02.1.2; NWP 3- 02.12/MCRP 3-31.1A, Employment of Landing Craft Air Cushion (LCAC); MCRP 3-31B, Amphibious Ships and Landing Craft Data Book; LCAC SEAOPS; COMNAVSURFLANTINST/COMNAVSURFPACINST 3840.1B, Joint Surf Manual; and COMNAVSURFLANTINST/COMNAVSURFPACINST 3340.3, Wet Well Operations Manual.

LANDING CRAFT MECHANIZED VIII (LCM-8)



LCM-8 CLASS



MISSION

- Landing craft capable of transporting tracked and/or wheeled vehicles and troops from amphibious assault ships to beachheads or piers.
- Feature bow ramp for on-load and off-load.
- Designated as Medical Boat in MPF Operations.

CHARACTERISTICS

LENGTH:	SPEED:	LIFT CAPACITY:	CARGO HANDLING:
73.7 FT	12+ KTS	60 TONS, 1 TANK , or 150 COMBAT-LOADED TROOPS	VIA BOW RAMP OR CRANE OPERATIONS
BEAM:	DRAFT:	RAMP WIDTH:	LIMITATIONS:
21 FT	5.2 FT	14.5 FT	MAX SURF - 8 FT

LANDING CRAFT UTILITY (LCU)



LCU TYPE

MISSION

- Landing craft capable of transporting tracked and/or wheeled vehicles and troops from amphibious assault ships to beachheads or piers.

Planning Considerations:

- Primary ACU assault craft – transports heavy vehicles, equipment, personnel and cargo from ship to shore.
- Can provide OPDEC, OTH, PCS capabilities.
- Craft carried in well-deck are normally pre-loaded.
- Has both a bow ramp and stern gate, permitting passage of vehicles less than 13.5' in width. (May be used in conjunction with other LCUs as a causeway section under ideal sea conditions.)
- Self-sufficient for up to 10 days without resupply/fuel.
- At distances of 10 NM or less, can deliver LAVs and tanks more efficiently than 1 LCAC.
- Ineffective landing on a defended beach as the main weapon batteries (50 cal) is not capable of engaging a target forward of the craft.

CHARACTERISTICS

LENGTH:	SPEED:	LIFT CAPACITY:	CARGO HANDLING:
135 FT	11+ KTS	160 TONS, 1 M1A1 TANK , 10 LAVs, or 400 COMBAT-LOADED TROOPS	VIA BOW RAMP, CRANE OPERATIONS, OR DRIVE THROUGH STERN GATE
BEAM:	DRAFT:	RAMP WIDTH:	LIMITATIONS:
29 FT	3.5 FT FWD 6.3 FT AFT	14 FT BOW 18 FT STERN	ENDURANCE:10 DAYS MAX MSI: 12 WARTIME 6 TRAINING 4 W/O SEAWARD SALV.

LANDING CRAFT AIR CUSHION (LCAC)

MISSION



LCAC

- Provides Navy with OTH capability of up to 200 nm in conjunction with Marine Corps rotary wing aircraft - transports equipment, personnel, cargo, and weapons from ships through surf zone and across the beach to hard landing points beyond high-water mark. Combines heavy lift capability of surface assault with high-speed capability of helo-borne assault. Capable of traveling over land and water, opening 70% of the world's littoral area to amphibious operations.
- Craft is designed as part of the Top Level Requirement as lift capability of 60 TON in normal, but has capability of 70 Tons in an overload condition (used with waivers).

Planning Considerations:

- 50-yd-radius separation required between LCACs on beach.
- 20 minutes required between waves to allow offload and retraction.
- 500-yd separation between LCAC and conventional landing craft approach lanes and beaches required.
- Not designed to assault defended beaches – guns cannot be mounted or manned until on the beach.
- Wind and salt spray damages embarked equipment when left on craft for long periods of operating time.
- LCAC cushion operations require maintaining speeds above 18-20 kts (“hump speed”). High speeds also require more room for maneuvering.
- Range: 200 NM at 50 knots SWH of .5-1.0 FT.

CHARACTERISTICS

LENGTH:	SPEED:	LIFT CAPACITY:	CARGO HANDLING:
88 FT	50+ KTS	23 TROOPS (15 COMBAT-LOADED WITHOUT PTM INSTALLED) & 70 TONS (CARGO, 1 M1A1, or 4 LAVs) or 180 TROOPS IN PERSONNEL TRANSPORT MODULE (PTM)	VIA BOW RAMP, CRANE OPERATIONS, OR DRIVE THROUGH STERN GATE
BEAM:	DRAFT:	RAMP WIDTH:	LIMITATIONS:

47 FT	2.9 FT (OFF CUSHION)	28 FT BOW 14 FT STERN	MAX SURF - 8FT
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ASSAULT AMPHIBIOUS VEHICLE (AAV7A1)



AAV

MISSION

- Personnel (AAVP): Provide armor protected transportation for landing forces, and their supporting equipment and supplies.
- Command (AAVC): Mobile command post designed to give the commander the basic communication capability of a static combat operations center.
- Recovery (AAVR): Recovery of AAV or similar size craft and vehicles from open ocean, surf, swamps, etc. Provides the basic maintenance equipment necessary for first-through third-echelon maintenance and repair of the AAV family of vehicles in the field.

Planning Considerations:

- One safety boat required for five or less AAVs, and two safety boats required for six or more AAVs while in water.

CHARACTERISTICS

LENGTH:	SPEED:	LIFT CAPACITY:	CARGO HANDLING:
25.9 FT	LAND: 25+ MPH WATER: 8+ KTS	AAVC: 8 TROOPS & 2000 LBS AAVP/R:21 TROOPS AND 10,000 LBS CARGO	VIA STERN GATE 28 TONS COMBAT LOADED, 23 TONS UNLOADED
BEAM:	FUEL CAPACITY:	RAMP WIDTH:	LIMITATIONS:

10.7 FT	171 GALLONS	WIDE: 6 FT HEIGHT: 5.5 FT	RANGE: LAND: 25 MPH, 300 MILES WATER: 6-8 KTS, 5NM SAFE SWIM 2.5NM OR < MAX SS: <5 WARTIME <3 TRAINING *SS: SEA STATE
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5. Support Craft

Vehicles and support equipment assigned to a Beach Group or Assault Craft Unit (ACU) may vary depending on the scope of the operation. Although the primary purpose of support vehicles is to provide transportation for personnel and equipment, many of the vehicles are designed for specific tasks on the beach.

LIGHTER AMPHIBIOUS RESUPPLY CARGO 5 TON (LARC-V (A1/A2))



LARC-V

MISSION

- The LARC-V is primarily used for surf-zone salvage, recovery, command and control roles, and for the transportation of personnel and equipment. The craft is capable of operation in temperate, tropic, and arctic climates.
- It is capable of traversing sand and coral beaches, unimproved roads, off-road terrain, and of maneuvering through surf of 10-foot breakers.
- The versatility of the LARC-V makes it capable of performing a variety of other tasks such as serving as a diving platform, supporting underwater and waterfront construction, and performing light tug operations.

Operations:

- I. Boat salvage and raising inoperable ramps for LCM-8 boats.
- II. Safety boat in support of lifeguard detail during surf operations.
- III. Transfer of material or personnel between beach and offshore vessels.
- IV. Towing disabled or stranded vehicles clear of landing craft.

CHARACTERISTICS

LENGTH:	SPEED:	LIFT CAPACITY:	CARGO HANDLING:
35 FT	22MPH (LAND) 7.5 (SEA)	LAND: 10,000 LBS SEA: 4,000 LBS TROOPS: 20 PERSONNEL TOW: 29,000 LBS	FORKLIFT VIA REMOVABLE SIDE GATES
BEAM:	HEIGHT:	RANGE:	LIMITATIONS:
10 FT	10 FT 2 IN	LAND: 285-335 MILES SEA: 40 NM	GRD CLEARANCE: 24 IN TURNING RADIUS: 35 FT MAX MSI: 9 WARTIME 6 TRAINING

IMPROVED NAVY LIGHTERAGE SYSTEM (INLS)



INLS

MISSION

- INLS is a sectional craft with floating sections that lock together like building blocks to create a variety of floating structures such as causeways, docks, and ferries.
- Allow Navy ships to transport heavy equipment such as tanks and trucks, to shore, and cargo, such as food, water, and equipment parts, between ships and from ship to shore when moorings have been damaged or unavailable.
- Can operate in Sea State 3 and survive in Sea State 5.

CHARACTERISTICS

THE INLS CONSISTS OF THE WARPING TUG (WT), CAUSEWAY FERRY POWER MODULE (CFPM), CAUSEWAY FERRY (CF), ROLL-ON/ROLL-OFF DISCHARGE FACILITY (RRDF) AND FLOATING CAUSEWAY (FC) PIER. WITH THE EXCEPTION OF THE WT WHICH IS A STANDALONE CRAFT, THE CF, RRDF AND FC ARE CONSTRUCTED BY END CONNECTING/SIDE CONNECTING VARIOUS COMBINATIONS OF THE FOLLOWING MODULES:

- CFPM
- INTERMEDIATE MODULE (IM)
- COMBINATION MODULE (CM)
- BEACH MODULE (BM)
- DOCKING MODULE (DM)
- RAMP MODULE (RM)

THE MOST COMMON CF CONSTRUCTED IS THE "PLUS TWO" CONFIGURATION BY END CONNECTING THE CFPM, ONE IM AND ONE BM.

THE RRDF IS NORMALLY CONFIGURED IN A 3 MODULE WIDE AND 3 MODULE LONG CONFIGURATIONS TO FORM A 240-FOOT BY 72-FOOT PLATFORM. THE MODULAR DESIGN ALLOWS MAXIMUM FLEXIBILITY TO CONFIGURE THE RRDF TO SUPPORT NUMEROUS REQUIREMENTS.

THE FC IS COMPOSED OF 19 MODULES, 15 OF WHICH ARE END CONNECTED TO FORM A FLOATING PIER 1200 FEET IN LENGTH WITH A THREE STATION PIER HEAD.

WARPING TUG (WT)



WT

MISSION

- Perform salvage operations.
- Assemble, install, tend, retract and disassemble INLS systems.
- Lay and retrieve anchors.

CHARACTERISTICS

LENGTH:	SPEED:	A-FRAME CAPACITY:
87 FT 9 IN (WITH A-FRAME OVERHANG)	10+ KTS	45,000 LBS
BEAM:	DRAFT:	WINCH CAPACITY:
23 FT 11 IN	7 FT 11 IN	EACH DRUM 30,000 LBS LINE PULL AT 50 FT PER MINUTE

CAUSEWAY FERRY, POWER MODULE (CFPM)



CFPM

MISSION

- Self-propelled Module
- Prime mover for causeway ferry
- Capable of assisting assembly, disassembly and tending the RRDF

CHARACTERISTICS

LENGTH:	SPEED:
87 FT 7 IN	10+ KTS
BEAM:	DRAFT:
23 FT 11 IN	7 FT 11 IN

CAUSEWAY FERRY (CF)



CF

MISSION

- The CF is a powered cargo transfer lighterage platform capable of loading, transferring and discharging cargo from ships anchored in-stream to the shore during LOTS operations through SS 3 conditions. The CF moors to the RRDF or FC, Elevated Causeway (ELCAS), or alongside a ship for loading and offloading rolling stock (RO/RO) and lift on/lift off (LO/LO) cargo.
- The CFPM provides propulsion and control of the CF. It joins with the Intermediate Module (IM) via flexor connectors on its bow.

CHARACTERISTICS

LENGTH:	SPEED:
87 FT 7 IN	10+ KTS
BEAM:	DRAFT:
23 FT 11 IN	7 FT 11 IN

ROLL-ON/ROLL-OFF DISCHARGE FACILITY (RRDF)



RRDF

MISSION

- The RRDF is a floating platform that supports the outboard end of the MPF or other RO/RO ship vehicle ramp and serves as a transfer platform for driving vehicles onto lighters that transport the vehicles ashore. The RRDF serves as a vessel-berthing platform for mooring military vessels, transferring personnel, or securing vessels during stand-down periods.

CHARACTERISTICS

LENGTH:	SPEED:
240 FT	NA
BEAM:	DRAFT:
72 FT	2 FT

FLOATING CAUSEWAY (FC)



FC

MISSION

- Provides an interface for cargo, rolling stock, tracked vehicles, and personnel from ship to shore using various types of lighterage. Causeway sections are approx. 90 ft long and the normal length of a floating causeway is 4-12 sections from the beach and provides three discharge points for causeway ferries, LCU 1600 and LCM-8 lighterage.

CHARACTERISTICS

THE FC IS A SUPPLEMENTAL FACILITY THAT ENABLES THE NECESSARY TRANSFER OF MATERIALS WHEN SAND BARS, BEACH GRADIENTS, OR MAN-MADE OBSTACLES PRECLUDE THE NORMAL BEACHING OF LIGHTERS.

THE FC ALSO SERVES AS A BERTHING PIER FOR LIGHTERAGE THAT REQUIRE MINOR REPAIRS OR LONG- TERM (THROUGH A TIDAL CYCLE) ACCESS TO THE BEACH, WHILE ALSO PROVIDING A TWO-WAY DRIVE-ACROSS CAPABILITY FOR ALL ROLLING STOCK AND MAIN BATTLE TANKS (MBTS). ANOTHER ADVANTAGE OF THE FC IS THAT IT ALLOWS THE DISCHARGE OF CARGO, ROLLING STOCK, AND TRACKED VEHICLES FROM LIGHTERS THAT HAVE DEEPER DRAFT AND LIMITED ACCESS TO BEACH OR OTHER PIER FACILITIES.

ELEVATED CAUSEWAY SYSTEM (ELCAS)



ELCAS

MISSION

- The Expeditionary Elevated Causeway is a portable modular structure that can be built out from the beach to a distance of 3,000 feet (914m) and up to a depth of 20 feet to allow small vessels to come alongside and discharge their cargo, mainly containers.

CHARACTERISTICS

THE ELCAS IS AN ELEVATED PIERHEAD AND ROADWAY MADE FROM INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)-COMPATIBLE MODULES ON PILES EXTENDING SEAWARD FROM THE BEACH ACROSS THE SURF ZONE UP TO 3,000 FEET IN LENGTH.

THE ELCAS PROVIDES THE CAPABILITY TO OFFLOAD CONTAINERS FROM LIGHTERS BEYOND THE SURF ZONE.

THE ACTUAL LENGTH IS DETERMINED BY THE REQUIREMENT TO REACH A WATER DEPTH OF 20 FEET AT THE PIERHEAD AND BEYOND THE SURF ZONE. BREAKBULK AND/OR ROLLING STOCK (WITHIN CRANE LIFT CAPACITY) CAN ALSO BE HANDLED BY THE ELCAS FROM LCUS, LCMS, OR CFS. THE ELCAS WAS DESIGNED SPECIFICALLY TO OFF-LOAD CAUSEWAY FERRIES OF BOTH THE ARMY AND NAVY CONFIGURATION TO TRANSFER CONTAINERS OVER THE SURF ZONE AT A RATE OF 370 TWENTY-FOOT EQUIVALENT UNITS (TEUS) PER DAY.

ELCAS IS CAPABLE OF OFF-LOADING THE LARGER ARMY VESSELS (LCU-2000 AND LSV) AT A REDUCED THROUGHPUT RATE AND IN A MORE BENIGN ENVIRONMENT.

MARITIME PREPOSITIONING FORCE UTILITY BOAT (MPFUB)



MPFUB

MISSION


- Transport personnel and material; provide limited force protection; support salvage operations.

CHARACTERISTICS

- THE MPFUB IS DESIGNED TO TRANSPORT UP TO 30 PASSENGERS AND MATERIAL TO A BEACH, SHIP, OR OTHER WATERCRAFT; PERFORM MEDICAL EVACUATION; PROVIDE LIMITED FORCE PROTECTION CAPABILITY AND SUPPORT SALVAGE, DAMAGE CONTROL AND MAINTENANCE/REPAIR OPERATIONS.
- 40 FT X 14 FT HIGH-SPEED LANDING CRAFT.
- LOADED CRUISE SPEED OF AROUND 25 KNOTS AND A LIGHTENED FLANK SPEED OF AROUND 40 KNOTS.
- THE PROPULSION PACKAGE INCLUDES: TWIN CUMMINS QSM11 ENGINES RATED FOR 660HP AT 2300 RPM, ZF 325 MARINE GEARS, AND HAMILTON 364 WATER JETS.
- 6KW NORTHERN LIGHTS GEN-SET WITH SHORE POWER.
- INTEGRATED FURUNO NAVNET ELECTRONICS PACKAGE.
- SHIP BOARD STOWAGE CRADLE.
- THREE WEAPON MOUNTS FOR M2 / MK19 AND M60E3 WEAPONS.

a. Amphibious Bulk Liquid Transfer System (ABLTS)

ABLTS is a hose reel system providing capability to deliver fuel and/or water from ship to shore. Systems are deployed on maritime prepositioning ships squadrons and are normally used in direct support of maritime prepositioning force operations. ABLTS supports Marine Corps amphibious assaults and MPF operations. The system allows for the delivery of fuel and water for the first 30 days until an OPDS or other system is deployed. ABLTS can be installed in 12 hours.

AMPHIBIOUS BULK LIQUID TRANSFER SYSTEM (ABLTS)	
	MISSION <ul style="list-style-type: none">• Self-contained fuel and water system.• Deploys 5,000 feet of 6-inch fuel hose line or 10,000 feet of 4-inch water hose line to a Beach Interface Unit (BIU) – always floats.
CHARACTERISTICS	
<ul style="list-style-type: none">• REQUIRES BPT TO SUPPORT ABLTS BEACH OPERATIONS.• PUMPS APPROXIMATELY 600 GAL/MIN.	

ABLTS

b. Offshore Petroleum Discharge System (OPDS): Currently there are two OPDS configurations: OPDS Legacy (OPDS-L) and the new OPDS contained onboard the USNS K.R. WHEELER.

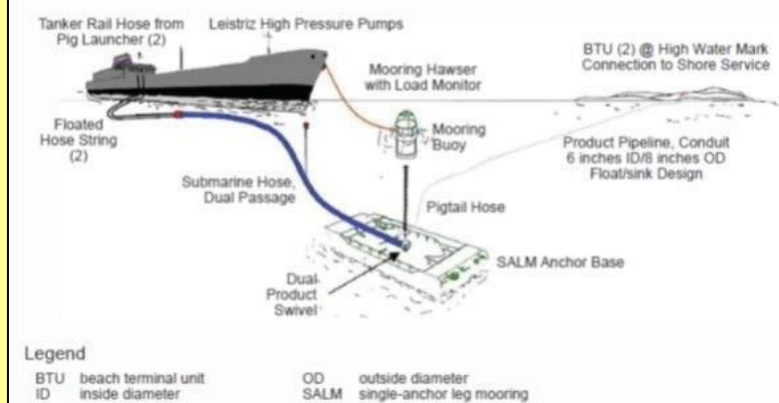
(1) Offshore Petroleum Discharge System Legacy (OPDS-L)

OPDS-L was designed to provide the Joint Force Commander flexibility in an operational area to deliver bulk fuel to operational forces in austere locations. The only OPDS-L vessel, SS PETERSBURG, is a converted special mission commercial cargo tanker capable of delivering cargo fuel directly from tanks aboard the vessel. Deployment, maintenance, and recovery of the single-anchor leg mooring (SALM) and conduit, are the responsibility of the CNBG and subordinate PHIBCBs and underwater construction teams (UCTs). A specially trained PHIBCB OIC coordinates operations between the tanker, various beach group elements, and supported forces ashore that receive the fuel. A temporary spread mooring can be employed in sheltered waters 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 within seven days of tanker arrival. In the event that the 48-hour pumping requirement is waived, all weather pumping through the SPM

may be started four to five days after tanker arrival.

PETROLEUM DISCHARGE SYSTEM (LEGACY) (OPDS-L)

Offshore Petroleum Discharge System – Legacy



OPDS-L

MISSION

- Designed to provide Service components in an operational area with large volumes of refined petroleum products over a sustained period – pumps approximately 1.2 million gallons per 20 hour period
- Carried on board specially designed tankers
- Deployed using five OPDS Utility Boats

CHARACTERISTICS

COMPONENTS: OUR NAUTICAL MILES (24,320 FEET) OF CONDUIT FLOATS WHEN AIR FILLED, AND SINKS WHEN FILLED WITH REFINED PRODUCT OR WATER.

- A SINGLE ANCHOR LEG MOORING (SALM) COMPLETE WITH FLOODABLE BASE, MOORING BUOYS, AND HOSES - SALM PRODUCT SWIVEL PERMITS PUMPING TWO PRODUCTS SIMULTANEOUSLY FROM A TANKER.
- TWO BTUS WHICH ANCHOR THE BEACH END OF THE CONDUIT, CONTROL DOWNSTREAM PRESSURE, AND PURGE THE CONDUITS.

(2) Civilian Crewed Offshore Petroleum Discharge System (OPDS): USNS K. R.WHEELER is a MSC prepositioned force ship capable of transferring bulk cargo from any available tanker source without the need to anchor the vessel to operate; it is designed specifically to address new challenges to bulk fuel provision. Unlike OPDS-L, WHEELER is a terminal ship system capable of transferring bulk cargo from any available tanker source without the need to anchor the vessel to operate. With OPDS, the CNBG, or his designated fuels officer coordinates directly with the ship masters (WHEELER and supply tankers) and the commander, ashore fuel organization. UCTs and

PHIBCBs are not required, and the system is intended to be in place and ready to pump within 48 hours of arrival. Installation of OPDS is significantly less labor and time-intensive than OPDS-L and does not place significant demands upon forces required for other JLOTS operations. The JLOTS commander must be aware of the OPDS operations, and will typically assign a LNO to coordinate with WHEELER. Formal commands to WHEELER must be relayed via the on-scene MSC representative.

OFFSHORE PETROLEUM DISCHARGE SYSTEM (OPDS)



OPDS

MISSION

- Designed to provide bulk fuel off-load to the shore to in support of ground forces
- Carried on board specially designed tanker
- Installs in all bottom types (except exposed tidal mudflats)

CHARACTERISTICS

- PUMPS APPROXIMATELY 1.7 MILLION GALLONS PER 20 HOUR PERIOD UP TO 8 MILES OFFSHORE
- USNS K. R. WHEELER IS A TERMINAL AND FUEL MUST BE DELIVERED VIA SEPARATE TANKER OR BARGE.

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CONTROLLING STATIONS

REFERENCES:

- a) JP 3-02, Amphibious Operations
- b) NTTP 3-02.14, The Naval Beach Group
- c) NTTP 3-02.1M/MCWP 3-31.5, Ship-to-Shore Movement
- d) CNSL CNSP 3340.3, Wet Well Operations Manual

1. Introduction. Wet well operations may take place pier side, at anchor, or underway. Well deck ballasting and de-ballasting and craft launching and retrieval operations require a high degree of coordination and precision, leaving little room for personnel error or equipment failure.

2. Controlling Stations During Condition 1A

- a. Debark Control Officer (DCO). The DCO is responsible for the safe and effective coordination between the Bridge, Combat Information Center, and Well Deck Control during the execution of amphibious operations, and for any other duties prescribed by the Commanding Officer. The DCO, when authorized by the Commanding Officer, will direct the employment of assigned boats and landing craft and direct the Officer of the Deck to maneuver as required to ensure the safe launch and recovery of those units.

Note: The XO should **not be** specifically assigned as the Debark Officer. The Debark Officer must be a SWO qualified officer that has completed the required Job Qualification Requirements (JQR) and designated in writing.

- b. Well Deck Control Officer (WDCO). WDCO supervises all well deck operations. The WDCO is responsible for the safe handling, embarkation and debarkation of all boats and vehicles in the well deck. The WDCO reports directly to the Debark Control Officer.
- c. Ballasting Officer (BO). BO normally the Damage Control Assistant (DCA), is stationed in ballast control. The Ballasting Officer supervises the actual ballasting/deballasting operation and provides the wet well conditions as specified by the Well Deck Control Officer in the pre-ballast brief.
- d. Officer of the Deck (OOD). The OOD will obtain permission from the Commanding Officer to commence ballasting operations.
 - (1) The OOD must keep all stations aware of the ship's maneuvers or evolutions which could affect ballasting operations and embarkation/debarkation of the vehicles and craft.
 - (2) Use bridge and/or aft lookout when underway or post topside lookout(s) in best position to observe any fuel or other hazardous material. Ensure lookout(s) are in direct communication with Ballasting Officer.
- e. Combat Cargo Officer (CCO). If assigned, is responsible for the planning and movement of cargo and vehicles for embarkation or onload.

3. List of Required Station Assignments

a. Ballast Control

- (1) Ballasting Officer
- (2) Ballast Console Operator
- (3) Phone Talker
- (4) Log Keeper

b. Bridge

- (1) Officer of the Deck
- (2) Phone Talker Qualified

c. Compressor Room

- (1) Operator
- (2) Phone Talker (may be Operator)

d. Debark Control

- (1) Debark Control Officer
- (2) Phone Talker Qualified
- (3) Log Keeper
- (4) Messenger

e. Damage Control Central

- (1) DCC Watch
- (2) Phone Talker
- (3) Sounding and Security

f. Sea Ballast Control Stations

- (1) Operator
- (2) Phone Talker Qualified (may be Operator)

g. Stern Gate

- (1) Operator
- (2) Phone Talker (may be Operator)

h. Well Deck Control

- (1) Well Deck Control Officer
- (2) Well Deck Safety Officer
- (3) Petty Officer in Charge/Ramp Marshall
- (4) Line Petty Officer
- (5) Line Handlers (minimum of 2 per line)
- (6) Phone Talker

See CNSL CNSP 3340.3 Wet Well Operations Manual

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LANDING CRAFT OPERATIONS

REFERENCES:

- a) JP 3-02, Amphibious Operations
 - b) NTTP 3-02.14, The Naval Beach Group
 - c) NTTP 3-02.1M/MCWP 3-31.5, Ship-to-Shore Movement
 - d) CNSL CNSP 3340.3, Wet Well Operations Manual
1. LCM Operations. LCMs may be embarked individually or married in pairs. Craft will be called in by signal flag or by light as appropriate.
 2. LCU Operations. LCU can only be embarked individually. The depth of water in the well deck should take into account the maximum draft of the LCU to ensure there is adequate water beneath the keel to prevent damage to the craft, 18 inches beneath the keel is normally considered sufficient. When multiple craft are being operated together outside the well, those not embarking or debarking will stand off at greater than 500 yards to avoid impeding the maneuvers of the ship or the craft operating in the well.
 3. Launch Procedures. Although well deck launch of craft is normally accomplished at anchor or while at bare steerage way, there is a significant tactical advantage to conducting underway launch of these craft at speeds in excess of 10 knots. The procedures for underway launch of craft are identical to those for static launch. Of the greatest importance is maintaining a steady course until craft are clear of the well and safe to maneuver on their own.
 4. Launch Speed. The major limitations to launch speed are safe navigation, craft limitations, and sea conditions. **The maximum allowable speed for launching LCU is 12 knots and 16 knots for LCM, at a maximum sea state of 4.** A launch speed of over 8 knots for LCU and 10 knots for LCM requires a highly trained crew and operational necessity.

CRAFT LANDING ZONES/SITES

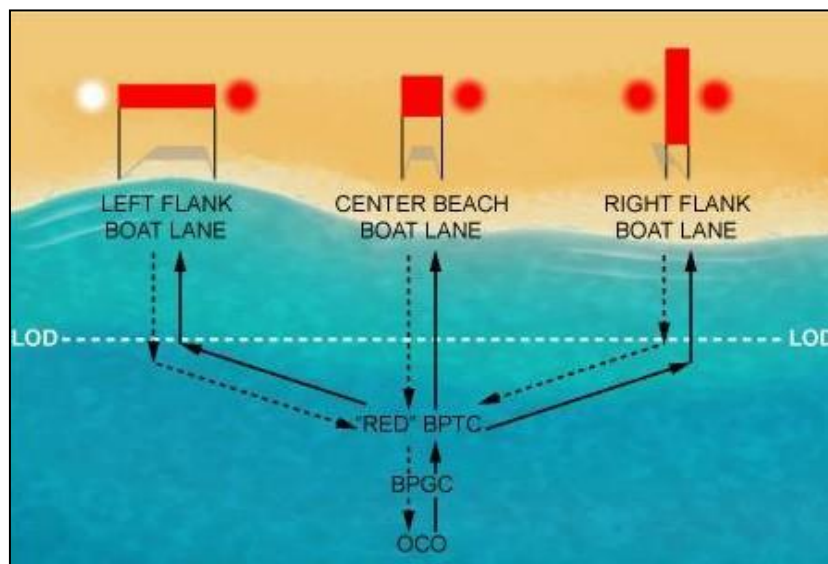


Figure 1.1

1. Notional LCU Pre-Boat Load Plan for BPT Equipment

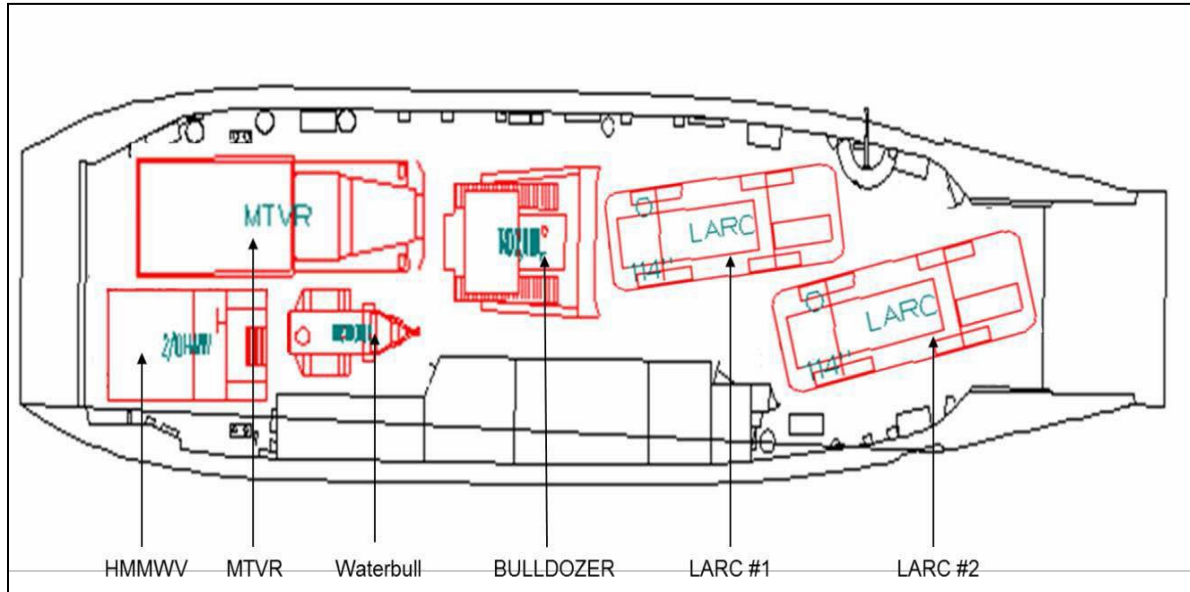


Figure 1.2
Notional LCU Pre-Boat Load Plan Option #1

***LOAD PLANS MISSION DEPENDENT, OTHER STANDARD CONFIGURATION: LARC, DOZER, LARC, WATERBULL, MTVR, HMMWV**

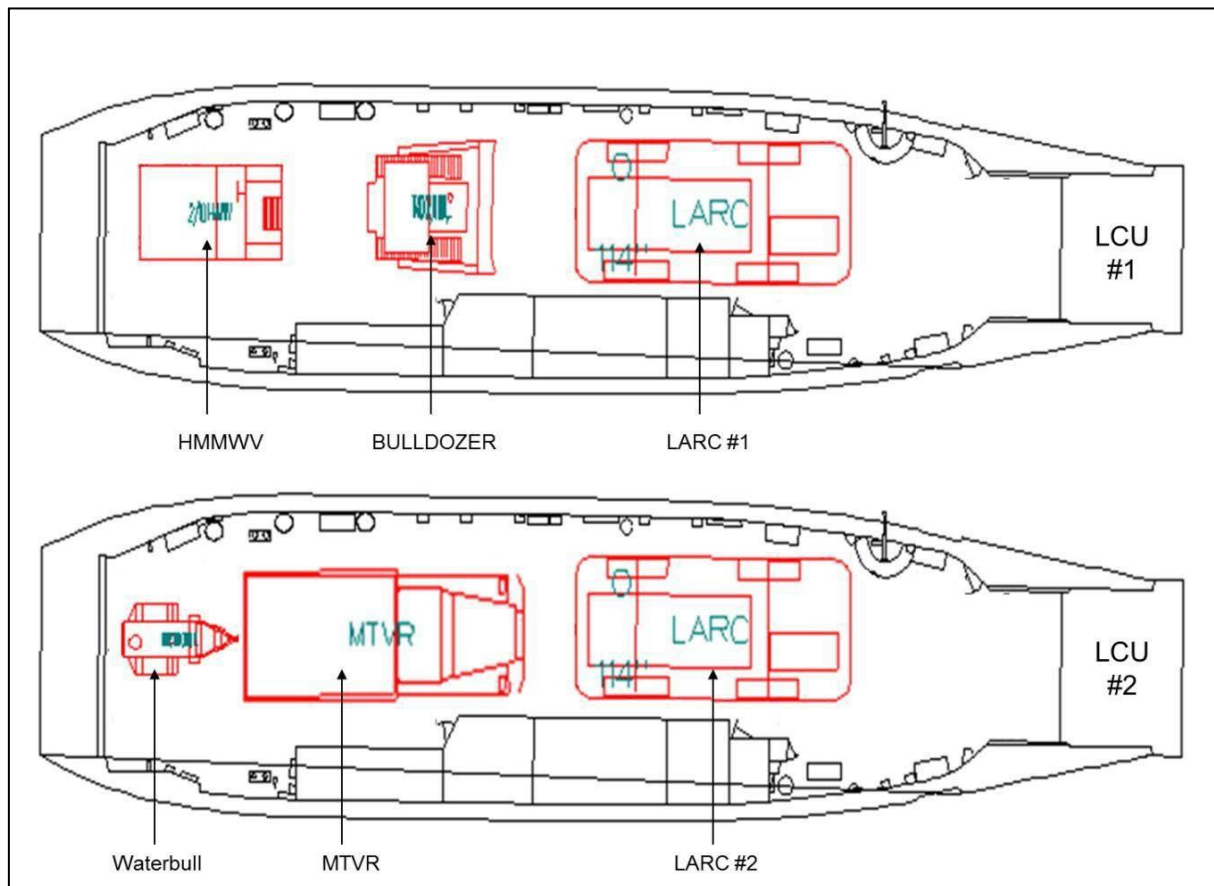


Figure 1.3
Notional LCU Pre-Boat Load Plan Option #2 (Using two LCUs)

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LIGHTER, AMPHIBIOUS RE-SUPPLY, CARGO 5 TON (LARC-V) OPERATIONS

REFERENCES:

- a) JP 3-02, Amphibious Operations
- b) NTTP 3-02.14, The Naval Beach Group
- c) NTTP 3-02.1M/MCWP 3-31.5, Ship-to-Shore Movement
- d) CNSL CNSP 3340.3, Wet Well Operations Manual

1. LARC-V Capabilities. The LARC-V can be used for various functions and specific operations. The following is a list of specific LARC-V operations.

- a. Carrier of light cargo.
- b. Transport passengers outside the surf line to a waiting craft.
- c. Dewatering/firefighting capability of swamped/burning craft (up to 100 GPM provided by the P-100 pump).
- d. Raising inoperable LCM-8 ramps.
- e. Towing disabled vehicles.
- f. Transferring towline to and from the salvage boat.
- g. Conduct operational surveys of landing zones for conventional craft operations.

Go/No Go Criteria

Table provides information on go/no go criteria to help decision makers plan a course of action when the LARC-Vs are used during open ocean operations. As a quantitative value for open ocean launches and transits, this information should be as closely adhered to as possible, keeping prudent seamanship skills in mind.

LARC-V Go/No Criteria

EVOLUTION	GO/NO GO CRITERIA
Ocean Current	No go if ship to shore movement greater than 4 miles; should not be attempted at night or in conditions of low visibility, or when current is greater than 4 knots
Swell Height	No go if swell heights greater than 6 feet or any combination of chop and swell heights greater than 6 feet
Chop Height	No go if chop height greater than 4 feet regardless of swell height
Wind Speed	No go if wind speed greater than 25 knots regardless of wave height
Beach Gradient	N/A
MSI	Wartime - No go if MSI exceeds 9 Training - No go if MSI exceeds 6
NOTE: LARC-V's transit in pairs or with a lifeboat (of equal or greater towing strength if feasible) if only a single LARC-V is used/required	

Table 2.1

LARC-V Wet Well Operations

The LARC-V is capable of operating from a wet well but extreme care must be taken to prevent bumping by other craft. The LARC-V has limited watertight integrity and is subject to severe hull damage and flooding if not properly controlled in the well. Wave action and improper line handling while moving craft in the well; can result in significant damage to the LARC-V. The loss of one LARC-V seriously degrades the salvage capability of the BMU.

Embark and Debark of LARC-V

During embarkation, LARC-Vs can be brought into a wet well of 4 feet of water at the sill, depending on sea conditions and, providing there are no other craft alive in the well. With the stern gate lowered to the stops, the LARC-V is less susceptible to damage.

During debark of the LARC-Vs, the well should **not have more than 4 feet of water** at the sill and the stern gate lowered to the stops. This allows the LARC-Vs to remain in land drive down the well deck and launch as it crosses the sill. The LARC-Vs should be launched individually.

During embark or debark of LARC-Vs, steadying lines should be used only in extreme sea states and at the discretion of the Well Deck Control Officer. Although the LARC-Vs are amphibious, they should be treated as boats during well deck operations.

Underway Launch

The underway launch of LARC-Vs is extremely dangerous and not recommended. Although amphibious, the LARC-Vs are not designed to enter the water at ship speeds in excess of 5 knots. LARC-Vs have limited watertight integrity and cannot be subjected to submersion as AAV (LTP-7). If an underway launch is absolutely necessary, avoid ship speeds exceeding 4 knots. The wash of the ship's propeller at greater speeds will cause the LARC-Vs to submerge after clearing the sill and sink. Whenever possible, launch and recovery of LARC-Vs should be accomplished while the ship is at anchor.

2. Notional Causeway Ferry Pre-Boat Load Plan for BPT Equipment

All BPT equipment can be loaded onto one causeway ferry for ship-to-shore and shore-to-ship movement.

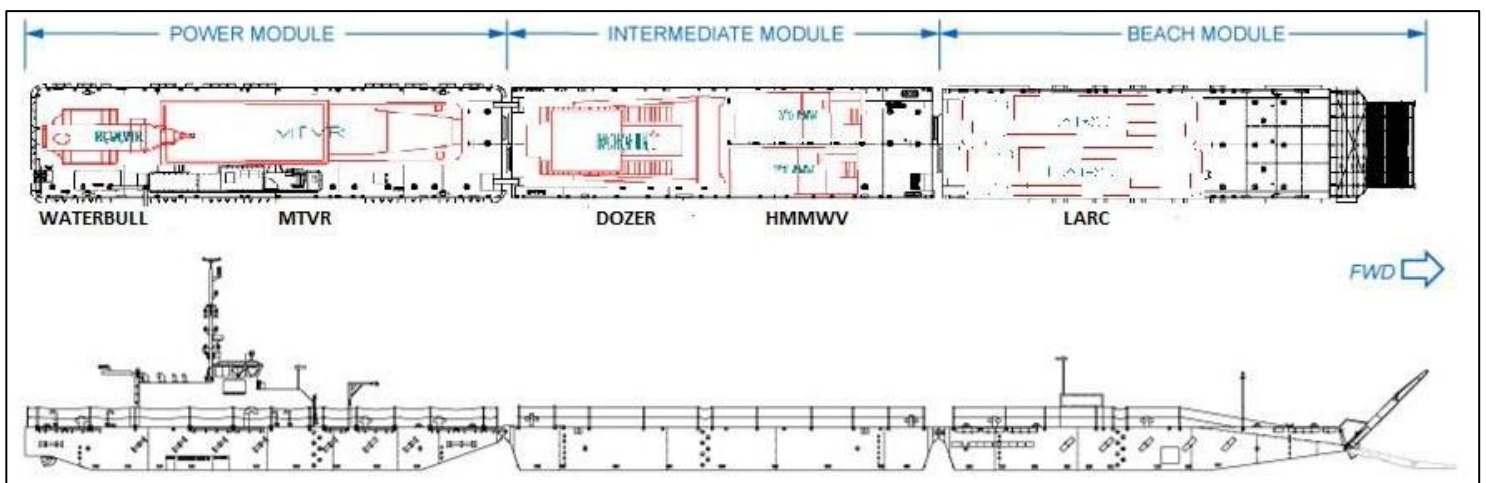


Figure 2.1

Notional Beach Layout for Two Boat Lanes

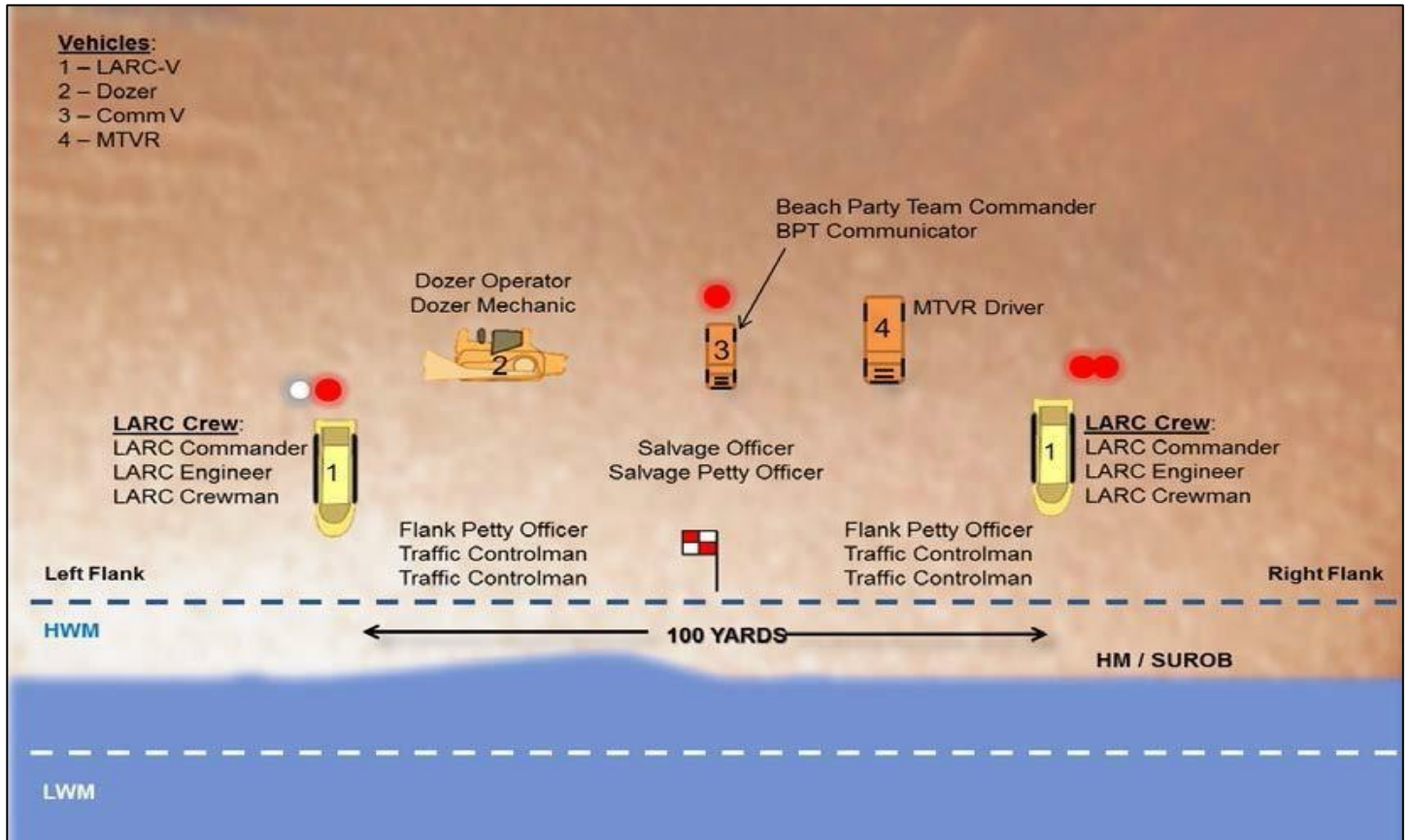


Figure 2.2

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LANDING CRAFT AIR CUSHION (LCAC) OPERATIONS

REFERENCES:

- a) JP 3-02, Amphibious Operations
- b) NTTP 3-02.14, The Naval Beach Group
- c) NTTP 3-02.1M/MCWP 3-31.5, Ship-to-Shore Movement
- d) CNSL CNSP 3340.3, Wet Well Operations Manual

1. Introduction. LCAC control areas are established in the landing area to de-conflict tactical operations, define transit lanes/routes for LCAC waves, and identify geographic positions for timing of the LCAC ship-to-shore movement.

CLZ Beach Markers

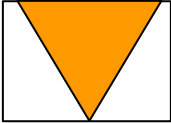
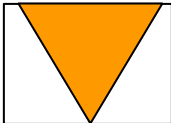
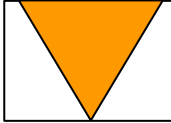



	Left Flank	Center	Right Flank
Day Marking – three Center Flag Marks	6' 	 	6' 
Night Marking (Preferred) 3 Strobe Lights, orange (or infrared) placed 3' apart and	 	  3-Orange strobe lights	 

Table 3.1

Beach Markings

NWP 3-02.12/MCRP 3-31.1A and NTTP 3-02.1/MCWP-3-31.5 provide baseline tactics and guidelines to be used by planners in determining the start point for amphibious operations involving LCACs and the BMU in support of these operations. OPNAVINST 3120.42(series) and SEAOPS Volumes I through VIII, provides standardized procedures and is the authoritative documents for all LCAC operations. If the LCAC Craft Landing Zone (CLZ) is located inland of the high water mark (HWM), the area of responsibility (AOR) assigned to the BMU is extended to include the LCAC transit lane from the craft penetration point (CPP) to the inland side of the CLZ.



Figure 3.1
LCAC Craft Landing Sites

A CLZ should be of sufficient size to accommodate the number of LCACs to be offloaded simultaneously. The same terrain features that affect route selection also affect CLZ selection. CLF selects CLZs with CATF's concurrence. CLZs will be named for the beach on which they are located; for example, CLZ Blue would be the CLZ on Blue Beach. If more than one CLZ is located on a colored beach then each CLZ will also receive a numerical designation such as CLZ Blue One.

Beach Numbering

All beaches are numbered in sequence from right flank to left flank.

LCAC NO-GO Criteria

The following are NO-GO criteria for operating with an LCAC:

- Loss of ALL communications
- Visibility less than 2000 yards
- No visibility of CLZ markers by Craftmaster
- Fouled LCAC approach lane or CLZ
- Winds greater than 30 knots
- Unmovable FOD
- Significant Breaker Height greater than 6.9 feet
- Maximum breaker height greater than 8 feet
- Craftmaster and/or SRM direction

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CRAFT LIMITATIONS

REFERENCES:

- a) BMU-HNDBK-5400.1, Beachmaster Handbook
- b) NTTP 3-02.14, The Naval Beach Group
- c) NTTP 3-02.1M/MCWP 3-31.5, Ship-to-Shore Movement
- d) CNSL CNSP 3340.3, Wet Well Operations Manual

1. **Modified Surf Index (MSI).** The MSI is a dimensionless number that 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 landing operations for each type of landing craft, except for LCAC, Rigid Raiding Craft (RRC), and Combat Rubber Raiding Craft (CRRC) (these craft do not depend on the surf conditions reported in this way).

The Modified Surf Limit assigned to amphibious vehicles and landing craft is the maximum that should be attempted for routine operations. If the MSI exceeds the Modified Surf Limit for 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. Table 4.1 identifies the maximum MSI for the listed craft.

Craft MSI Limitations

CRAFT	TRAINING/ OPERATIONS MSI	WARTIME MSI
LARC-V/OUB/LCM-8	6	9
LCU	6	12
INLS CF, WT	6	8
MPFUB	3	3
AAV	6	6

Table 4.1

LCAC Surf Information. The MSI is not applicable to the LCAC since it is a non-displacement craft. The limiting conditions for operating the LCAC in the surf zone (Table 4.2) are found in SEAOPS and based on load size and significant breaker height only:

LCAC Surf Limitations

LOAD	SIGNIFICANT BREAKER HEIGHT
75 tons (overload)	0-4 feet
60 tons (normal)	4-8 feet
45 tons (reduced)	8-12 feet

Table 4.2

Raiding Craft Surf Limitations. The MSI is not used for judging the feasibility of conducting CRRC or RRC operations. Raiding Craft operations should only be conducted in relatively benign surf conditions, where the significant wave height is one foot or less.

Sea State Chart

Beaufort wind scale	Wind speed		Weather bureau terms	Observed effects	Sea description	Wave heights, Douglas sea-state	
	knots	km/hr				ft	
0	<1	<1	Calm	Sea like a mirror	Calm	0	0
1	1-3	1-5	Light	Ripples; smoke drifts	Smooth	<1	1
2	4-6	6-11	Light breeze	Small wavelets; breeze felt	Slight	1-3	2
3	7-10	12-19	Gentle	Waves begin to break; leaves in constant motion	Moderate	3-5	3
4	11-16	20-28	Moderate	Numerous whitecaps; dust and leaves blow	Rough	5-8	4
5	17-21	29-38	Fresh	Some spray; small trees sway			
6	22-27	39-49	Strong wind	Large waves; white foam crests; Large branches in motion			
7	28-33	50-61	Stiff wind	White foam blown downwind	Very rough	8-12	5
8	34-40	62-74	Stormy wind	Small branches broken			
9	41-47	75-88	Strong gale	Slight structural damage	High	12-20	6
10	48-55	89-102	Whole gale		Very high	20-40	7
11	56-63	103-117	Storm		Mountainous	40	8
12	>64	>118	Hurricane		Confused		9

Table 4.3

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MARITIME PREPOSITIONING FORCE (MPF) OVERVIEW

REFERENCES:

- a) MCWP 3-32/NTTP 3-02.3M, Maritime Prepositioning Force (MPF) Operations
- b) JP 4-0, Joint Logistics
- c) JP 1-02, DoD Dictionary of Military and Associated Terms

1. Introduction. The primary purpose of the MPF program is to enable the rapid deployment and engagement of a fully capable Marine Air-Ground Task Force (MAGTF) anywhere in the world in support of our National Defense Strategy. This strategic capability combines the capacity and endurance of sealift with the speed of airlift.

a. Preposition. To place military units, equipment, or supplies at or near the point of planned use or a designated location to reduce reaction time, and to ensure timely support of a specific force during initial phases of an operation.

b. Composition. The Maritime Prepositioning Force is a task organization that consists of three elements.

- (1) Marine Air-Ground Task Force.
- (2) Navy Support Element (NSE).
- (3) Maritime Prepositioned Ship Squadrons (MPSRON).



Figure 5.1

2. MPF Concept. A portion of an MPF Marine Expeditionary Brigade (MEB's) and Navy Support Element's (NSE's) equipment list (E/L) is pre-loaded on regionally sited MPF ships (MPS).

a. The Fly-in-Echelon (FIE), which consist of MPF, MAGTF, and Navy Support Element (NSE) personnel and any equipment that is needed for the mission but not loaded on the MPS, will deploy to the area of operation by using available organic or strategic airlift.

b. The Flight-Ferry (FF), which may consist of both fixed-wing and tilt-rotor aircraft, will

self-deploy to the area of operations.

c. The force rendezvous with the equipment and supplies from the MPS in the Arrival and Assembly Area, and begins standing up for employment. All classes of supply, except classes II, VI (personal demand items) and X (nonmilitary programs) are pre-loaded on the MPS to support the force for up to 30 days of sustained operations.

3. Background

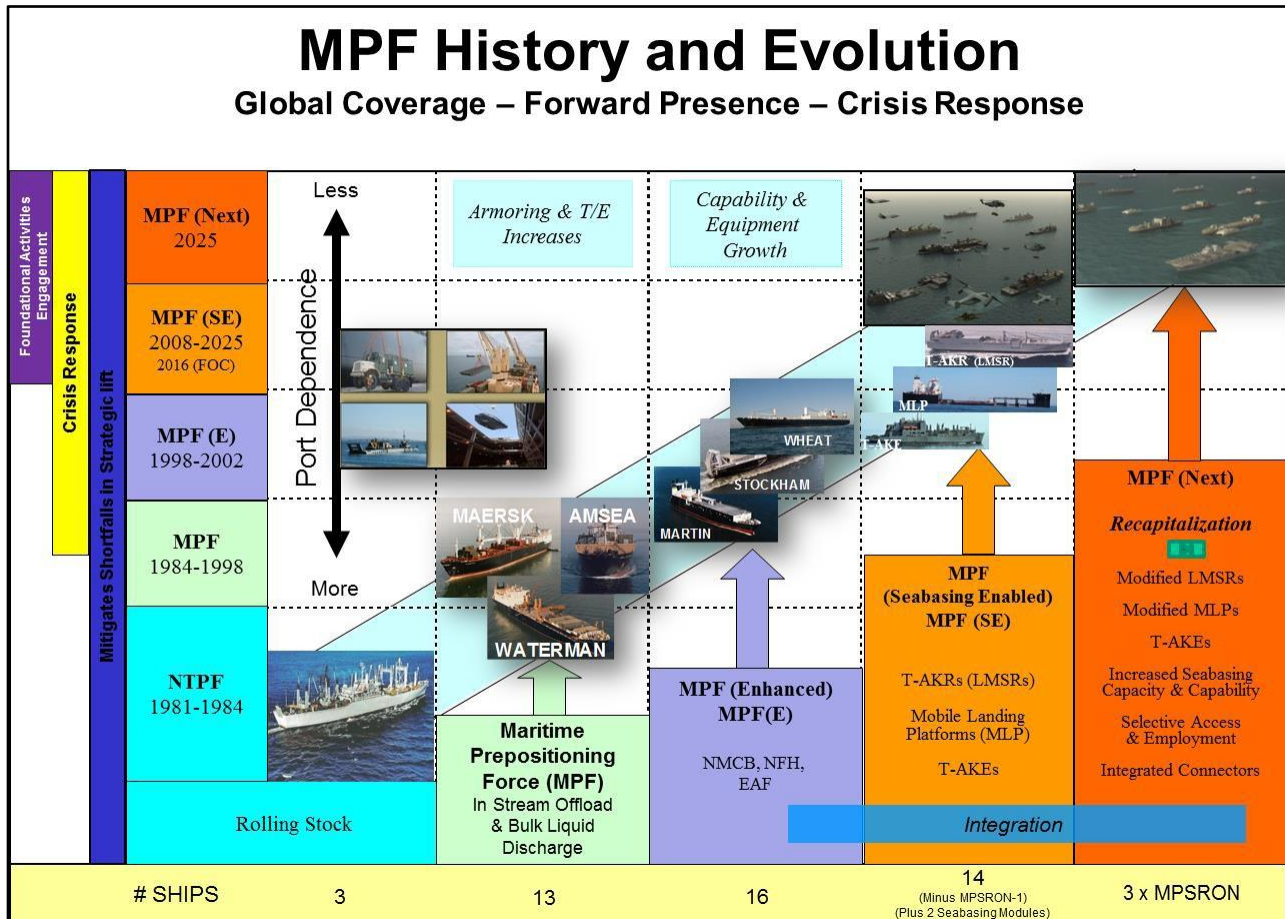


Figure 5.2

Marine Corps Prepositioning. Marine Corps prepositioning consists of both afloat and ashore prepositioning programs.

Afloat Prepositioning. The MPF remains a key component of our Nation’s overall global prepositioning posture. The MPF consist of two Maritime Prepositioning Ship Squadrons (MPSRON), each with seven ships. Each MPSRON is prepositioned with the majority of the supplies and equipment needed to support a Marine Expeditionary Brigade (MEB) for 30 days. The MPSRONs are strategically staged to provide overlapping coverage and ensure at least one MPSRON can arrive at a desired location within seven days of notification.

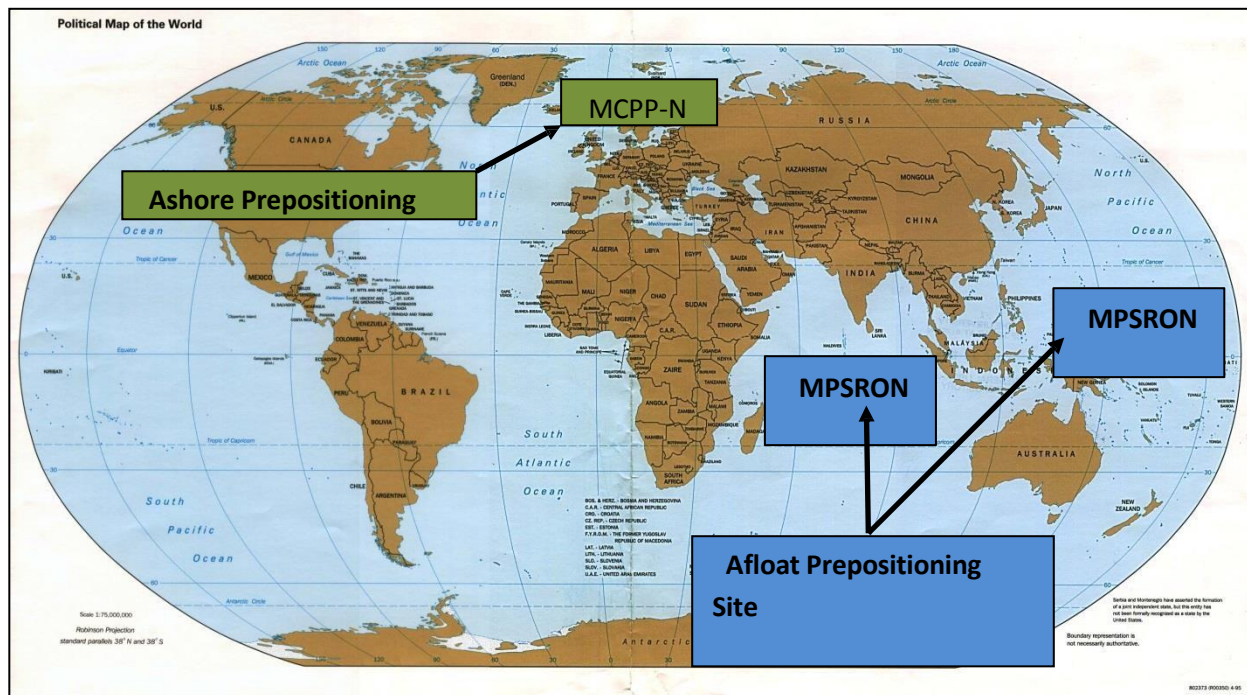


Figure 5.3

MPF Characteristics. The MPF provides a strategic deployment asset available to combatant commanders, using the prepositioned ships which are pre-loaded with USMC/USN equipment and supplies.

- a. **Rapid Response.** Significantly faster response than equivalent amphibious and sealift options. Time is significantly reduced since the equipment is already loaded and forward projected.
- b. **Enabling Force.** Rapid buildup of combat power ashore without impacting previously deployed forces, or without the assistance of other forces.
- c. **Global in Nature.** Two squadrons, each capable of supporting a Marine Expeditionary Brigade (MEB), are forward deployed in strategically advantageous locations.
- d. **Naval in Character.** Power projection from the sea in an acceptably permissive environment.
- e. **Self-Sustaining.** Provides thirty days of supply.
- f. **Tailored Response.** Provides a scalable response across the Range of Military Operations (ROMO) by employing part or all of an MPF force that allows for tailored response to a specific situation.
- g. **Interoperable.** The ability of any force to conduct MPF operations with any ship(s) from either MPSRON. Interoperability is achieved through commonality in MPF operational and logistics planning, ship load plans documentation, and training.

MPF Organization

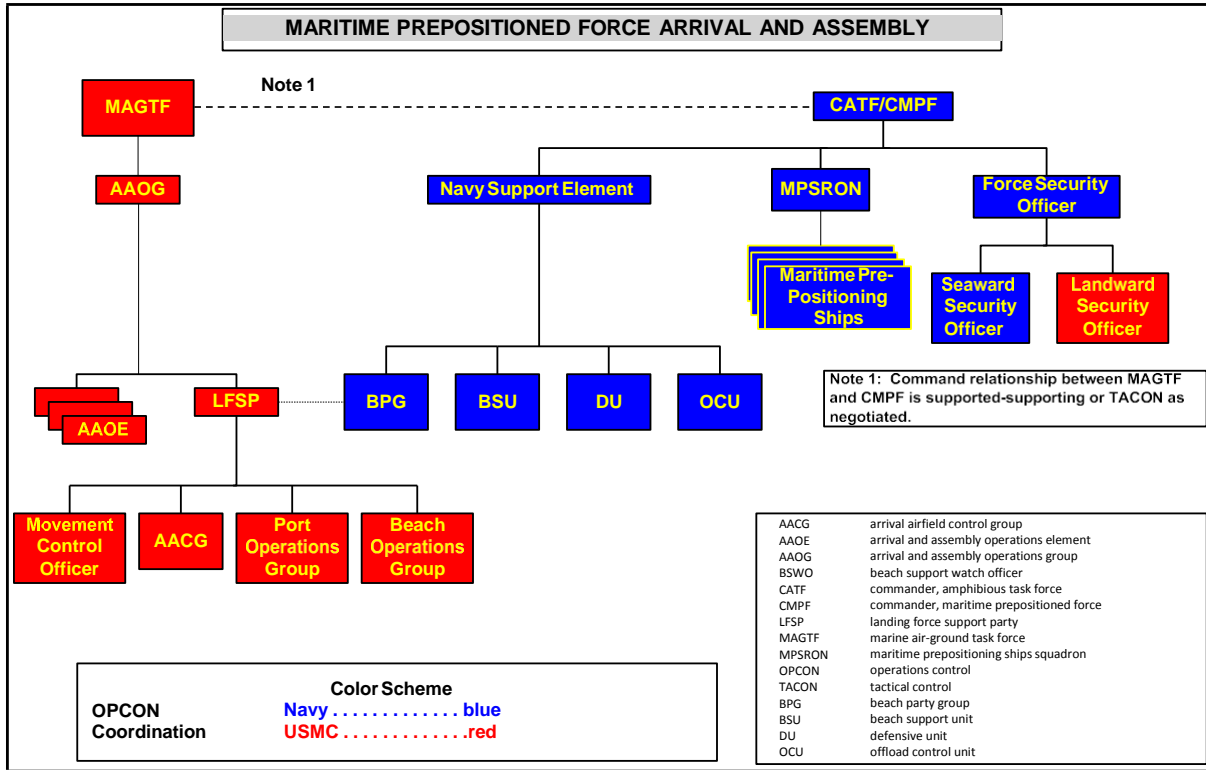
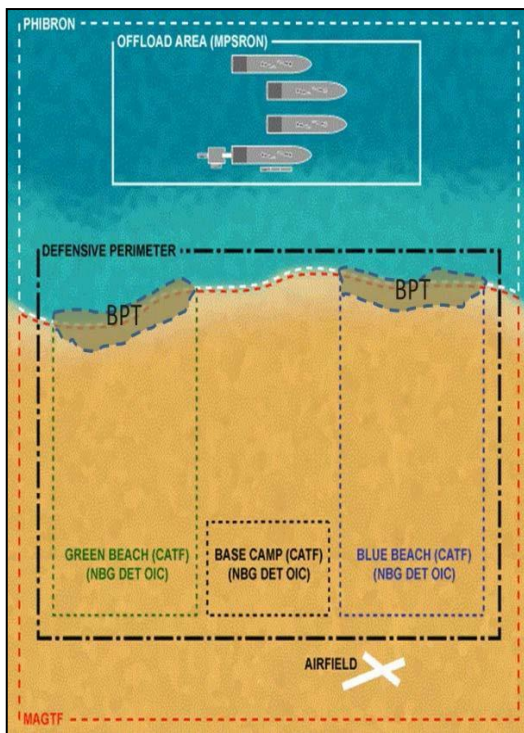


Figure 5.4



Amphibious AOR

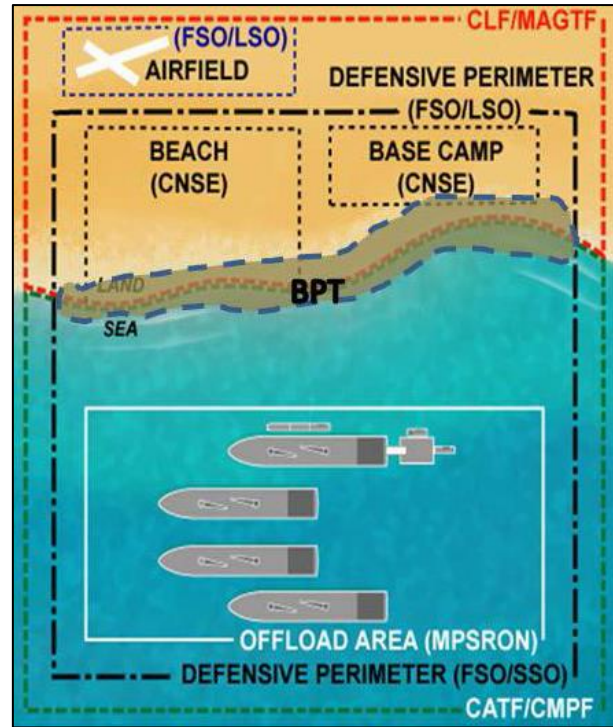


Figure 5.5

MPF AOR

MPF Roles and Missions. The following are major roles/missions envisioned for MPF:

- a. Reinforcement of an ally prior to hostilities
- b. Support or reinforce an amphibious operation;
- c. Occupy or reinforce an advanced naval base
- d. Establish a sizable force ashore in support of sustained operations ashore
- e. Create a show of force or shaping operations
- f. Provide rapid peacetime response in support of humanitarian assistance and disaster relief
- g. Provide economy of force through reduction of strategic airlift requirements and reduction of, or obviation of the need to employ amphibious forces.

Considerations for MPF Employment

- a. Adequate strategic airlift
- b. Adequate throughput support (i.e. nodes, equipment, and personnel)
- c. Pier side or instream offload
- d. Secure environment
- e. MPF Limitations
 - (1) No forcible entry capability
 - (2) Environmental factors, such as climate, sea state, terrain
 - (3) Limited shipboard space for other non-MPF activities, such as security personnel
 - (4) Limited shipboard command, control, communications, computers and intelligence (C4I) capability
 - (5) Connectors
 - (6) Ship security

Phases of an MPF Operation

- a. Planning Phase. MPF planning methods are deliberate, crisis action, and time sensitive for both contingency and execution planning efforts. The Planning Phase officially begins upon receipt of the Warning Order or Initiating Directive and is continuous through completion of the operations.
- b. Marshalling Phase. During the Marshalling Phase, units complete final preparation for movement to aerial ports of embarkation (APOEs) and loading aboard aircraft. It begins with the arrival of the first element at the designated marshalling point and ends upon departure of the last element from a departure airfield.
- c. Movement Phase. The Movement Phase begins upon lift-off of the first aircraft from the departure airfield or when the MPSRON begins transit to the Arrival and Assembly Area (AAA). This phase ends when the last fly-in echelon (FIE) aircraft arrives in the AAA or the last MPSRON ship has arrived at the off-load point. There are two major movement groups.
 - (1) Air Movement Group. Arrives into the AAA by air.
 - (2) Sea Movement Group. Arrives into the AAA by sea.

d. Arrival and Assembly Phase. Arrival and Assembly Phase is the most crucial phase of an MPF operation. The Arrival and Assembly Phase begins with the arrival of the first MPSRON ship or the first aircraft of the Main Body at the AAA. This phase ends when adequate equipment and supplies have been off-loaded and issued to awaiting units; command and control communications have been established; and the MPF MAGTF commander reports that all essential elements of the MAGTF have attained combat readiness. Simultaneous or subsequent tactical operations by the MPF MAGTF and movements to those operations are not considered part of the MPF operation.

e. Reconstitution Phase. The MPF Reconstitution Phase is the methodical approach to restore the MPSRON to its original strength or properties and to attain full operational capability. This process may involve restructuring the types and quantities of equipment and supplies carried on individual MPSs, but the end result is a fully operational capability. The goal is to reestablish a capability to deploy three MPSRONs with desired expeditionary capabilities to support approved force modules as rapidly as possible. Reconstitution is different in purpose and scope, and should not be confused with redeployment.

THE FIVE PHASES OF MPF OPERATIONS

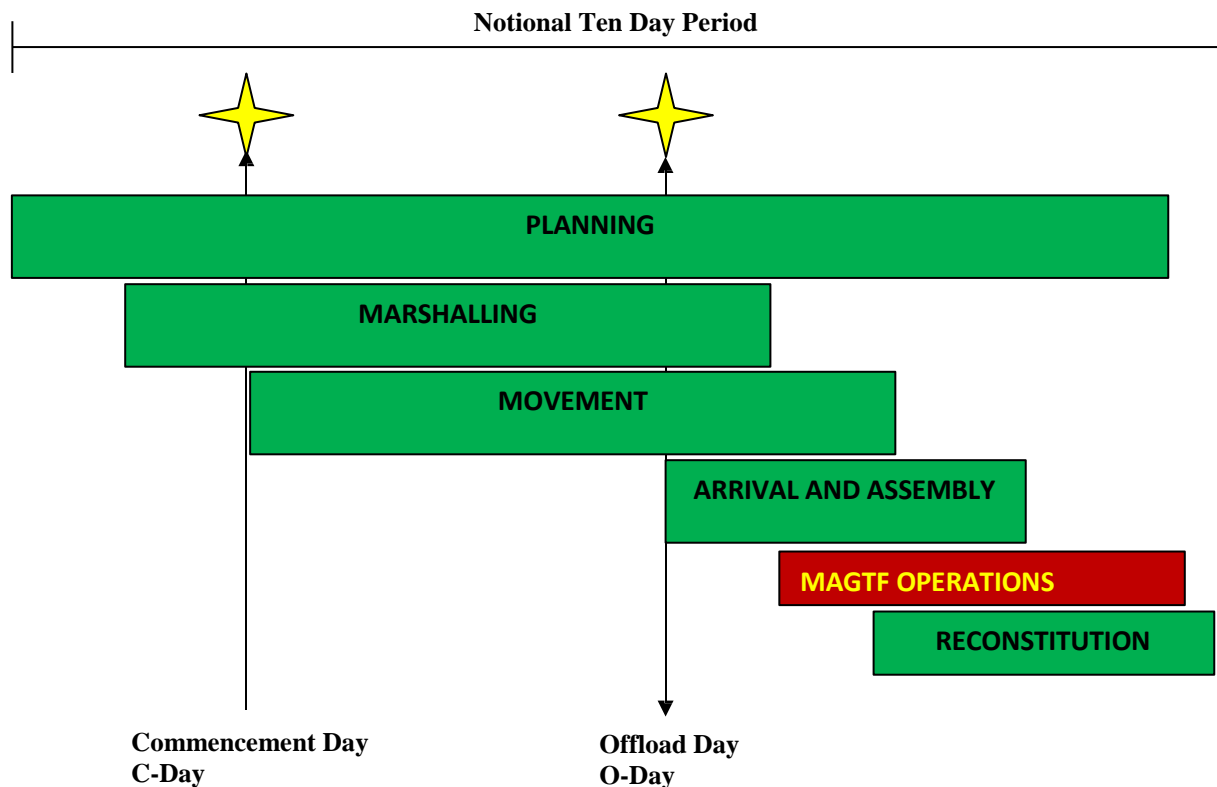


Figure 5.6

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OFFSHORE BULK FUEL SYSTEM OVERVIEW

REFERENCES:

- a) JP 3-02, Amphibious Operations
- b) NTTP 3-02.14, The Naval Beach Group
- c) NTTP 3-02.1M/MCWP 3-31.5, Ship-to-Shore Movement
- d) CNSL CNSP 3340.3, Wet Well Operations Manual

1. OFFSHORE BULK FUEL SYSTEMS (OBFS). The two OBFS systems used for transferring fuel from points offshore to reception areas on the beach are the Amphibious Bulk Liquid Transfer System (ABLTS) and the Offshore Petroleum Discharge System (OPDS). The OBFS provides bulk fuel and water via systems that are deployed from ships offshore to beach areas. Elements of the OBFS systems are normally deployed by the use of Offshore Petroleum Discharge System (OPDS) Utility Boats (OUBs) for OPDS and by use of WT, CFPM and non-powered modules for the ABLTS.

A BPT is required to support fuel/water operations at the beach for both of these systems. The Navy component has the responsibility for installation of the bulk fuel/water systems to the OPDS beach terminal unit (BTU) or ABLTS beach interface unit (BIU).

2. Amphibious Bulk Liquid Transfer Systems (ABLTS). Initial means of transferring liquid cargo ashore from up to 10,000 feet offshore



Figure 6.1
Amphibious Bulk Liquid Transfer System (ABLTS)

3. Offshore Petroleum Discharge System (OPDS). The OPDS is capable of transferring a single liquid from up to 8 miles offshore.



Figure 6.2
Offshore Petroleum Discharge System (OPDS)

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MARINE AIR-GROUND TASK FORCE (MAGTF) OVERVIEW

REFERENCES:

- a) JP 3-02, Amphibious Operations
- b) MCO 3120.13 - Policy

1. Introduction. In 1983, the Secretary of Defense directed each military service and defense agency to review their existing special operations capabilities and develop a plan for achieving the level of special operations capability required to combat both current and future low intensity conflicts and terrorist threats. In response, the Marine Corps instituted an aggressive training program to optimize the inherent capability of MEU'S to conduct selected maritime special operations, and labeled the organization MEU (SOC). In 2006, with the standup of Marine Special Operations Command, SOC was deleted from the normal nomenclature for a MEU, unless specifically deploying with attached or supporting special operations forces (SOF). In 2015, **the term SOC was deleted from the MEU lexicon regardless of whether SOF is assigned to or accompanying the MEU.** The forward deployed MEU is uniquely organized and equipped to provide the naval or joint force commander with rapidly deployable, sea-based capability with 15 days of sustainment, optimized for forward presence, amphibious operations, crisis response and limited contingency operations. The MEU may also serve as an enabling force for follow-on MAGTF'S and SOF (or joint/combined forces) in the event the situation or mission requires additional capabilities and resources.

The Marine Air-Ground Task Force (MAGTF) is the Marine Corps primary tactical organization for all missions across the range of military operations. The MAGTF provides operational commanders with an expeditionary force for responding to a broad range of crisis and conflict situations.

2. Organization

Landing Force (LF). A LF is defined as a Marine Corps or Army task organization, or combination, formed to conduct amphibious operations. When Marine Corps forces are employed as the LF, they will be task-organized into a MAGTF.

Landing Force Support Party (LFSP). The LFSP is a temporary task-organized unit composed of elements from the Logistics Combat Element and augmented by other MAGTF elements. The LFSP is under operational control (OPCON) of the Arrival Assembly Operations Group (AAOG) and is established by a formal activation order by the CLF. The LFSP performs the following:

- Facilitates landing and movement of troops, equipment, supplies across beaches and into landing zones (LZs), ports, and airfields.
- Establishes the NBG, Landing Force's logistics combat element (LCE), air combat element (ACE), and ground combat element (GCE) ashore.
- Provides assistance in beaching, retracting, and salvaging of landing craft and amphibious vehicles.
- Establishes an emergency medical capability and medical evacuation support. Evacuates casualties and enemy prisoners of war (EPW) from beaches and LZ.
- Controls the operations of the Port Operations Group, Beach Operations Group Arrival/Departure Airfield Control Group and Movement Control Center.
- Provides limited maintenance.
- Coordinates with other participating agencies: Port Authority, Host Nation (HN), Tanker Airlift Control Element (TALCE), etc.

Marine Forces. There are four Marine Corps forces that provide manpower, equipment and supplies for Marine Corps operations. These forces can be task organized into MAGTF'S of any size or composition, and tailored to accomplish any mission.

Marine Forces Command (MARFORCOM). – Provides Marines and equipment to the deploying Marine Force in the Atlantic, Europe, and Africa.

Marine Forces Pacific (MARFORPAC). – Provides Marines and equipment to the deploying Marine Force in the Pacific.

Marine Forces Headquarters. – Provides the administrative infrastructure and control for MARFORCOM and MARFORPAC.

Marine Forces Reserves (MARRES). – Provides trained and qualified units and personnel for active duty in time of war, national emergency, and at such times as the national security may require.

a. Marine Air-Ground Task Force (MAGTF). The MAGTF ranges in size from the smallest (which can number from fewer than 100 to 3,000 Marines) to the largest (which can number from 40,000 to 100,000 Marines).

- Marine Expeditionary Force (MEF) – principal war fighting organization.
- Marine Expeditionary Brigade (MEB) – Constructed around a reinforced infantry regiment – task-organized to meet requirements of a specific situation.
- Marine Expeditionary Unit (MEU) – Provides forward deployed units for a variety of quick reaction sea-based, crisis response options in a conventional amphibious/expeditionary role.

The MAGTF is the Marine Corps' principal organization for missions across the range of military operations. It is composed of forces task organized under a single commander and can respond rapidly to a contingency anywhere in the world. MAGTF forces are functionally grouped into four core elements:

See JP 3-02.1 Amphibious Embarkation and Debarkation

- Command Element (CE)
- Ground Combat Element (GCE)
- Logistics Combat Element (LCE)
- Aviation Combat Element (ACE)

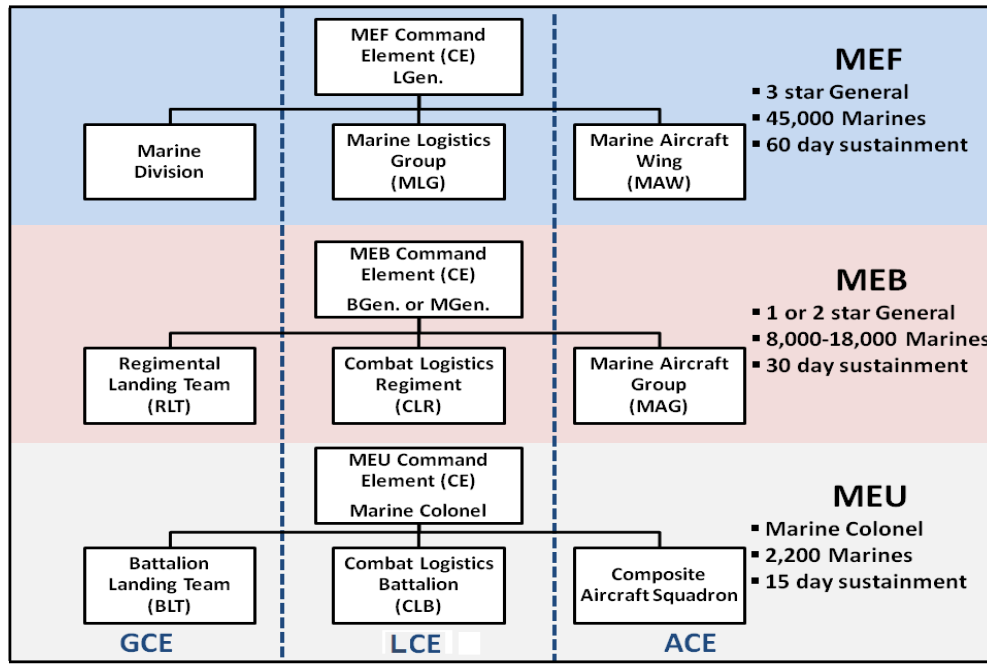


Figure 7.1

3. Capabilities

Marine Expeditionary Force (MEF). A MEF is the largest MAGTF and is the Marine Corps' principal warfighting organization. Normally commanded by a lieutenant general, it is task organized around a permanent CE and normally contains one or more MARDIVs, a MAW, and an MLG. Elements comprising the GCE, ACE, and LCE of MEBs and MEUs are drawn from MEF Maritime Support Element (MSE0, and may be augmented by forces from other MEFs, MARFORs, other services, or coalition military forces. The size and composition of a deployed MEF can vary greatly depending on the requirements of the mission. A MEF is capable of missions across the full range of military operations, including amphibious assault and sustained operations ashore in any environment. It can operate from a sea base, land base, or both, and typically deploys with more than 45,000 personnel with up to 60 days of sustainment.

The MEF is a tailorable and scalable force that can be equipped and task organized to conduct forcible entry operations, operate independently, serve as a JTF HQ, or operate as a JTF.

A MEF can range in size from less than one, to multiple divisions and aircraft wings, together with one or more Marine Logistics Group (MLG). Permanent MEF Headquarters are located as follows:

- I MEF - Camp Pendleton, California
- II MEF - Camp Lejeune, North Carolina
- III MEF - Okinawa, Japan

Marine Expeditionary Brigade (MEB). The MEB is a unit of the USMC MAGTF constructed around a re-enforced regiment, a composite Marine aircraft group, and a Brigade Service Support Group. The MEB, commanded by a general officer (usually a Major General or sometimes a Brigadier General), 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 MEF, or alone. It varies in size and composition, and is

larger than a MEU but smaller than a MEF.

Marine Expeditionary Unit (MEU). Forward deployed MEUs embarked aboard Amphibious Ready Group (ARG) shipping operate continuously in the areas of responsibility of numerous Unified Commanders. These units provide the National Command Authorities and Unified Commanders an effective means of dealing with the uncertainties of future threats. The MEUs provide forward deployed units which offer unique opportunities for a variety of quick reaction sea-based, crisis response options in either a conventional amphibious/expeditionary role, or in the execution of maritime special operations. The forward deployed MEU, forged and tested in real-world contingencies, remains the benchmark forward operating Marine Force.

The inherent capabilities of a forward-deployed MEU are divided into two broad categories:

(1) Amphibious Operations

Amphibious Assault

Amphibious Raid

Maritime Interception Operations

Enabling Operations

(2) Crisis Response and Limited Contingency Operations

Noncombatant Evacuation Operations

Foreign Humanitarian Assistance

Integrate with Joint, Interagency, Intergovernmental and Multinational Organizations (JIIM)

Tactical Recovery of Aircraft and Personnel

Embassy Reinforcement

Aviation Operations from Expeditionary Shore-based Sites

Theater Security Cooperation

Airfield/Port seizure

Expeditionary Strike

Maritime Raid Force (MRF). The MRF is organized to perform raids, assault, explosive breaching, internal security, and sniper functions both afloat and ashore. The MRF is internally task organized from the assets of the MEU and the ARG and will typically consist of forces sourced from the CE (reconnaissance, combat camera), GCE (infantry, combat engineers), ACE and LCE (EOD) organized into an assault element, security element and a support element. The assault element is typically Marine forces trained in close combat, methods of entry (breaching) and precision shooting. The security element is typically Marine forces trained in offensive and defensive ground operation and precision shooting. The support element is typically Marine and Navy aviation forces, logistics forces, surface warfare specialists, site exploitation and other required capabilities. The MRF is not a special operations force. It provides highly trained forces for specific missions, to include VBSS, afloat and ashore precision raids, QRF, TRAP and SOF support.

See Appendix B for Standard MEU Equipage

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MEU COMPOSITION

REFERENCES:

- a) JP 3-02, Amphibious Operations
- b) NTTP 3-13.2

1. Introduction. The MEU is a scalable force that can be organized and equipped in order to meet the needs of the operation and mission.

2. MEU Structure

a. Command Element (CE). The CE is a permanent organization composed of the MEU/PHIBRON commander, executive and special staff sections, HQ section, and requisite communications support, intelligence, and reconnaissance forces necessary to accomplish the MAGTF mission. The CE provides C2, intelligence, and other support essential for effective planning and execution of operations by the other MAGTF elements. The CE varies in size and composition, and conducts liaison with higher, adjacent, and supporting commands.

The CE contains the MAGTF headquarters, and other units that provide intelligence, communications and administrative and general support of the MAGTF. It is task organized to provide the command, control, communications, computers, intelligence, and interoperability (C4I) necessary for effective planning and execution of all operations. The CE is composed of the following:

- MAGTF Commander
- Deputy Commander
- Chief of Staff
- Special Staff Officers
- MEF or MEB Headquarters Group
- General/Executive Staff

Functions of the CE. Several key aspects of the CE activities are different from those of its major subordinate commands:

- Drive operations
- Requesting and integrating joint capabilities
- Collecting intelligence
- Deep, close, and rear operations
- Deception and psychological operations
- CBRN defense
- Interoperable command, control, and communications (C4I) network
- MAGTF concept of operations

Task organizing the MAGTF forces. Functional responsibilities are the same for each echelon of command within the MAGTF. These functional areas serve to establish the focus-of-effort of the MAGTF CE.

- Manpower and Administration (G-1)
- Intelligence (G-2)
- Operations (G-3) Current Operations, Future Operations, Current Plans, Fires and Effects Coordination Center, Aviation Operations, and Cyberspace/Electronic Warfare

- Coordination Center Logistics/Combat Service Support (G-4)
- Future Plans (G-5)
- Command, Control, Computers and Communications (G-6)
- Expeditionary Operations Training Group (G-7)
- Comptroller/Fiscal (G-8)
- Chemical, Biological, Radiological, Nuclear and Explosive (CBRNE)
- Information Operations
- Space Operations

b. Ground Combat Element (GCE). The GCE is task organized to conduct ground operations. It is usually constructed around an infantry organization, but can vary in size from a small ground unit of any type to one or more Marine Divisions (MARDIV) that can independently maneuver. The GCE also includes appropriate combat support (CS) units. It is generally through the GCE that the MAGTF generates combat power through the use of firepower and mobility. Normally, there is only one GCE in a MAGTF.

Division. The MARDIV is a balanced force of combat and CS units. It is a major administrative and tactical unit that is organized and equipped to conduct sustained combat operations with or without reinforcement.

Regimental Landing Team (RLT). A RLT is task organized for amphibious landings and is comprised of an infantry regiment reinforced by elements from the Artillery Reg, Assault Amphibian Bn (AAVs), Tank Bn, Light Armored Reconnaissance (LAR) Bn, Combat Engineer (CE) Bn and Reconnaissance Bn. The RLT may be employed as an integral part of a division or as a semi-independent or independent maneuver unit.

Battalion Landing Team (BLT). A BLT is task organized for amphibious raids and landings and is comprised of an infantry battalion reinforced by elements from the Artillery Reg, Assault Amphibian Bn (AAVs), Tank Bn, Light Armored Reconnaissance (LAR) Bn, Combat Engineer (CE) Bn and Reconnaissance Bn. The BLT may be employed as an integral part of the RLT or as a semi-independent or independent maneuver unit.

c. Aviation Combat Element (ACE). The ACE is task organized to conduct aviation operation in direct support of the MAGTF. The ACE executes all or a portion of the six functions of Marine aviation necessary to accomplish the mission. These function are anti-air warfare (AAW), offensive air support (OAS), assault support, electronic warfare (EW), aerial reconnaissance and control of aircraft and missiles.

Marine Aircraft Wing (MAW). The MAW is a balanced force of combat, combat support and combat service support units. It is a major tactical unit that is organized and equipped to conduct sustained combat operations with or without reinforcement. It is usually associated with the Marine Expeditionary Force (MEF) sized MAGTF and is the entire Wing forms the ACE of a MEF.

Marine Aircraft Group (MAG). A MAG is task organized organization comprised of a aviation HQ, flying squadrons, an aviation logistics squadron, aviation command and control squadrons and aviation ground support squadrons. The MAG is normally associated with a Marine Expeditionary Brigade (MEB) sized MAGTF and the reinforced MAG forms the ACE of the MEB.

Reinforced/Composite Squadron. Usually formed around a Marine Medium Tilt-rotor Squadron (VMM) with detachments from other flying squadrons, aviation logistic squadrons, command and control squadrons and aviation support squadrons. The reinforced/composite VMM is normally associated with a Marine Expeditionary Unit (MEU) or Special Purpose MAGTF (SPMAGTF) and forms the ACE of the MEU or SPMAGTF.

d. Logistic Combat Element (LCE). The LCE is task organized to provide direct and general support to all elements of the MAGTF in order to accomplish the MAGTF mission. The LCE executes all or a portion of the six functions of Marine logistics to include supply, maintenance, transportation, general engineering, health services and general services.

Marine Logistics Group (MLG). A MLG consists of combat service support organizations to include combat logistics regiments, a headquarters regiment, direct support and MEU combat logistics battalions, independent battalions (supply, transportation support, medical and dental). The MLG is normally associated with a MEF sized MAGTF and forms the LCE of the MEF.

Combat Logistics Regiment (CLR). Task organized to provide all the functions of Marine logistics. A CLR is normally associated with a MEB sized MAGTF and forms the LCE of the MEB.

Combat Logistics Battalion (CLB). Task organized to provide the six functions of Marine logistics. The CLB is normally associated with a MEU or SPMAGTF sized MAGTF and forms the LCE of the MEU prof or SPMAGTF

3. Composition

a. Ground Combat Element (GCE). The GCE is task organized to conduct ground operations and to support the MAGTF mission and structured around a reinforced infantry battalion that forms a Battalion Landing Team (BLT). This element will be a composite of infantry, artillery, reconnaissance, armor, light armor, assault amphibian, engineer, and other forces needed.

Battalion Landing Team – Consist of approx. 1,200 Marines and Sailors, headquarters and service company, rifle companies, weapons company, artillery battery, AAV platoon, light armored reconnaissance platoon or company, tank platoon, combat engineer platoon, and a reconnaissance platoon.

Artillery Battery – A company-sized unit, often used as a provisional rifle company, also provides the battalion with long-range indirect fire support (when operating ashore). The Battery brings 777/155mm towed artillery and trucking support.

Assault Amphibian Vehicle (AAV) Platoon – Provides mechanized lift for a “mechanized company.”

Reconnaissance Platoon – Not all MEUs deploy with a “Recon” Detachment. Due to a reorganization of the Recon Battalion in MarDiv, there is a shortage of reconnaissance units. This unit would provide distant reconnaissance for the battalion.

Combat Engineer Battalion Detachment – Limited capability to construct obstacles and conduct demolitions.

b. Aviation Combat Element (ACE). The ACE is built around a composite tilt-rotor squadron that includes twelve MV-22 Osprey Aircraft and six AV-8B Harrier/F-35B Lightning attack aircraft. Two shore-based KC-130s are also kept on a 96-hour CONUS stand-by to support MEU missions. All pilots train to fly at night with Night Vision Goggles (NVGs), and assault support tiltrotor and rotary wing aircraft are configured for Fast-Roping. Each ACE deploys with the following elements:

Marine Medium Helicopter Squadron (HMM) Detachment – Marine Medium Tiltrotor Squadron - MV-22 Osprey used primarily for assault support.

Marine Heavy Helicopter Squadron (HMH) Detachment – Four CH-53E Super Stallions used for equipment transport and heavy lift.

Marine Light Attack Helicopter Squadron (HMLA) Detachment – Four AH-1Z Cobra attack helicopters and three UH-1Y Huey assault support helicopter used for offensive air support, assault support and command and control.

Marine Fighter Attack Squadron (VMFA) Detachment – Consists of F-35B Lightning aircraft used for AAW, OAS, and EW.

Marine Air Control Group (MACG)/Low Altitude Air Defense (LAAD) Detachment – A MEU will normally deploy with a LAAD Section (anywhere from 5 to 15 teams). Each team consists of two personnel and six weapon systems. The teams normally go ashore with the GCE in direct support.

Marine Wing Support Squadron (MWSS) Detachment – Consists of aviation refuelers, airfield repair, helicopter support team (HST), and other aviation logistics capabilities.

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AMPHIBIOUS READY GROUP & PHIBRON COMPOSITION

REFERENCES:

- a) JP 3-02, Amphibious Operations
- b) NTTP 3-13.2

1. Introduction. In an ARG/MEU construct, the ATF is typically comprised of three L-class ships, naval surface fires support (NSFS) platforms, and Navy Support Elements (NSEs) from Naval Beach Group (NBG), Tactical Air Squadron (TACRON), and Fleet Surgical Team (FST) and is referred to as an Amphibious Ready Group. In this composition, the CATF role would be filled by the PHIBRON Commodore.

2. Amphibious Squadron (PHIBRON) Composition. The commander's deputy or chief of staff directs the staff in production of all planning directives and memoranda publishing. They are responsible for supervising preparation, promulgation and execution of operational plans and orders and will act as CATF when situation dictates. Notionally, the staff is organized in the following manner.

a. N-1 – Administration. The N1 handles all official correspondence and runs the staff administration office. They are responsible for maintaining personnel records, submitting command reports and tracking manning throughout the ARG. The N1 role is typically filled by a Chief Petty Officer or Navy lieutenant.

b. N-2 – Intelligence Officer. The staff intelligence officer collects, evaluates and disseminates pertinent military intelligence. The N2 is responsible for liaising with other intelligence sources and agencies to develop hydrographic and terrain studies and prepare and coordinate staff intelligence briefings.

(1) Cryptologic Resource Coordinator (CRC). The officer assigned the responsibilities for management of cryptologic assets, cryptologic coverage and tasking plans, personnel and augmentation requirements, cryptologic direct support operations, signal security operations, direct service interfaces, cryptologic sanitation, and correlation procedures. The CRC should be collocated with the OTC staff and should have representatives in the CWC's SUPPLOT watch area. The alternate CRC should be located on the ship with the best cryptologic resources.

Typically, a senior enlisted Sailor from one of the Navy Information Operations Commands (NIOCs) is assigned to the CRC as an assistant CRC. Together, they coordinate the cryptologic effort of the group to which they are attached while receiving support from each units' Ships Signal Exploitation Space (SSES) Division Officer/SIGWO. Additionally, each sensor platform is assigned an Electronic Warfare Officer to serve as the principal EW planner who develops operation plans (OPLANs) and concept plans (CONPLANs), plans and monitors routine EW operations and activities, and coordinates joint EW training and exercises.

- c. N-3 – Operations Officer. The N3 is responsible for all operational matters for the staff including preparing staff planning directives and memoranda for basic operational orders and directives. They keep the staff informed of standard fleet operating procedures, current tactical doctrine, rules of engagement and changes in operational control. This is typically the largest N-code and includes subject matter experts in anti-submarine warfare (ASW), air operations, anti-terrorism force protection (ATFP), supporting arms coordination center (SACC), naval surface fires support (NSFS), and mine warfare (MIW).
 - d. N-4 – Logistics and Materiel Officer. The N4 is overall responsible for the logistical matters of all assigned units. They review shipyard overhaul lists, track and review casualty reports (CASREPs), review and assess engineering and damage control training of assigned units, and arrange for necessary logistics support via logistics requests (LOGREQs).
 - e. N-5 – Future Operations Officer. The N5 assists the Commander in long range and future planning for the staff and assigned units within the ATF.
 - f. N-6 – Communications Officer. The N6 tracks the material status of all C5I equipment on assigned units and directs flagship and squadron communications.
 - g. N-7 – Training and Exercises Officer. The N7 tracks and reports on the readiness of assigned commands while acting as the primary planner for all upcoming exercises the staff or subordinate units will participate in.
 - h. N-8 – Deputy Information Warfare Commander (DIWC). The DIWC is responsible for all matters dealing with Information Operations: operational security (OPSEC), military information support to operations (MISO), military deception (MILDEC), electronic warfare (EW), and computer network operations (CNO).
 - i. N-9 – Combat Cargo Officer (CCO). The staff CCO works closely with ship and landing force embark officers to ensure load plans are accurate and sufficient. They are also responsible for maintaining up to date information on developing cargo handling operations and keep accountability of long-range operational load commitments.
 - j. Navy Criminal Investigative Service (NCIS). Special agent afloat conducts ATFP assessments and is involved in all ARG/MEU investigations.
 - k. Judge Advocate General (JAG). Assist the Commodore in all legal matters regarding the ATF and legal administration.
3. Navy Support Element (NSE) Composition & Responsibilities
- a. Tactical Air Officer (TACRON)
 - (1) Prepares Air Operations Appendix to OPORDER and assists in preparation of the anti-air warfare appendix.
 - (2) Assists in helo ship-to-shore movement appendix.

- (3) Briefs air units and other commands in air matters.
- (4) Assists in collection and preparation of aviation intelligence.
- (5) Acts as tactical air officer and/or tactical air control center director.
- (6) Responsible for execution of air operation plan, including coordination or control of all aircraft entering or passing through the Amphibious Objective Area (AOA).

b. Naval Beach Group

- (1) Liaison with staff of Assault Craft Unit (ACU) and Beachmaster (BMU).
- (2) Directs and coordinates training and administration of naval beach group activities.
- (3) Ensures waterborne craft and causeways are effectively used.
- (4) Provides BMU and ACU tactical components as elements of Landing Force Shore Party/Beach Party Team in landing one beach landing team (BLT) over one numbered beach.
- (5) Assists the N-3X in preparation of ship-to-shore movement section of the OPTASK AMPHIB.

c. CATF Surgeon

- (1) Directs and coordinates the Fleet Surgical Team (FST) training and administration.
- (2) Advises CATF on all medical matters
- (3) Develops the mass casualty plan and recommends selection of Primary Casualty Receiving and Treatment Ships (PCRTS).

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EXPEDITIONARY STRIKE GROUP

REFERENCES:

- a) JP 3-02, Amphibious Operations
- b) NTTP 3-13.2, Navy Information Operations Warfare Commander's Manual
- c) OPNAVINST F3501319B, Required Operational Capabilities (ROC) And Projected Operational Environment (POE) For Expeditionary Strike Group Staffs

1. Introduction. ESGs provide a deployable, scalable, Flag Officer led Command Element (CE) with task organized naval forces to fulfill Combatant Commander and Fleet Commander operational requirements up to Marine Expeditionary Brigade (MEB) sized amphibious operations.

2. Organization. An ESG CE will be manned to perform the typical functions expected when in command of an afloat ESG. The deployed ESG CE staff is typically organized under the ESG Commander or ESG Deputy Commander, and Chief of Staff (COS) into six directorates:

Administration (N1)	Intelligence (N2)	Operations (N3)
Logistics, Maintenance, & Materiel (N4),	Plans (N5)	Command, Control, Computers, Communications, Combat Systems, and Intelligence (C5SI) (N6)

The deployed ESG CE may be further supported by other personnel provided from organic ESG personnel (i.e. intelligence and message processing support from LHA, LHD and flagship personnel and PHIBRON and Marine expeditionary unit (MEU) Special Operation Command Staff, etc.). When the ESG is ashore, these functions along with other needed skills (i.e. medical support, force protection, civil affairs, contracting services, etc.) will need to be filled by cognizant authorities using a request for forces submission to the appropriate Combatant Commander and Joint Staff.

ESG Commander. Acts as Commander, Amphibious Task Force and shall be a co-equal planner with an MEB CG.

ESG Deputy Commander. The ESG Deputy Commander functions under the ESG Commander for operational matters pertaining to the ESG and Staff. He or she is responsible for ensuring the organization, administration, training, readiness and operations of the deployed Staff are carried out in conformance with the policies, plans and intentions of the ESG Commander. The Deputy Commander will normally be a U.S. Marine Corps (USMC) O-6. In the event the ESG Commander is a General Officer (GO), the Deputy Commander will normally be a Navy O-6.

ESG COS. The ESG COS functions under the ESG Commander for administrative matters pertaining to the entire ESG Staff itself. When the ESG Commander is deployed, the ESG COS will exercise command authority for the Reserve Element and assigned units. He or she is responsible for ensuring the organization, administration, training, readiness, and operations of the CE are carried out in conformance with the policies, plans and intentions of the ESG Commander.

Assistant COS for Administration (N1)

Assistant COS for Intelligence (N2)

Assistant COS for Operations (N3)

Assistant COS for Logistics and Materiel (N4)

Assistant COS for Plans (N5)

Assistant COS for C4SI (N6)

Other Key Staff Billets

- a. Staff Judge Advocate (NOOJ).
- b. Public Affairs Officer (NOOP).

When deployed, the following billets may be filled from ESG assigned forces (e .g. assigned or attached units):

Strike Group (SG) Surgeon (dual duty from PHIBRON and fleet surgical team, when embarked)

Chaplain (dual duty from amphibious assault ship (general purpose) (LHA/(LHD), when embarked)

SG Navigator (dual duty from flagship, when embarked)

Explosives Ordnance Disposal (EOD) Officer in Charge (OIC) (dual duty from the EOD detachment, when embarked)

Naval Sea, Air, Land (SEAL) Teams OIC (dual duty from the SEAL Detachment, when embarked)

Meteorology and Oceanography Officer (dual duty from LHA and LHD when embarked)

The following is a list of key personnel and special assistants based on ESG mission essential tasks:

3. Capabilities

An ESG may be formed to provide additional amphibious warfare expertise and advocacy in the event of more complex operations including Amphibious Task Force, Maritime Prepositioning Force, Logistics Over The Shore, Defense Support of Civil Authorities and Emergency Sortie operations to support a full range of theater contingencies, ranging from humanitarian assistance and disaster relief to full combat operations.

There is a wide range of missions that the ESG Reserve Element (RE) could be assigned. The ESG RE shall be manned to carry out the Continental United States missions of the ESG regardless of the deployed ESG CE Staff. The ESG will remain cognizant that needed skill sets may be resident on other Staffs, in adjacent units, or even provided by a civilian entity.

EXPEDITIONARY STRIKE GROUP MISSION AREAS															
AMW	ASW	AW	CCC	FHP	FSO	INT	IO	LOG	MIW	MOB	MOS	NCO	NSW	STW	SUW
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
AMW: Amphibious Warfare ASW: Anti-Submarine Warfare AW: Air Warfare CCC: Command Control and Communication FHP: Force Health Protection FSO: Fleet Ship Operation INT: Intelligence Operation								IO : Information Operation LOG: Logistic MIW: Mine Warfare MOB: Mobility MOS: Missions of State NCO: Non-Combat Operation NSW: Naval Special Warfare STW: Strike Warfare SUW: Surface Warfare							

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AMPHIBIOUS OPERATIONS

REFERENCES:

- a) JP 3-02, Amphibious Operations
- b) JP 3-02.1, Amphibious Embarkation and Debarkation

1. Introduction. Amphibious operations use maneuver principles to transition ready-to-fight combat forces from the sea to the shore in order to achieve a position of advantage over the enemy.

Certain amphibious operations (e.g., assaults and raids) seek to **exploit the element of surprise and capitalize on enemy weakness** by projecting and applying combat power precisely at the most advantageous location and time. Other types of amphibious operations may be conducted more deliberately with an intent of making various audiences aware of intended actions (e.g., demonstrations and crisis response and other operations).

1. Types of Amphibious Operations (DRAW)(O)

- a. Amphibious Demonstration. An amphibious demonstration is a show of force where a decision is not sought and no contact with the adversary is intended. A demonstration's intent is to deceive the adversary, causing the adversary to select an unfavorable course of action (COA).
- b. Amphibious Raid. An amphibious raid is a type of amphibious operation involving swift incursion into or temporary occupation of an objective followed by a planned withdrawal. Amphibious raids may be conducted to temporarily seize an area in order to secure information, confuse an adversary, capture personnel or equipment, or to destroy a capability.
- c. Amphibious Assault. An amphibious assault involves the establishment of an LF on a hostile or potentially hostile shore. The organic capabilities of AFs, including air and fire support, logistics, and mobility, allow them to gain access to an area by forcible entry.
- d. Amphibious Withdrawal. An amphibious withdrawal is the extraction of forces by sea in ships or craft from a hostile or potentially hostile shore.
- e. AF Support to Crisis Response and Other Operations. A type of amphibious operation that contributes to conflict prevention and crisis mitigation. AFs routinely conduct amphibious operations in response to crises and support to other operations such as: security cooperation, defense support of civil authorities (DSCA), foreign humanitarian assistance (FHA) (to include disaster relief), noncombatant evacuation operations (NEOs), peace operations, or recovery operations.

2. Phases of an Amphibious Operation (PERMA) – Doctrine based

- a. Planning. The Planning phase normally denotes the period extending from the issuance of an initiating directive that triggers planning for a specific operation and ends with the embarkation or reconfiguration of landing forces. However, planning is continuous throughout the operation.

Note: Berthing and Loading Schedule (BALS CONF), Load plan submission for approval, Naval Support Element Augmentation message (NSEA).

b. **Embarkation.** The embarkation phase is the period during which the landing force with its equipment and supplies embark or reconfigure in assigned shipping. The landing plan and the scheme of maneuver ashore will influence which staffs and units are embarked on which ships, the number and type of landing craft that will be embarked, and how the units will be phased ashore. The organization for embarkations needs to provide for flexibility to support changes to the original plan.

Note: Organization for Embarkation and Assignment to Shipping (OEA&S), Pre Embarkation Shipboard Accommodations Inspection Report (PESAIR).

c. **Rehearsal.** The rehearsal phase is the period which the prospective operation is rehearsed to:

- (1) Test the adequacy of plans, timing of detailed operations, and combat readiness of participating forces.
- (2) Provide time to all echelons to become familiar with plans.
- (3) Test communication and information systems.

Note: COA Development, Confirmation Briefs, writing of OPTASK Amphib message.

d. **Movement.** The movement phase is the period during which various elements of the amphibious force move from points of embarkation or from forward-deployed position to the area of operations. This move may be via rehearsal, staging, or rendezvous areas. The movement phase is completed when various elements of the amphibious force arrive at their assigned positions in the area of operations.

e. **Action.** The action phase is the period from the arrival of amphibious force in the operational area through the accomplishment of the mission and the termination of the amphibious operation.

3. **ARG/MEU Load out:** PERMA is doctrine based; however, actual load outs occur sequentially much differently. The acronym EMPRA is employed when discussing today's ARG/MEU loading.

- a. **Embarkation**
- b. **Movement**
- c. **Planning**
- d. **Rehearsal**
- e. **Assault**

4. **CATF Responsibilities**

- a. Provide SLCP to CLF
- b. Allocate shipping to CLF
- c. Organize naval forces for embarkations
- d. Overall embarkation schedule

e. Review & approve embarkation & load plan

5. CLF Responsibilities

- a. Determine shipping requirements
- b. Organize for embarkation
- c. Prepare embarkation plans
- d. Prepare loading plans
- e. Load aboard ships

6. Commanding Officer

- a. Provide SLCP- updated annually
- b. Prepare troop spaces based on letter of agreement
- c. Ensure auxiliary equipment is ready to support load out
- d. Approve load plan
- e. Plan/execute the embarkation

7. Types of Loading

a. Administrative loading. A loading method that gives primary consideration to achieving maximum utilization of troop and cargo space without regard to tactical considerations. Equipment and supplies must be unloaded and sorted before they can be used. (Also called commercial loading).

- (1) Rations
- (2) Vehicles
- (3) Water/Misc
- (4) Commodity Loading

b. Combat Loading. A loading method that gives primary consideration to the facility with which troops, equipment, and supplies can be unloaded ready for combat, rather than to economical use of ship space. Combat loading is the arrangement of personnel and the stowage of equipment and supplies in a manner designed to conform to the anticipated tactical operation of the organization embarked. Examples include:

- (1) Vehicles, Rations
- (2) Armor, Medical
- (3) Ammo, Water

c. Spread Loading. One method of loading by which the desired dispersion of LF personnel, equipment, and supplies among various ships is achieved. This method is commonly used when loading organizations are equipped with numerous vehicles and/or large amounts of heavy equipment. Combat spread loading also permits maximum flexibility and a rapid buildup ashore.

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AMPHIBIOUS OPERATIONS COMMAND & CONTROL

REFERENCES:

- a) JP 3-02, Amphibious Operations
- b) NWP 3-02.1.4M/MCWP 3-31.8, Defense of the Amphibious Task Force
- c) NWP 3-56, Composite Warfare: Maritime Operations at the Tactical Level of War

1. Introduction. Protection of the AF is essential for all amphibious operations, but especially during ship-to-shore movement. During the planning phase of an amphibious operation, the active protection of the ATF and LF is one of the most important considerations. The nature of amphibious operations inherently limits the ATF's ability to use maneuver and deception for defense, thus requiring thorough shaping operations to achieve maritime and air superiority as well as a layered defense of organic and inorganic sensors and weapons in the presence of an enemy force.

Coordination among the organizations early in the planning process is critical and should lead to a draft support relationship that could be recommended for inclusion in an establishing directive promulgated by the establishing authority. Consideration should be given to the following factors:

- Under all circumstances, upon activation of the Amphibious Objective Area (AOA) or operational area, unity of effort within the AOA or operational area must be maintained to ensure that the CATF and CLF retain that degree of authority necessary to ensure success of the operation.
- A CSG may be assigned the single mission of providing direct support to the AF, but more likely, the CSG will be assigned multiple missions in support of the larger joint operation which will significantly affect command and support relationships and coordination requirements. **The JFMCC must therefore ensure early and continuous liaison across components to ensure optimal prioritization and employment of shared assets in support of the CATF.**

2. Composition. The JFC and JFMCC may need to provide the required naval and joint assets needed to protect the ATF, which may include additional CRUDES and submarines assets, mine countermeasures forces, theater ASW, joint defensive counter-air (DCA), information operations, etc., for transit as well as in the littorals. Consolidation of assets along with the **requisite integration of CWC doctrine with amphibious doctrine** is difficult due to the wide variety of tactical situations that may be encountered.

These relationships should lead to a draft support relationship that could be recommended for inclusion in an establishing directive promulgated by the establishing authority. The final support relationship between a **CSG commander, other commanders shaping the operational environment, and the CAF, CATF, and CLF should be outlined** in the establishing directive.

As the CATF/CLF relationship is developed, these commanders shall work out the details of their supporting/supported relationship with respect to the defense of the ATF. These **commanders may choose to document procedures for anticipated support through a Memorandum of Agreement, if desired.**

3. Supporting Situation Options in CWC Construct. With the above factors in mind, the following is a description of three supporting situations. The supporting situation used is based on the command structure, the mission, and the threat and may be tailored, as desired, to the specific requirements of the mission.

a. Supporting Situation Alpha (SUPSIT A)

The support force is to join and integrate with the ATF. The CATF becomes the CWC of the combined force. All forces are integrated under a single CWC and set of warfare commanders. This situation is most applicable to the movement phase.

b. Supporting Situation Bravo (SUPSIT B) (Coordinated)

The support force does not join but provides support as designated by establishing authority. The CATF coordinates the tactical operations of all assigned and supporting forces. The supporting commander is authorized to answer directly to the supported force's requests for assistance and may establish a CWC to provide the support. This situation also applies during the movement phase and action phase. The individual CSG or task group should remain intact.

c. Supporting Situation C (SUPSIT C) (Discretion)

Each force has its own CWC and warfare commanders. Force (ATF, CSG, others) integrity is maintained. The CWCs operate in mutual support to achieve the same broad mission objectives, but each has discretion as to how best to support the other. This relationship is most applicable when the forces have multiple joint force requirements beyond the amphibious operation.

The Navy developed the CWC concept to enable the fleet to effectively carry out the multi-threat defense of a carrier battle group. Therefore, CWC was developed as a defense-oriented doctrine. The addition of strike warfare gives it an offensive capability; however, its basic design was built on the need to protect a large naval force. The Amphibious Task Force (ATF), on the other hand, is offensively-oriented.

Amphibious warfare in CWC warfare presents a number of challenges that will not be addressed in this section however, in an attempt for simplicity and clarity; the CATF/CLF, AA in the CWC concept are all coequals during the planning phase of operations. During the execution phase the AA is overall in charge. In some instances AA and CATF are the same but not always, hence the need for a coequal relationship in planning to clarify resource use and asset management prior to execution phase of an operation.

4. Role & Responsibilities. The following considerations for the use of LF assets for the defense of the ATF should be addressed prior to the movement phase. This list is neither prescriptive nor all inclusive:

- Define which assets are available for support (i.e., aircraft, snipers, crew-served weapons, LAAD).
- Determine ordnance availability and source (ship's load out or L-Form).
- Determine the integration and deconfliction of LF weapons systems with ATF weapons systems, including ATF aircraft.
- Define alert conditions and authority to activate.
- C2 considerations/weapons release authority/order to fire
- Communications plan.
- Rules of engagement/supplemental rules of engagement.
- Develop integrated quick reaction force training.

Officer in Tactical Command

- a) Designate principal warfare commanders.
- b) Issue ROE guidance to operational forces.
- c) Provide commander's intent and guidance for defense of the ATF.
- d) Assess threat environment and request additional inorganic support and/or theater assets as required.

Warfare Commanders

- a) Include DATF guidance and procedures in planning and promulgation of standing OPTASKs and coordinate between all stakeholders as required to ensure unity of effort.
- b) Be prepared to direct and execute defense of the ATF.

All Ships

- a) Incorporate LF quick reaction force teams into the ship's battle orders and internal communications plan.
- b) Assist quick reaction force personnel in the breakout and distribution of LF ordnance.
- c) For ships with embarked aircraft, be prepared to
 - (1) Employ rapid aircraft launch/land procedures.
 - (2) Rapidly breakout and transport aviation ordnance.
 - (3) Identify number of sorties, on-station times, and ordnance loadouts available for defense of the ATF.
 - (4) Participate in DATF SOP development.

LF Commander

- a) Identify ACE and GCE quick reaction force support available.
- b) Identify number of sorties, on-station times, and ordnance loadouts available for defense of the ATF.
- c) Participate in SOP development.
- d) Provide the air coordination board with aircraft capabilities and weapons employment considerations for defense of the ATF.
- e) Execute missions as agreed upon in the air tasking order and be prepared to support the principal warfare commanders for DATF.

Decisions Responsibilities Matrix

Primary Decision	May Be Contained In the Initiating Directive	Decision
Determine amphibious force mission(s)	X	CAF*
Select amphibious force objective(s)	X	CAF*
Select course of action		CAF*
Select date and hour of landing	X	CAF*
Supporting Decisions		
Select method of entry		CATF/CLF
Select landing areas		CATF/CLF
Select landing beaches		CATF/CLF
Determine sea echelon plan		CATF
Select landing force objectives		CLF
Select landing zones and drop zones		CLF

*CATF/CLF mutually agreed upon recommendations to CAF for final concurrence.

Legend

CAF commander, amphibious force
CATF commander, amphibious task force

CLF commander, landing force

Figure 8.1

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AMPHIBIOUS OPERATIONS PLANNING

REFERENCES:

- a) MCWP 5-1, Marine Corps Planning Process
- b) MCDP 1-0, Marine Corps Operations
- c) MCWP 3-31.7/ NWP 3-62M, Seabasing
- d) NTTP 3-02.1M/MCWP 3-31.5, Ship-to-Shore Movement
- e) JP 3-02, Amphibious Operations
- f) NWP 5-1, Navy Planning

1. Introduction. Because planning must support the commander’s decision making especially in a time competitive and evolving situation—the MCPP codifies the central role of the commander in planning. The process is applicable across the range of military operations and at any echelon of command. It can be as detailed or abbreviated as time, staff resources, experience, and the situation permit or require.

2. Deliberate Planning Overview. For units with staffs, the Marine Corps planning process (MCPP) is most appropriate. It is a six-step process. The MCPP is used by both Navy and Marine Corps staffs during planning for amphibious operations. If amphibious operations are part of a larger maritime campaign, it is likely that the Fleet Commander or JFMCC will use the Navy Planning Process, which is complementary to the CATF/CLF using MCPP provided the staffs are mutually aware of each other’s planning process.

The (6) Steps of the MCPP

Problem Framing	COA Development	COA War Game	COA Comparison & Decision	Orders Development	Transition
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Table 9.1

Planning is a complex process of interacting activities with feedback loops. The six steps of the MCPP aid in understanding and generally follow a sequence; however, planning is not a simple sequence of steps. Any one step of the process may involve multiple phases. Any step in the process may feedback into a previous one.

- a. Problem Framing. The purpose of problem framing is to gain an enhanced understanding of the environment and the nature of the problem. **The critical output for problem framing is to produce a unit mission statement.**
- b. COA Development. Planners use the mission statement (which includes HHQ tasking and intent), commander’s intent, and commander’s planning guidance to develop several COAs. Each COA must be suitable, feasible, different, acceptable, and complete with respect to the current and anticipated situation.
- c. COA War Game. Each friendly COA is examined against selected threat COAs. A detailed assessment of each COA as it pertains to the threat and the environment.
- d. COA Comparison and Decision. Commander evaluates all friendly COAs against established selected criteria, then against each other and selects the COA that he deems most likely to accomplish the mission.

e. Orders Development. The staff takes the commander's COA decision, intent, and guidance, and develops orders to direct the actions of the unit. Orders serve as the principal means to express decision, intent, and guidance.

f. Transition. Transition is an orderly handover of a plan or order as it is passed to those tasked with execution of the operation.

3. Tenets of the MCPP

The tenets of the MCPP derive from the doctrine of maneuver warfare. These tenets guide the Commander's use of his staff to plan and execute military operations.

Top-Down Planning. The commander must not merely participate in planning, he must drive the process. His personal involvement and guidance are keys to planning.

Single-Battle Concept. Operations or events in one part of the battlespace often have profound and consequential effects on other areas and events; therefore, a commander must always view the battlespace as an indivisible entity.

Integrated Planning. Integrated planning is conducted to coordinate action toward a common purpose by all elements of the force. The **key to integrated planning** is to involve the right personnel from the right organizations in the planning process as early as possible to consider all relevant factors, reduce omissions, and share information broadly.

See MCWP 5-1 Marine Corps Planning Process, CH1

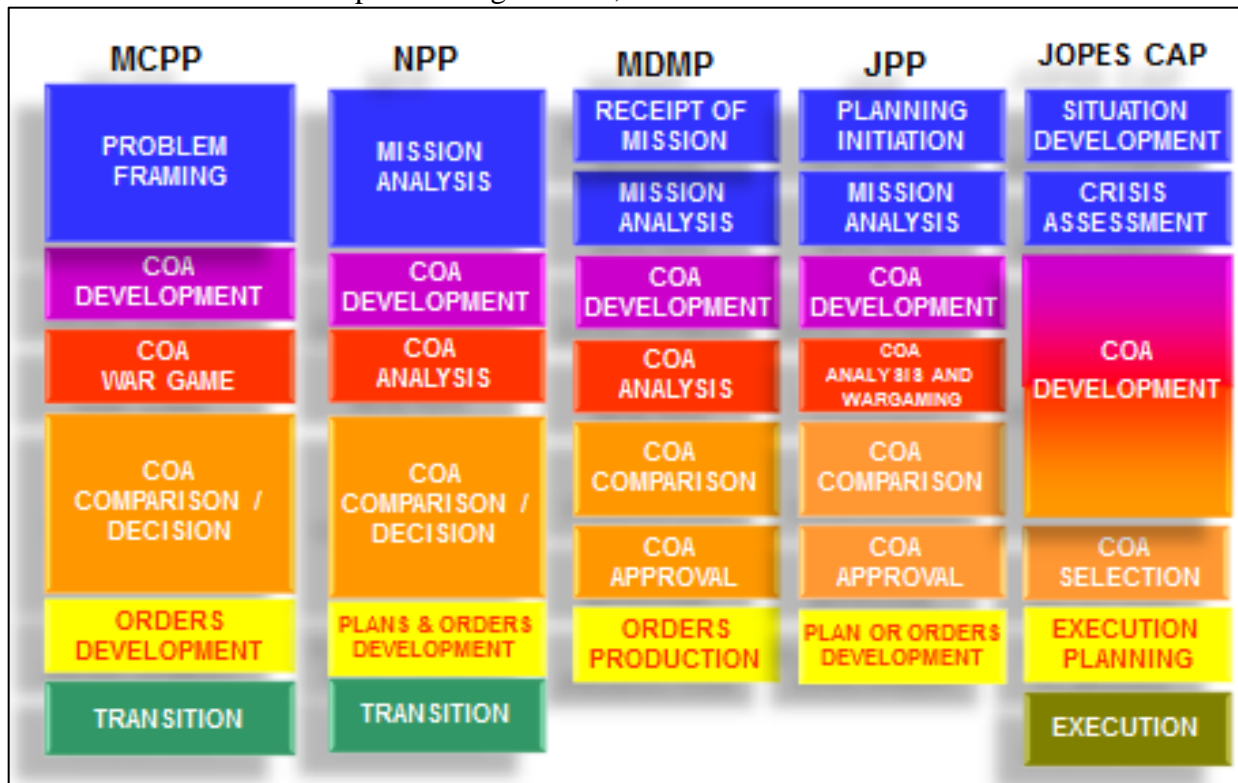


Figure 9.4
Planning Process Comparison

4. Warfighting Functions

The warfighting functions encompass all military activities performed in the battlespace. Warfighting functions are a grouping of like activities into major functional areas that aid in planning and execution of operations.

Advantages: Commanders and his planners look at all aspects of the battlespace to coordinate, control, influence, and synchronize.

Synchronize all warfighting functions to give maximum impact on accomplishing the desired objective within the shortest time possible and with minimum casualties.

See MCDP 1-0 Marine Corps Operations, App B

Warfighting Functions

Command & Control	Maneuver	Fires	Intelligence	Logistics	Force Protection
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Table 9.2

Command and Control. Command and control is the exercise of authority and direction by a properly designated commander over assigned and attached forces to accomplish a mission. **Command and control is the overarching warfighting function that enables all of the other warfighting functions.**

Maneuver. Maneuver is the employment of forces in the operational area through movement in combination with fires to achieve a position of advantage in respect to the enemy in order to accomplish the mission.

Fires. Fires use weapon systems to create a specific lethal or nonlethal effect on a target. Fires include:

- a. Collective and coordinated use of target acquisition systems
- b. Direct and indirect fire weapons
- c. Armed aircraft of all types, and other lethal and nonlethal means

***Fires are normally used with maneuver and help shape the battlespace, setting conditions for decisive action.**

Intelligence. Intelligence provides the commander with an understanding of the enemy and the battlespace and identifies the enemy's centers of gravity (COG) and critical vulnerabilities.

Logistics. Logistics encompasses all activities required to move and sustain military forces. At the tactical level, logistics is combat service support and involves:

Services	Health Services	Maintenance
Transportation	Supply	General Engineering

Table 9.3

Force Protection. Force protection is the measures taken to preserve the forces potential so that it can be applied at the appropriate time and place. It safeguards friendly centers of gravity and protects, conceals, reduces, or eliminates friendly critical vulnerabilities.

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RAPID RESPONSE PLANNING PROCESS OVERVIEW

REFERENCES:

- a) MCWP 5-1, Marine Corps Planning Process
- b) JP 3-02, Amphibious Operations

1. Introduction. If time does not allow use of the full, six-step MCPP, the commander and the planners may use the rapid response planning process (R2P2), which is a time-constrained version of the MCPP. The R2P2 enables the Amphibious Ready Group (ARG)/Marine Expeditionary Unit (MEU) to plan and begin execution of certain tasks within six hours and is highly dependent on the use of standing operating procedures (SOPs).

2. Rapid Response Planning Process Overview. The R2P2 enables the MEU to plan and begin execution of certain tasks within six hours and is highly dependent on the use of standing operating procedures (SOPs). R2P2 is successful when mission planning and preparation requirements are conducted concurrently. The rapid planning techniques discussed in this section focus on the ARG/MEU and its six-hour timeline, but these techniques may be tailored and employed to meet any unit's needs.

Planning Cells

Crisis Action Team (CAT). CAT is the central planning cell in the ARG and MEU. Although the CAT's final composition depends on the Commander and METT-T, its basic composition is established in the command SOP. Three factors to consider in determining membership in the CAT:

- a. Physical space available to accommodate the group
- b. Benefits of additional input from a wider array of functional areas
- c. Drawbacks of too many participants

Battlestaff. The battlestaff may consist of staff officers at the MEU, ARG, and MSE levels, plus representatives from attachments and functional areas not included in the CAT.

Mission Planning Cell. The mission commander establishes his own mission planning cell to plan the details of the operation. Based on space available mission commander may designate more than one planning cell in order to plan concurrent, contingency, or follow-on missions.

Process. As with the Marine Corps Planning Process, R2P2 is a process that allows Commanders and staffs to systematically gather and analyze mission specific information, develop Courses of Action (COA), evaluate and compare COAs, select a COA, conduct detailed planning, confirm the plan, issue the order, and execute the plan within 6 hours of receipt of a warning, alert, or execute order. Figure 4.1 illustrates the compressed process.

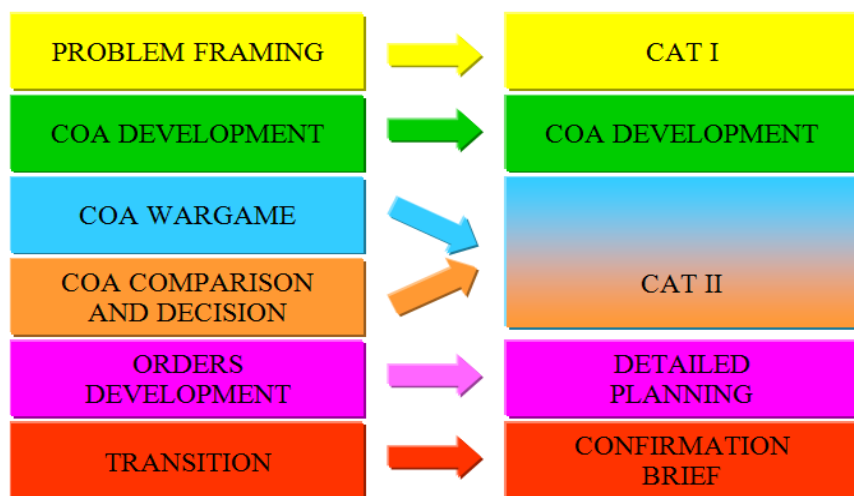


Figure 10.1
Deliberate Planning Process vs Rapid Response Planning Process

2. Rapid Response Planning Process Overview

Problem Framing. The entire CAT conducts problem framing in the same manner as the MCPP. The ARG and MEU commanders, beginning with the supporting commander, provide their planning guidance to the CAT and the battlestaff/mission planning cells at the conclusion of problem framing or any required staff orientation.

COA Development. The mission commander summarizes the commanders' guidance and then presents his own. Effective COA development relies on intuitive decision-making and operational SOPs in order to meet the reduced timeline of R2P2. The COA brief may be presented to the CAT, the entire battlestaff, or only the ARG/MEU commanders.

COA Wargame. Once all of the COAs have been briefed, staff officers develop their staff estimates according to unit SOPs. To avoid any oversights, each staff officer uses a prepared matrix that lists each consideration relevant to their area of concern. Each staff member prepares an independent estimate of his area of expertise and includes each friendly COA's strengths and weaknesses, associated risks, and asset shortfalls as they apply to a warfighting function, staff section, or attachment.

COA Comparison and Decision. Commanders compare the COAs and rapidly reach a decision. The commanders may accept a single COA, modify a COA, or decide to execute something entirely different. In announcing their decision, the commander's provide their refined commander's intent and any additional guidance needed to finalize the plan.

Orders Development. The MEU S3 creates and delivers a written CONOPS in addition to other documents required by HHQ. To save time and ensure coordinated execution, the commander may not approve the completed final order until after the confirmation brief.

Transition. The commander approves the mission for execution immediately following the confirmation. The confirmation brief is the primary tool used to transition from planning to execution. The brief's purpose is to ensure those involved in executing the plan completely understand it and achieve situational awareness.

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AMPHIBIOUS OPERATIONS PLANNING CONSIDERATIONS

REFERENCES:

- a) MCWP 5-1, Marine Corps Planning Process
- b) MCWP 3-31.7/ NWP 3-62M, Seabasing
- c) JP 3-02, Amphibious Operations
- d) NTTP 3-02.1M/MCWP 3-31.5, Ship-to-Shore Movement
- e) MSTP 5-0, MAGTF Planner's Guide
- f) MCRP 3-31B, Amphibious Ships and Landing Craft Data Book

1. Introduction. This section contains a wide range of important amphibious operation planning considerations. **It is not meant to be a sole source for planning, but rather an overview.** Detailed planning considerations are contained within the specific applicable NWP, MCWP, NSTM, and naval instructions.

Regardless of the type of amphibious operation, the CATF and CLF plan and execute operations based on maneuver warfare philosophy and the following general concepts:

- All actions focus on achieving the commander's objectives.
- The sea is used as maneuver space. Operations should create freedom of action for the AF, while creating a tempo greater than the enemy can withstand.
- A key to successful AF operations is the ability to maneuver across the littorals to overcome area denial challenges, gain entry, and project power ashore as necessary.
- The preferred tactic for AFs operating against coastal defenses is to avoid or bypass the strong points and to exploit gaps in these defenses.
- The complexity of amphibious operations and the vulnerability of the AF as it builds combat power ashore require the full integration of organic assets as well as those of other joint and multinational forces.

2. Support for Amphibious Operations. This can be broken down into **intelligence, fire support, communications, logistics, protection, and seabasing**.

a. Intelligence. The following intelligence capabilities are required to support amphibious operations:

- Interoperable information systems that provide timely dissemination of information for amphibious planning, rehearsals, and execution.
- Information management systems to include C2 applications and collaborative information sharing to coordinate collection and dissemination efforts. These systems support information management plans, which should be integrated into and fully support mission requirements.
- Standoff collection assets capable of satisfying ATF and LF requirements from over the horizon.
- Intelligence dissemination systems linking widely dispersed forces afloat and ashore.
- Flexible intelligence assets capable of rapidly transitioning ashore with minimal degradation of support.

- b. Fire Support. Properly planned and executed lethal and nonlethal supporting fires are critical to the success of an amphibious operation. The LF normally requires fire support against shore targets before, during, and after the initial landings. Until ground fire support means (e.g., mortars, rockets, and cannon artillery) of the LF are landed and ready to provide support, fire support is provided by close air support, naval surface fire support, and, in limited cases, direct and indirect fires from adjacent friendly forces.
- c. Communications. Amphibious operations require a flexible communications system capable of supporting rapid decision making and execution to maintain a high tempo of operations. These systems must be reliable, sufficient for the mission, flexible, sustainable, survivable, and as expeditionary as the AF.
- d. Logistics. The CATF and the CLF have co-responsibility for determining overall logistic requirements for the AF. Those requirements that cannot be supported from resources available within the ATF are directed to the applicable Service component through the chain of command as established in the initiating directive.
- e. Protection. Protection of the AF is essential for all amphibious operations, but especially during ship-to-shore movement. The JFMCC will synchronize and coordinate operations between the AF and other forces (special operations forces and other naval and joint forces) to counter and neutralize enemy threats within the AOA to gain local maritime and air superiority.
- f. Seabasing. Operations from a sea base allow for rapid movement to the area of crisis and the buildup of combat power while in international waters without political restrictions. Some considerations:
 - The situation on the ground may require the CATF and CLF to minimize the forces ashore. Seabasing allows certain LF and ATF support functions to remain aboard ship.
 - With a sustainable logistics tail at sea, a sea base leverages the ATF's ability to operate from international waters, while providing support for the LF ashore.
 - Seabasing increases the maneuver options for LF ashore by reducing the need to protect elements such as C2 and logistic supplies.
 - Continuous sustainment of the sea base and the supported forces ashore requires logistic operations and plans personnel to consider implications across the range of logistics. Limited logistic support will be available to support other forces ashore that arrived in the operational area via means other than the sea base.

See NWP 3-62M/MCWP 3-31.7 Seabasing

3. Attributes and Supporting Characteristics. The following characteristics and attributes of amphibious ships generalize and underpin their greater contributions to operations at large and should be considered when planning amphibious operations by staffs.
 - a. Survivability. The ability of a ship to withstand damage and continue conducting its mission. The degree to which a ship needs to be able to anticipate and avoid, or need be, absorb, and recover from any damage is highly variable.
 - b. Breadth. The range of functions a given ship can support. One of the main contributions of amphibious ships is their inherently multi-mission capability. Because they typically carry embarked forces and some number of both aircraft and surface connectors, have sensors and weapons to defend against air, surface, and sub-surface threats, communications suites,

command and control (C2) systems, and intelligence surveillance, and reconnaissance (ISR) capabilities, amphibious ships provide commanders with multiple tools that can be either employed on their own or as part of a joint or combined force.

- c. Projection Capability. Projection is primarily defined by the capabilities and limitations of a ship's or Amphibious Task Force's embarked aircraft and surface connectors, but also relates to the ability of the ship or force to operate at range and sustain force ashore logistically. The degree to which various ships can enable sea-based operations ashore is a key distinguishing attribute in evaluating how much they contribute to the unique competencies of the Marine Corps.
- d. Responsiveness. The speed with which a given ship can deliver effects ashore once given a mission. How quickly various ships can fulfill those responsibilities is a function of a variety of factors, from where they are stationed, to the speed of the platforms themselves, to the operational status in which they are maintained.
- e. Persistence. The ability to remain in an operating area over time. Provided navy ships are replenished on a regular basis, navy ships can operate at sea indefinitely, but incur risk to mobility (propulsion plant reliability) if not afforded periodic inport time to conduct maintenance. Most deployed ships operate at an 85-90% at-sea OPTEMPO in Phase 0, but can surge as the situation dictates. While not important for every operation, persistence can be a critical attribute that must be considered while planning.

See Appendix A for more AO Planning Considerations

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DEFENSE OF THE AMPHIBIOUS TASK FORCE

REFERENCES:

- a) JP 3-02, Amphibious Operations
- b) NTTP 3.01.8/MCRP 3-25E, Multi-Service Tactics, Techniques, and Procedures for an Integrated Air Defense System
- c) NTTP 3-01.11, Maritime Air and Missile Defense Planning
- d) NTTP 3-02.1M/MCWP 3-31.5, Ship-to-Shore Movement
- e) NTTP 3-02.1.3, Amphibious/Expeditionary Operations Air Control
- f) TACMEMO 3-02.4-01, Airspace Control and Defense during Amphibious Operations
- g) MCWP 3-24, Assault Support

1. Introduction. Planning for the defense of the ATF requires a comprehensive understanding of the mission, threats and resources necessary to counter threats, and the operational and physical environment. Defense of the ATF planning is a constant process that calls for a balanced perspective of mission requirements and the threat to force.

2. Overview. **“The Navy uses the [composite warfare commander] CWC to defend the ATF at sea.”** JFMCC normally designates the CATF as CWC in the operational area.

The CWC uses the following five warfare commanders:

- (1) Air and missile defense commander (AMDC).
- (2) Antisubmarine warfare commander (ASWC).
- (3) Information operations warfare commander (IWC).
- (4) Strike warfare commander (STWC).
- (5) Surface warfare commander (SUWC).

In CWC doctrine, the strike warfare commander’s (STWC’s) primary function is to destroy or neutralize enemy targets ashore. This function overlaps with the duties of the supporting arms coordinator who supervises the SACC. **The SACC is where all AF maritime fire support is coordinated.** Within the SACC, the supporting arms coordinator and the LF’s force fires coordinator integrate supporting arms to effectively use fires to support the scheme of maneuver. Due to the significant overlap of responsibilities between the STWC and supporting arms coordinator, CATF may consider assigning both of these billets to the same individual.

3. Defense Areas. For an amphibious operation, a sea area is recommended by the CATF and designated by the establishing authority to minimize the possibility of interference between various elements of the AF and supporting forces. **The CATF designs all sea areas to support the amphibious operation.**

Amphibious Defense Zone. When an AOA is established, the airspace assigned to the AF usually includes a margin of airspace surrounding the AOA called the amphibious defense zone (ADZ). An ADZ is the area encompassing the AOA and the adjoining airspace required by accompanying naval forces for the purpose of air defense. The actual size and shape of an ADZ is dependent on the capabilities of air defense platforms assigned to the CATF; the size of the AOA. Within the ADZ, the appropriate AF air defense agency maintains positive identification of all aircraft and conducts air defense with the authority to engage in accordance with established ROE and AADC established procedures.

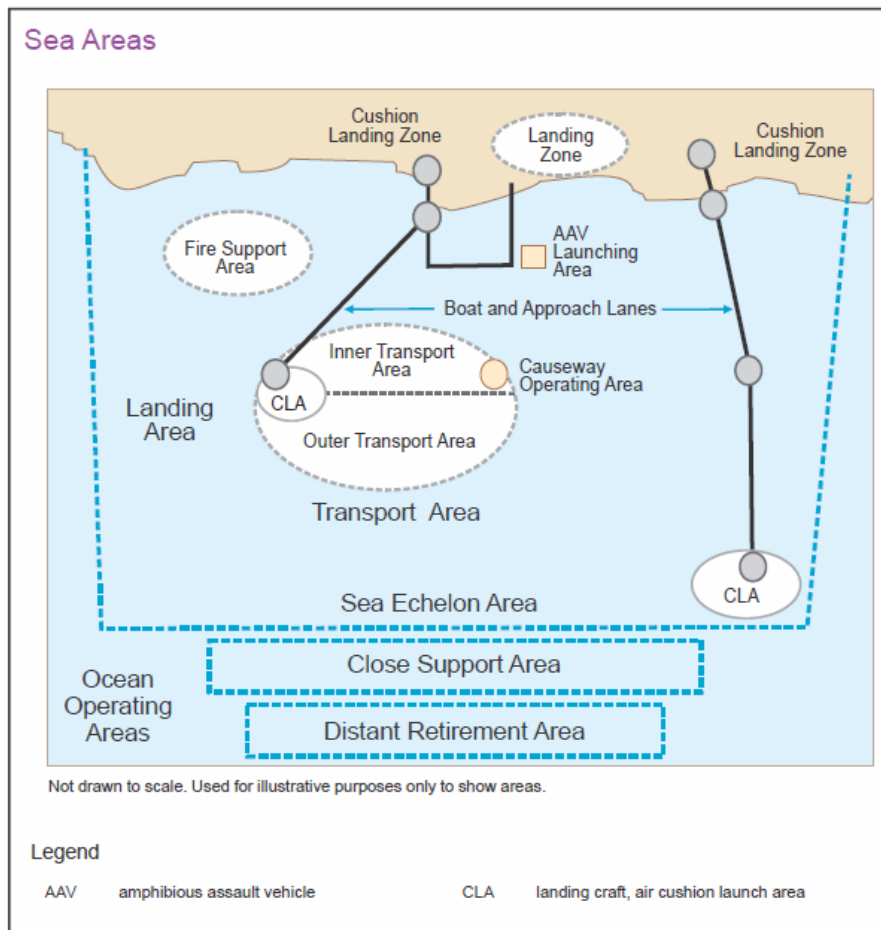


Figure 11.1

4. Surface Defense Considerations.

- Employ MH-60S detachment in defense of the ATF role.
- Stay as far to sea as possible until the ATF is required to close the beach. Only those ships required to close the beach should close.
- Ensure that CRUDES know the location of the boat lanes and the LCAC routes as well as the timetable of expected movement. The primary control officer should be in close contact with the surface warfare commander to increase his situational awareness.
- Enforce landing craft adherence to boat lanes/routes. If a craft approaches the ATF and it does not follow the specified boat lanes, it should trigger a PPR.
- Ensure LCUs and LCACs use IFF modes, including Mode 4.
- Ensure advanced amphibious direction system is operational and enhanced position locator reporting system is operational on all LCUs and LCACs. Coordinate with landing force operation center (LFOC) to maintain awareness of amphibious assault vehicles will be tracked via Blue Force Tracker/Joint Battle Command—Platform.
- Remain underway to increase maneuverability and to enable the ships to unmask batteries. Only when maritime supremacy is achieved, should ships be permitted to anchor.
- Use multifunction fuzes for the 5-inch rounds as these fuzes support air defense, surface defense targets (FAC/FIAC), and naval surface fire support.
- Turn on track history as a primitive means of conducting counterbattery fire.
- Be wary of a small craft (e.g., a fishing boat) that may have shoulder-mounted surface-to-air missiles.

- If possible, plan transits in high sea states as the fast inshore attack craft are less likely to press the attack.
- Coordinate with the Navy expeditionary force and special operations forces in theater. The Navy Expeditionary force provides maritime infrastructure security to include landward and seaward port and harbor security escort.

5. Air Defense Considerations. Air defense describes the action required to destroy or reduce to an acceptable level the enemy air threat.

Air Coordination Board

- Develop and publish specific procedures with regard to detailed control, lasso procedures, and other standard operating procedures (SOPs) relevant to defense of the ATF.
- Assist commanders with planning and scheduling assets for DATF as necessary.
- Recommend measures to resolve problems identified during DATF exercises and/or planning review.
- Be prepared to prioritize sorties, on-station times, and ordnance loadouts during high-risk missions (e.g., forced entry operations, strait transit, etc.) for DATF.

*Figure below denotes notation Warfare Commander’s Request for a Landing Force Aircraft

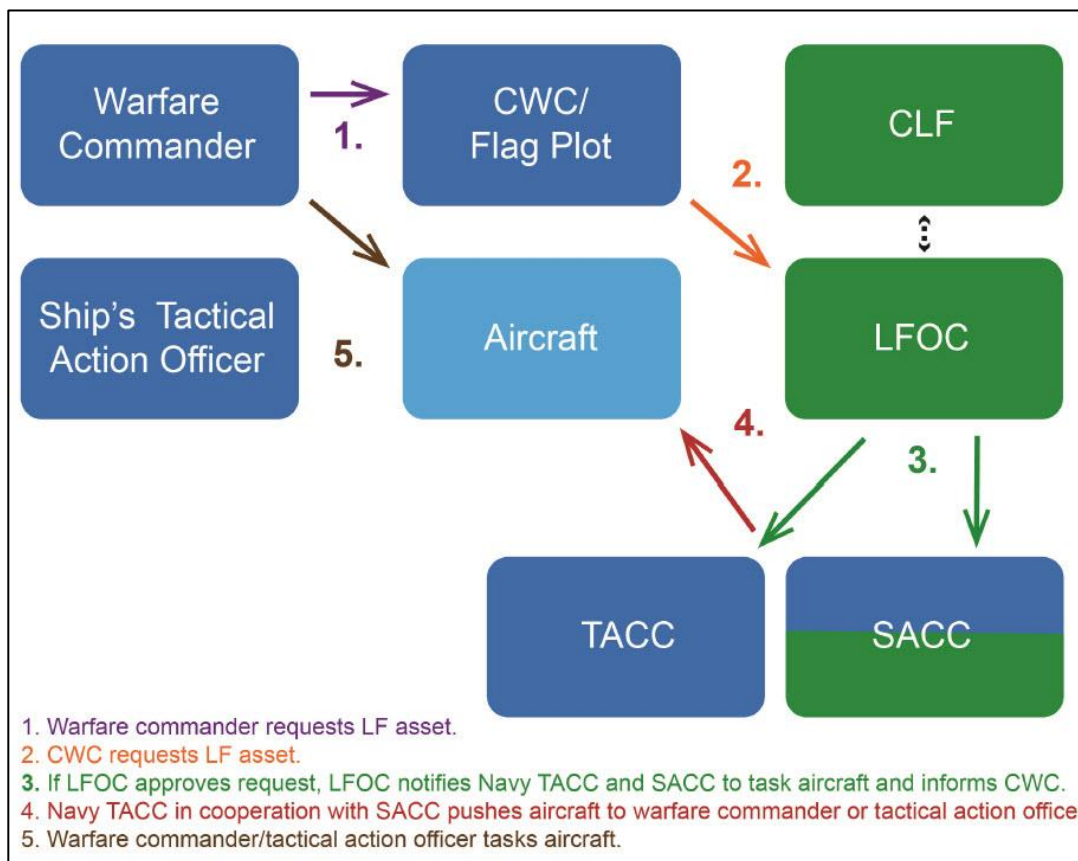


Figure 11.2
Notation ADC Request in CWC Construct

For overall planning, see NTTP 3-01.11, Maritime Air and Missile Defense Planning (formerly air defense planning guide). For single-ship defense, see TACMEMO 3-01.1-07, Single Ship Integrated Hardkill and Softkill Tactics in Anti-ship Missile Defense.

6. Amphibious Task Force Planning & Considerations. When allocating assets and assigning tasks, planners shall consider issues such as:

- Mission and acceptable risk.
- Rules of engagement.
- Prioritization of other missions/tasks.
- Availability of assets in the amphibious force.
- Availability of external assets.
- Environmental conditions.
- Flight deck availability and crew rest.
- Ordnance availability and weaponry.

See NTTP 3-02.1M/MCWP 3-31.5 Ship-to-Shore Movement

Review of the defense of the ATF should be part of the daily battle rhythm and include:

- Current operations and defensive posture, including training conducted and lessons learned.
- Intelligence/threat update (24/48/72-hour outlook).
- Forecast operations posture (24/48/72-hour outlook) and support requirements.
- Review of assets allocated to ATF and CLF missions.
- Review of asset availability for defensive tasking.
- Proposed modifications to the defensive posture.
- Final allocation recommendation(s) for defensive operational or training missions.

The primary source of defensive capability within an ARG comes from the LHA/D. Planners must understand the limitations of this platform to support aviation operations. LHA/Ds are generally limited to 10 hours/day for flight deck operations. Some considerations for planning:

- Arming the alert MH-60S.
- Cross decking some aircraft to the LPD so that when the LHA/D is not at flight quarters, the LPD can provide an available deck.
- Staggered flight windows of LPD and LSD.
- Extending flight deck hours.
- If an AV-8B or an F-35 is on Condition II/Alert 15, there cannot be other aircraft in front of the fixed-wing aircraft unless they are refueling, conducting a crew swap, or on a shorter alert.
- Spotting of aircraft affects the flight deck ability to launch aircraft for defense of the ATF.
- Shore-basing some aircraft to free up deck space.
- Effect of alert conditions on aircrew crew day.

Special consideration must be given to emergent re-tasking of assets (aviation, CRUDES, etc) to defend the ATF during the action phase of an operation. Plans and procedures must be developed and codified to ensure the smooth and timely re-allocation of assets to defend the ATF while in the AOA and clearly delineate the method by which assets are requested, authorized, re-tasked, and passed. In addition, the CATF's staff is not trained in ASW and amphibious warships do not have ASW sensors. In an ASW threat environment, CRUDES forces would need to be allocated to the ATF to provide ASW protection.

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MAGTF MANNING, LOGISTICS & REGULATIONS

REFERENCES:

- a) CNSL CNSP 4080.1G, LFORM Aboard Amphibious Warfare Ships of the US Atlantic and Pacific Fleets
- b) COMNAVSURFORINST 4621.1, Landing Force Spaces, SLCP, Troop Regulations and Amphibious Embarkation Documentation
- c) JP 3-02.1, Amphibious Embarkation and Debarkation
- d) MCRP 3-31B, Amphibious Ships and Landing Craft Data Book

1. Introduction. The embarkation of the LF on an L Class ship will require coordination in terms of logistics, accountability and regulations prior to, while, and after the LF is embarked.

2. Landing Force Operational Reserve Material (LFORM). LFORM assets are embarked aboard select classes of amphibious ships. These supplies and munitions may be utilized by any landing force embarked in support of contingency operations.

The LFORM package is assembled based on the requirements of a notional Marine Expeditionary Unit (MEU). LFORM is a package of contingency supplies pre-positioned on amphibious warfare ships consisting of Class I (rations), Class III (bulk and packaged ground petroleum, oils and lubricants (POL)), Class IV (field fortification/construction materiel), Class V(W) (ground ammunition), and Class V(A)(aviation ammunition, mission load allowance (MLA)).

Note: Every L-Class ship has the ability to carry different classes of LFORM supplies; with the LHD and LPD having a very specific LFORM supplement. **LFORM does not belong to the embarked MEU/SPMAGTF and may be utilized by any forward deployed unit (to include allies).**

See CNSL CNSP 4080.1G

3. Ships Loading and Characteristic Pamphlet (SLCP). SLCPs are provided by amphibious warfare ships to assist the landing force in embarkation planning. These pamphlets contain the ship's military lift characteristics in ready reference format and are based on the data in the ship's booklet of general plans, and the ship's present configuration as modified by authorized alterations.

An SLCP will be prepared for each amphibious warfare ship and will be published every 3 years from the date of publication of the last SLCP.

Note: SLCP's are the most important document a ship possesses in regards to familiarizing a LF with the ships characteristics and capabilities. **It clearly defines what spaces are designated "LF" spaces that should be available to the LF.** SLCP's are reviewed and signed **every three years** or anytime there is a major modification that affects any LF space. SLCP's are generally compiled by the ships CCO (1st LT of LSD Non Cargo) and routed thru the various ships departments for updating, prior to the ships CO signing. SCLPs must be reviewed by competent Marine leadership prior to agreement. Normally the SURFOR CCO will allow the affiliated Marine Expeditionary Force Command Element to review prior to Marine concurrence with the SLCP.

See COMNAVSURFORINST 4621.1, (ENC 5)

4. Troop Regulations. Each amphibious warfare ship shall have regulations for embarked troops. These regulations will be published by each ship as a ship's instruction every 3 years from the date of publication of the last Troop Regulations or anytime there is a major change to policy or procedures.

Note: Troop Regulations go hand in hand with the SLCP in painting a word picture for the ship requirements. Troop Regulations cover things that may or may not be found in the SLCP but are deemed vital to successful integration onto the ship. Things covered may include “Blue/Green” meal hours, Uniform of day requirements, gym attire requirements, etc.

See COMNAVSURFORINST 4621.1

5. Commander of Troops/Executive Officer of Troops (COT/XOT). Since personnel of several different organizations may be embarked in the same ship, it is necessary for administrative purposes to designate an officer as commander of all embarked troops. While embarked, the COT is responsible for the administration, discipline, and training of all embarked personnel. COT deals directly with ships CO when respective subordinates can't resolve an issue.

Executive Officer of Troops. Works directly with the ships XO and Combat Cargo Officer as the representative of the COT.

Note: XOT should be encouraged to attend 8 O'clocks and PB4T to ensure ship is aware of training requests/requirements.

See JP 3-02.1 Amphibious Embarkation and Debarkation, CH3.34

6. Combat Cargo Officer (CCO). All L- Class amphibious ships (minus LSD Non Cargo variant) will have a Marine Combat Cargo Officer and Combat Cargo Assistant assigned to the ships company. The CCO/CCA exists to assist the Ships Commanding Officer in matters related to Landing Force issues as well as “Green Space” oversight when a LF is not embarked on the ship. The Marines work directly for the ships CO/XO and are part of the ships staff.

7. Pre-Embarkation Shipboard Accommodations Inspection Report (PESAIR). A Landing Force representative will conduct the Pre-Embarkation Shipboard Accommodations Inspection of landing force spaces; accompanied by the ship's designated representative(s), regardless of length of time embarked aboard ship.

This inspection will be conducted 30-45 days prior to embarkation for exercises, and 60-75 days prior to embarkation for scheduled deployments.

All existing discrepancies and/or damages must be noted on a compartment checklist; one checklist will be used for each compartment inspected. Once a compartment has been inspected, the landing force representative will sign the compartment checklist; acknowledging acceptance of the space in an “as-is” condition.

The ship's company representative will also sign the compartment checklist as acknowledgement

of the pre-existing conditions and or deficiencies noted during the conduct of the inspection.

Note: The PESAIR is a document used by the LF to address noted discrepancies in all LF spaces. This report should serve as a priority checklist for ship's crew to either request maintenance or for the ship's crew to repair.

See COMNAVSURFORINST 4621.1, (ENC 12)

8. Debarkation Shipboard Accommodation Inspection Report (DESAIR). The ship's designated representative will conduct the Debarkation Shipboard Accommodations Inspection Report (DSAIR) of Landing Force spaces prior to the final debarkation/offload of the Landing Force, accompanied by the LF designated representative.

All existing discrepancies and/or damages must be noted on the compartment checklist. Once a compartment has been inspected, the Landing Force and ship's force representatives will sign the compartment checklist. Unless otherwise indicated or annotated on the compartment checklist, the designated representative signature reflects acknowledgment of the discrepancies and/or damages that existed at the time of the inspection.

The signature of the Ship's CO's acknowledges acceptance of the space in an "as-is" condition. The report will cover the entire deployment and include as much detail as needed to document potential damage claims that may arise. The report and all appropriate chain of command endorsements should indicate whether or not the Navy and Marine Corps parties agree with the discrepancies noted and plan for monetary reimbursement. In those cases when an agreement as to funding responsibility cannot be reached at the ship and troop level, detailed reports will be sent via each unit's chain of command for resolution/adjudication.

Note: **A comparison between the PESAIR and DESAIR will be the main source for a ship to seek monetary reimbursement from the LF.** Failure to complete and route a detailed DESAIR in the allotted time will make seeking reimbursement very difficult.

See COMNAVSURFORINST 4621.1, (ENC 12)

9. Naval Support Element Augmentation (NSEA). The NSEA message is submitted by CATF to CLF via naval message. This message is used to identify the personnel, supplies, and equipment to be embarked by each Naval Support Element (NSE) and CATF's intent relative to the assignment of these elements to specific ships.

Note: Message is generally released at the CPR level and is used to quantify naval forces that may be required to billet in LF spaces. These organizations are not part of the normal ship's crew and are in direct support of amphibious operations. Often times the LF is not aware of outside organizations and will not account for their personnel or equipment. Examples include: BMU, ACU, and TACRON.

See COMNAVSURFORINST 4621.1, (ENC 8)

10. Organization Equipment Assignment to Shipping (OEA&S). The OEAS is submitted by CLF to CATF by naval message and will define what specific units and specific equipment will be embarked on the various ships.

See COMNAVSURFORINST 4621.1, (ENC 9)

11. Load Plans. Detailed load plans should be completed and submitted by the landing force. Load plans need to account for all landing force vehicles and cargo. Completed load plans need to

be briefed to and signed off by the ships CO. Usually the CCO, 1st LT and DCA review the load plans for supportability with the ships CO.

See JP 3-02.1 Amphibious Embarkation and Debarkation, CH3.20

12. Simultaneous Flight Deck/Well Deck OPS. Depending on the class of ship simultaneous operations are a routine function during amphibious operations. Caution must still be given to ensure ship is in favorable winds to launch/recover aircraft. While conducting simultaneous operations aircraft flight over landing craft is prohibited and should be avoided. While the capability is the same for LSD variant ships, manning generally prohibits the ability to conduct simultaneous operations for a sustained timeframe.

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NAVAL SURFACE FIRE SUPPORT

REFERENCES:

- a) FXP 5 (Rev B.), Amphibious Warfare (AMW) Exercises
- b) NWP 3-09.11M, Supporting Arms in Amphibious Operations
- c) ATP 4, Allied Spotting Procedure for Naval Gunfire Support
- d) COMNAVSURFPACINST 3500.11, Surface Force Exercise Manual, Appendix B
- e) NTTP 3-02-2, Supporting Arms Coordination in Amphibious Operations
- f) NTTP 3-60.2, Maritime Dynamic Targeting

1. Introduction. Naval Surface Fire Support Qualification: This qualification trains and evaluates a ship's NSFS team in proper NSFS procedures. It provides a realistic, advanced hands-on training and certifies the ship's NSFS team to complete practical Naval Gunfire (NGF) mission and scenarios.

2. Doctrines, Procedures, and Principles

- a. The primary mission of naval surface fires is, in conjunction with air and artillery, to support the LF accomplishment of the objective and defense of friendly forces by:
 - (1) **Pre-D-day** — Destroying or neutralizing shore installations or platforms that oppose the approach of ships and aircraft to the objective area
 - (2) **D-day** — Destroying or neutralizing defenses that may oppose the landing
 - (3) **Post-D-day** — Destroying or neutralizing defenses that oppose the advance of the LF.

See NTTP 3-02-2 Supporting Arms Coordination in Amphibious Operations, CH 4.7.2

b. Capabilities

- (1) Mobility. NSFS units can readily move from place to place while retaining the ability to fulfill primary missions. Specifically, they can position or reposition to best support the LF and maneuver to avoid counterbattery fire. Also, they are limited only by hydrographic conditions, are able to select the most favorable gun-target line (GTL), and can support widely separated beaches.
- (2) High rate of fire. If/when sufficient assets are available; NSFS delivers large volumes of precisely delivered ordnance on target in a relatively short period of time. A high rate of fire is particularly advantageous when delivering neutralization fires.
- (3) Flat trajectory. This enables an accurate attack of recessed forward slope targets particularly those presenting a vertical face.
- (4) Narrow deflection. This allows effective fires on narrow, long-axis targets parallel to the GTL. Narrow deflection can also enhance close support if the GTL is parallel to the front lines of the LF.
- (5) Ordnance variety. This capability allows the spotter to select the most effective combination for the target being engaged.
- (6) Computerized gunfire control system (GFCS). These allow ships to fire accurately when underway. They provide a quick reaction time, and ships can observe targets under favorable conditions, thereby permitting direct fire.

- (7) Ammunition replenishment. NSFS ships' ability to conduct underway replenishment (UNREP) and vertical replenishment (VERTREP) enhances their ability to remain underway and prepared to carry out assigned missions.
- (8) Prolonged support. The ships are capable of remaining on station for a prolonged period of time to support advanced force operations, the actual landing, and subsequent LF movement to the objective.

See NTTP 3-02-2 Supporting Arms Coordination in Amphibious Operations, CH 4.7.2.2

c. Limitations

- (1) Ability to accurately fix ship's position. This is vital to achieving an accurate fire control solution in unobserved fires and initial salvos of observed indirect fires. To compensate for a possibly inaccurate ship's fixed position radar beacons, radar navigation or GPS may be used.
- (2) Ineffectiveness against defilade targets. High initial velocity and flat trajectory preclude destruction missions on entrenched targets. To compensate, ships reposition for a more favorable gun target line (GTL) or use reduced propellant charges and/or high-angle fire. Also, airbursts may be used to neutralize or interdict the target.
- (3) Excessive range dispersion. This may occur due to an initial salvo error caused by spotter error in target location and/or the ship's error in navigation. It may also occur if a prohibitive number of rounds are needed to engage point targets on flat terrain. Also, close supporting fires are not always possible, particularly when firing perpendicular to friendly troop lines where greater safety margins are required.
- (4) Hydrography. Ships require room to maneuver; however, those assigned to provide fire support are often a victim of self-imposed restrictions (e.g., Fire Support Area (FSAs)). Moreover, shallow water and the presence of reefs, sandbars, mines, and other obstacles may force the ships into undesirable firing positions.
- (5) Changing GTL. This problem may eventually lead to a masked target situation or firing perpendicular to front lines, which may cause cancellation of the fire mission.
- (6) Weather and visibility. Unfavorable weather may limit a ship's ability to navigate with sufficient accuracy. Also, unfavorable weather or visibility adversely affects the ability of NSFS spotters ashore to acquire targets and adjust fires.
- (7) Magazine capacity. The Ticonderoga-Class cruiser carries approximately 600 rounds per magazine. The Arleigh Burke-Class destroyer carries between 500-550 rounds in a single magazine.
- (8) Communications. All NSFS communications are conducted via voice radio, which is susceptible to degradation. The possibility of communications difficulties exists due to equipment failure, enemy jamming, poor atmospheric conditions, or ship or shore party movement. Techniques used to overcome these problems include having backup equipment available and conducting training in anti-jamming techniques.

See NTTP 3-02-2 Supporting Arms Coordination in Amphibious Operations, CH 4.7.2.

- d. Target Location. Combat charts have a common grid. The Universal Transverse Mercator (UTM) grid system is ordinarily used except in latitudes greater than 84 degrees. The UTM grid system divides the charted area into squares (1,000 meters to a side) that are used for target designation.

See FXP 5 (Rev B.), Amphibious Warfare (AMW) Exercises, CH 5.1.3

- e. Maneuvering. Steam at the lowest speed practicable that allows good control of the ship and that the tactical situation permits.

See FXP 5 (Rev B.), Amphibious Warfare (AMW) Exercises, CH 5.1.7

3. Live Firing Exercise Safety Precautions

Common Errors

a. Preparation

- (1) Pertinent details of operation orders, firing plans, etc., were not made known to each individual concerned.
- (2) Preparatory drills and exercises were not conducted.
- (3) Lack of sufficient understanding of all phases of NSFS by key personnel.
- (4) Failure to make a detailed study of charts and maps to be used prior to firing.
- (5) Pre-fire checks were not completed.
- (6) Battery was not aligned.
- (7) WRN-6 not properly set up.

b. Communications

- (1) Internal communications — Insufficient exchange of target information between stations.
- (2) External communications—Improper radiotelephone procedure.

c. CIC Operator

- (1) Incorrect reading of ranges. Reading range from wrong side of scale on the parallel motion protractor (PMP) arm.
- (2) Failure to align PMP arm with true north-south line of chart. (PMP are never aligned with gridlines.)
- (3) Incorrect bearings. Reciprocal bearings or bearings 10 degrees in error.
- (4) Wrong order of coordinates. NS and EW grid coordinates given to gun console operator in reverse order.

d. Gun Console Operator

- (1) Spots were applied in wrong direction.
- (2) Observer-target line was entered incorrectly or omitted.
- (3) Incorrect ammunition type was selected.
- (4) Environmental data (wind speed, etc.) were not updated regularly.
- (5) Firing without command from observation post.
- (6) Deflection and/or elevation spots from direct fire (ship's) spotter entered in meters rather than mils.
- (7) Chart offsets not entered.

See FXP 5 (Rev B.), Amphibious Warfare (AMW) Exercises, CH 5.2.5

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Appendix A. Amphibious Operations Planning Considerations Continued

1. Primary Decisions (JP 3-02, Ch 3)

AF commanders make certain primary decisions during the planning process before further planning for an amphibious operation can proceed. The decisions and who makes them are described below and, in some cases, these decisions may have been made by the establishing authority and promulgated in the initiating directive. **In the case of mutual decisions, both CATF and CLF must concur, or the decision is referred to the CAF or establishing authority for resolution.**

- Determine AF mission(s)
- Select AF objective(s)
- Select COA
- Select date and hour of landing
- Select method of entry
- Select Landing Areas
- Select Landing Beaches
- Determine Sea Echelon plan
- Select Landing Force objectives
- Select Landing and Drop zones

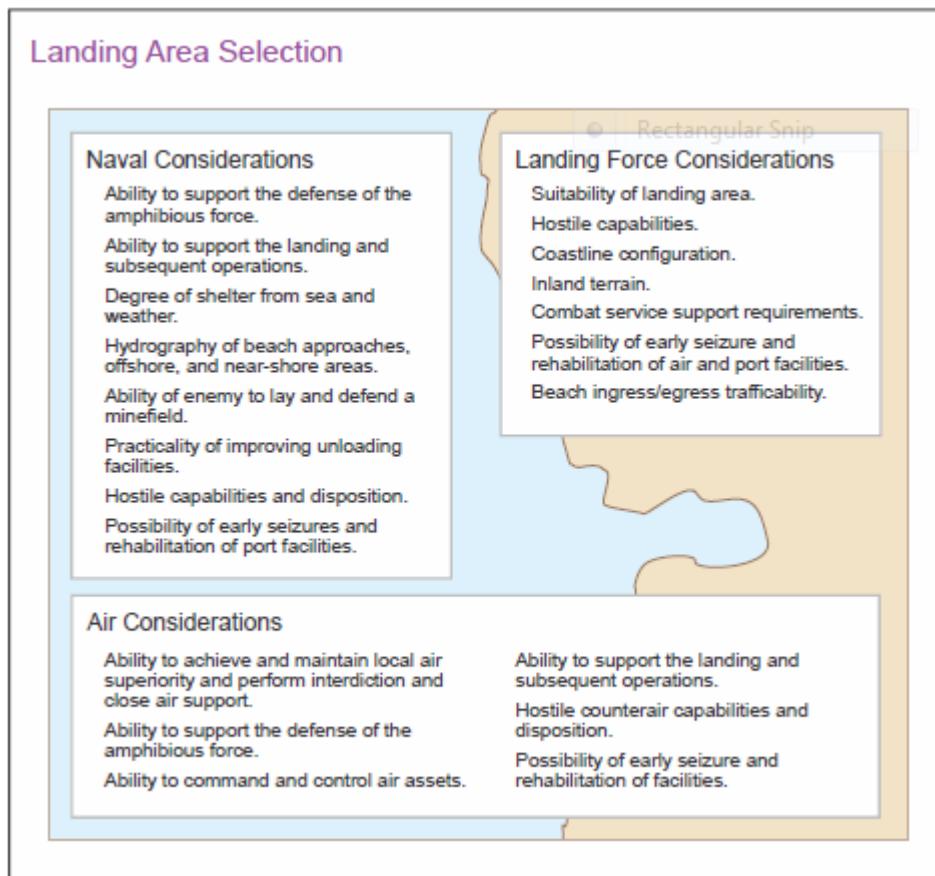


Figure 12.1
Decision Summary

Landing Timing Considerations

Date for Landing

- Availability of forces.
- Readiness of forces.
- Present and projected enemy situation.
- Seasonal conditions in the area under consideration.
- Local conditions of weather, tide, current, phase of moon (duration of darkness and daylight).
- Designation of limiting dates by a higher authority.
- Coordination with preliminary operations.
- Advantageous use of religious or cultural events in the area under consideration.

Hour for Landing

- Known enemy routine.
- Duration of daylight.
- Need for tactical surprise.
- Concept of operations ashore of the landing force.
- Favorable conditions of wind, tide, and phase of moon.
- Requirements for conducting certain operations during hours of darkness.
- Most effective employment of supporting arms.
- Immediately after certain countermine or assault breaching operations.
- Need for simultaneous landing of surface and helicopter borne forces.

Figure 12.2

2. Operational Environment (JP 3-02, Ch 3)

Amphibious operations will likely be planned and executed based on one of three operational environments: permissive, uncertain, or hostile.

- **Permissive Environment.** In a permissive environment, host country military and law enforcement agencies have the control, intent, and capability to assist operations that a unit intends to conduct. When conducting operations in a permissive environment, personnel and equipment going ashore are still considered an LF but are not normally referred to as such due to the cooperative nature of their missions.
- **Uncertain Environment.** In an uncertain environment, host government forces, whether opposed to or receptive to operations that a unit intends to conduct, do not have totally effective control of the territory and population in the intended operational area.
- **Hostile Environment.** In a hostile environment, hostile forces have control, intent, and capability to effectively oppose or react to the operations a unit intends to conduct.

Regardless of the size or nature of the mission, the organization, capabilities, and techniques required to conduct large-scale amphibious assaults in a hostile environment provide the basis for adaptation to conduct the other types of amphibious operations.

Appendix A. Amphibious Operations Planning Considerations Continued

3. Sea Routes (JP 3-02, CH 3)

Sea route selection should take into consideration the missions of various task forces, groups, units, and elements in the AF so they may proceed expeditiously to their assigned stations without interference. Small-scale charts, which show sea routes and route points, are prepared and included in the OPLANs and OPORDs of appropriate ATF echelons. All sea routes should be wide enough for transport and movement group commanders to maneuver the group without interfering with the movement of other groups.

Sea routes and en-route points TO the operational area should:

- Lead from all possible ports of departure to the operational area.
- Alternate routes should also be provided to avoid interference between forces and to permit execution of alternate plans should the threat of enemy attack or weather prevent use of primary routes.
- Be named to facilitate reference.

Sea routes IN the operational area should be selected that:

- Provide a minimum of interference among ships and formations.
- Provide areas clear of mines and navigational hazards to the maximum extent possible.
- Provide sufficient dispersion to prevent concentrations that would make the AF a desirable target for CBRN attack.
- Provide for economy of screening forces to provide protection from air, surface, subsurface, and land based threats.

4. Staging Areas (JP 3-02, CH 3)

The CATF, in consultation with the CLF, may decide to use staging areas while en-route to the operational area. The AF may stage at one or more intervening ports for logistic support, emergency repairs, or final rehearsals. The CATF will select the staging area. Considerations include:

- Availability of repair facilities and service craft.
- The distance of the staging area from the landing site should minimize both risk of logistics delay and interdiction.
- Anchorages are assigned to facilitate entry and sortie of transport and movement groups staging through the area while avoiding vulnerable concentrations.
- Suitable areas are available to conduct rehearsals.
- Provision is made for replacement or repair of critical supplies or equipment expended or damaged during rehearsal.

5. Approach to the Operational Area (JP 3-02, CH3)

Approach to the operational area includes the arrival of various task groups in the vicinity of the operational area. These forces aggregate as necessary according to assigned tasks and proceed to designated positions in the operational area. During this critical period, additional protective measures may be necessary. These measures may include:

- Counterair measures, including air strikes against enemy airfields within range of the landing area.

Appendix A. Amphibious Operations Planning Considerations Continued

- Location and neutralization of enemy submarines, surface craft, minefields, and land-based threats that can interfere with the approach.
- Selection of approach routes that avoid lengthy exposure to fire from enemy land-based threats.

6. Ship to Shore Movement (JP 3-02, CH3)

The CATF, in close coordination with the CLF, is responsible for the preparation of the overall ship-to-shore movement and landing plan. During execution of the amphibious operation, CATF has overall responsibility for ship-to-shore movement but will coordinate with the CLF to adjust for changing situations as revealed by intelligence sources or LFs ashore. The CATF is also responsible for debarkation until termination of the amphibious operation, at which time the responsibilities for off-load of the AFOE and follow-up shipping and LOTS operations may be passed to another organization designated by higher authority. In the case of an amphibious assault, the operation will normally be terminated only after the entire AFOE is ashore.

Considerations for ship-to-shore movement planning include the following:

- Tactical integrity of the LF enables unity of command and execution of proven TTP during amphibious operations. The organization for landing should closely mirror the tactical formations of the LF and allow for adequate C2 for the respective commanders. As much as feasible, the LF should embark on assigned shipping, landing craft, and helicopters along normal organizational lines. However, for the fastest off-load, consideration should be given to spreading the unit to more than one ship.
- Available amphibious warfare ships and landing craft. The type and quantity of amphibious warfare ships, landing craft, small boats, and amphibious vehicles used for the ship-to-shore movement will influence every aspect of the planning and execution of the operation. The inherent capabilities and characteristics of available ATF assets play a role in the development of the LF CONOPS.
- Ship and landing craft cycle time. The ship's flight deck and well deck are limited in the length of hours they can operate. Further, for large-scale operations, the ships may be cycled into the inner transport areas for the most expeditious off-loading. Generally, not all ships can be in the inner transport areas at the same time.
- Required degree of dispersion of ships, to include contemplated employment of a sea echelon plan.
- Protection of the AF is a matter of mutual concern to the CAF, CATF, and CLF. Coordination of the use of LF assets (e.g., aircraft, antiaircraft missiles, crew-served weapons, ground-based air defense assets) to support the defense of the ATF may be required. Protection comprising both active and passive measures should be provided during all phases of the amphibious operation but particularly during the vulnerable period of ship-to-shore movement. The increasing threat from precision-guided munitions must also be considered. Active protection includes defensive counterair operations, ASW and anti-small boat screens, covering forces, electronic countermeasures, offensive counterfires, obscuration, defeat of WMD delivery systems, and NSFS. Passive protection places major emphasis on dispersion and mobility.

Flexibility. The ship-to-shore movement plan should have sufficient flexibility to exploit adversary vulnerabilities that may become apparent after the commencement of

Appendix A. Amphibious Operations Planning Considerations Continued

the landing.

- Availability and planned utilization of supporting arms.
- Need for speed and positive centralized control.
- MCM and obstacle reduction requirements including assault breaching operations in the SZ and on the beach.
- Go/no-go criteria.
- Hydrographic conditions.
- Recovery and salvage of amphibious vehicles and landing craft.

The ship-to-shore movement planning sequence (see following figure) is a coordinated effort between the ATF and LF. The planning of the ship-to-shore movement is an iterative process.

The LF scheme of maneuver may affect the assignment to shipping. This iterative planning process between CATF and CLF will ensure the best load out and the best ship-to-shore plan that considers the air and surface plan, the A2/AD threat, the number of landing craft that need to be embarked, etc.

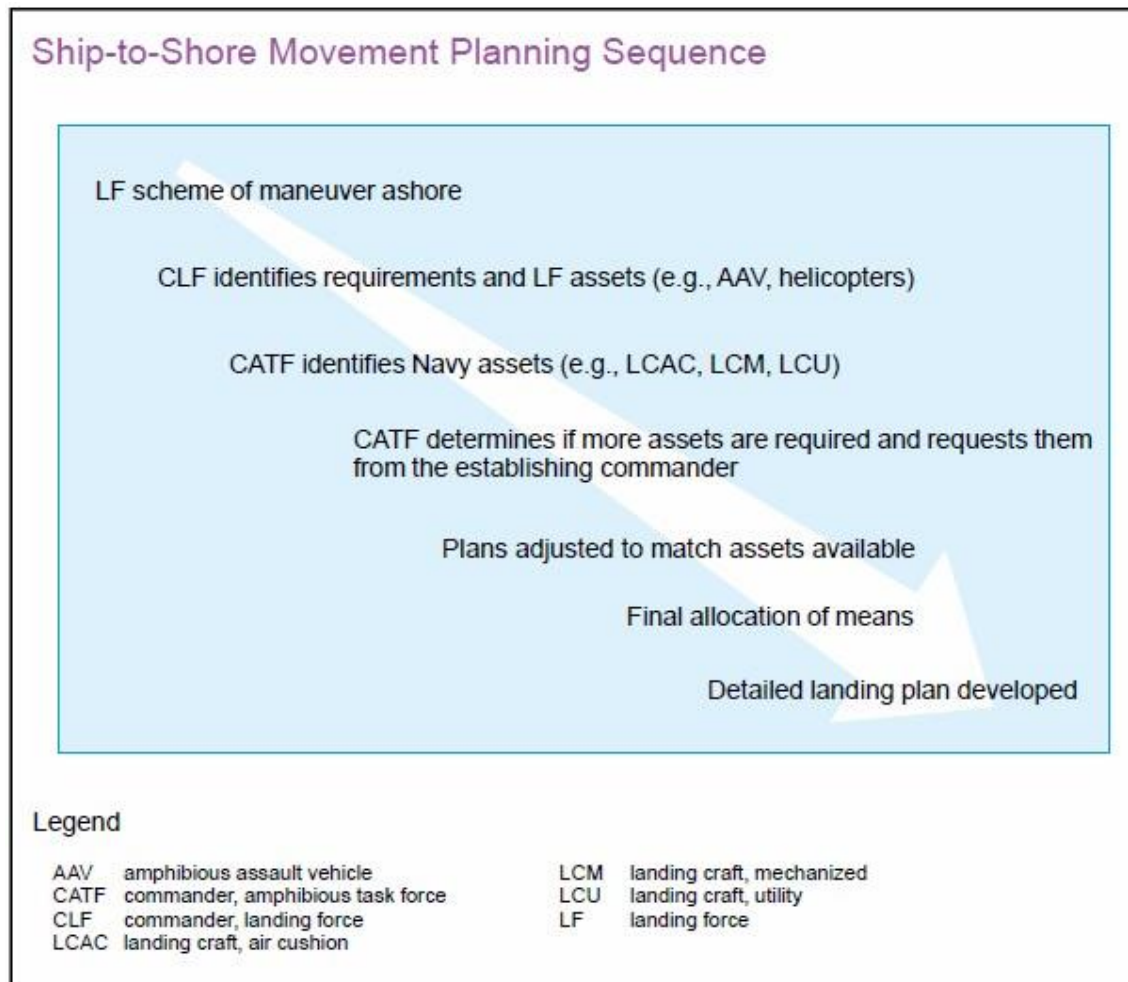


Figure 12.3

Specific planning considerations for surface borne ship-to-shore movement are:

- OTH or near shore launch
- Surface craft availability and crew status

Appendix A. Amphibious Operations Planning Considerations Continued

- Location of landing beaches and CLZs
- Only surface borne or combined with airborne
- Amphibious and combatant ship dispersion
- Composition and timing for displacement and non-displacement landing craft
- LF tactical integrity, and achieving the degree of troop and equipment concentration or dispersion
- Threats to and protection available to the AF
- MIW threat, and MCM units and time available for clearance
- Availability and planned utilization of supporting arms
- Establishment of go/no-go criteria
- Need for speed and positive centralized control
- Need to maintain sufficient flexibility to allow exploitation of adversary weaknesses
- Anticipated weather, sea state, and tidal conditions
- Adversary disposition and barriers, or other natural or manmade obstructions in the vicinity of the landing beaches and CLZs
- EMCON requirements

Specific planning considerations for airborne ship-to-shore movement are:

- The role of vertical lift in the LF CONOPS.
- Quantity and types of vertical lift available.
- Numbers of aviation-capable ships available that can operate AND maintain aircraft, and those that can only operate aircraft.
- Location, nature, number, and size of VLZs and their approach and retirement lanes.
- Capabilities and dispositions of any opposing forces, especially location, type, and density of any anti-aircraft weapons.
- Requirements for supporting arms, linkup, and CSS.
- Oceanographic or weather influences such as:
 - Suitability of sea state for launch and recovery.
 - Weather conditions to be encountered at launch and recovery, en route and at the HLZ. This includes ceiling, visibility, icing, and turbulence.
- Availability of alternate plans for landing serials scheduled for airborne waves aborted during the landing.

When vertical lift is included in the landing plan, support requirements to consider are:

- Ships having refueling and rearming capabilities should be considered when establishing refueling or rearming cycles.
- When practicable, decks should have no less than two spots to maintain flight section integrity.
- As the assault or action progresses, FARPs may be established ashore by the LF.
- Provisions for downed aircrew and aircraft should be included in the LF OPORD.
- Requirements for deploying HSTs in LZs.

For additional information on employment considerations, see NTTP 3-02.1M/MCWP 3-31.5, Ship-to-Shore Movement; NWP 3-02.12/Marine Corps Reference Publication 3-31A, Employment of the LCAC; MCWP 3-12, Employment of Amphibious Assault Vehicles (AAVs); and Navy Tactical Reference Publication (NTRP) 3-02.1.2, Naval Beach Group Support Element Operations.

7. Over the Horizon Operations (JP 3-02, CH3)

While OTH techniques are applicable to any type of amphibious operation, special considerations are required. An OTH operation requires that the landing plan be fluid, containing alternate beaches and LZs that may even be selected while landing craft are in transit. Operational requirements for planning an OTH amphibious operation should:

- Develop and maintain an accurate and timely tactical picture of the operational area. The need for timely intelligence data is increased for OTH operations because the number of possible landing sites is increased. The afloat tactical picture, as it pertains to the presence or absence of enemy naval forces between the ATF and shore, plays a significant role in the selection of possible landing sites and, therefore, affects the scheme of maneuver. Using OTH tactics requires consolidation of the tactical picture of land and water to provide the CATF and CLF with a consolidated base from which to plan and make tactical decisions. Interoperable C2 systems for maintaining situational awareness and a common tactical picture for the CATF and CLF are absolutely essential in OTH operations.
- Conduct surveillance and reconnaissance of the operational area with emphasis on possible landing sites. Positioning the AF OTH allows the landing site location to remain flexible. Landing sites may be chosen just before launching the first wave.
- Reliable communications and accurate navigation. OTH operations planning is more complex than traditional amphibious planning due to the increased distances between launch platforms, landing beaches, supporting fires, and control platforms. This in turn requires greater coordination and communications capability. Flexibility must be maintained throughout the operation since LZs and CLZs may be widely separated. The vertical assault may land forces inland where they will be able to threaten key enemy positions, facilities, and lines of communications (LOCs).
- NSFS may be a requirement for successful prosecution of an amphibious assault. However, since one underlying reason for an OTH assault is the strength of coastal defenses, the primary mission of NSFS may shift from destroying enemy forces at a defended landing beach to isolating the landing area(s). Pre-landing fire support in the vicinity of landing sites may also be restricted, especially prior to D-day and H-hour, to preserve tactical surprise. NSFS ships may initially be OTH with the ATF, closing the beach with the initial waves of landing craft. Although these ships can use land attack missiles for OTH fire support, their quantities are limited.
- OTH distances may be so great that the LCUs may not be able to be used except for the scheduled waves.
- If the amphibious operation is planned to be OTH, then more landing craft should be embarked.
- If the amphibious operation is planned to be OTH, then the AAVs may not be able to swim to the shore and thus, the LF will not be initially mechanized.

For information on transporting troops and cargo on landing craft, see JP 3-02.1, Amphibious Embarkation and Debarkation. For additional information on employment considerations, see NTTP 3-02.1M/MCWP 3-31.5, Ship-to-Shore Movement; NWP 3-02.12/Marine Corps Reference Publication 3-31A, Employment of the LCAC; MCWP 3-12, Employment of Amphibious Assault Vehicles (AAVs); and Navy Tactical Reference Publication (NTRP) 3-02.1.2, Naval Beach Group Support Element Operations.

Appendix A. Amphibious Operations Planning Considerations Continued

8. Chemical, Biological, Radiological, and Nuclear Environments (JP 3-02, CH3)

Planners should maintain a clear understanding of potential CBRN threats and hazards within their operational area and include measures to minimize associated AF vulnerabilities.

Countering WMD plans may include provisions for the following:

- Requests for supporting operations to eliminate or reduce an adversary's CBRN capabilities within the operational area prior to the arrival of the AF.
- Plans for amphibious advance force operations to further degrade an adversary's CBRN capabilities and to detect contaminated areas that may interfere with the CONOPS.
- Offensive and defensive preparations taken by the AF to minimize the vulnerability to and mitigate the effects of CBRN attacks.

For additional information on individual protection, see JP 3-11, Operations in Chemical, Biological, Radiological, and Nuclear Environments, and NTTP 3-20.31, Surface Ship Survivability.

9. Electromagnetic Spectrum Management and Cyberwarfare (JP 3-02, CH3)

The proper execution of joint electromagnetic spectrum (EMS) management operations enables the commander to command and control forces, gather intelligence, execute both lethal and nonlethal fires missions, conduct movement and maneuver, and protect and sustain the force.

The CATF and CLF should conduct an operational assessment of the impact of sacrificing one potentially critical capability in order to use another. The AF should resolve electromagnetic interference daily. EW planners should coordinate their planned activities with other activities that may use the EMS.

Many aspects of modern amphibious operations depend upon secure access to cyberspace. The AF's JIPOE should address the capabilities and limitations of an adversary's offensive and defensive cyberspace operations capabilities. The AF commanders should consult with US Cyber Command to plan for the full extent of available actions to create the desired effects needed against an adversary employing cyberspace capabilities.

10. Shaping the Operational Environment (JP 3-02, CH3)

Prior to the execution of the action phase of an amphibious operation, the CAF seeks to shape the operational environment. Shaping operations include supporting and pre-landing operations. Supporting operations are conducted to establish the requisite conditions for an amphibious operation (e.g., establishment of air and maritime superiority) and may include:

- Initiation of MCM operations.
- Hydrographic reconnaissance.
- Meteorological and oceanographic.
- Geospatial intelligence products to include tailored imagery, imagery intelligence, maps, charts, and oceanographic data.
- Sea-based and land-based supporting air operations to establish air superiority, conduct reconnaissance, and attack of land targets.
- Assault breaching.

Appendix A. Amphibious Operations Planning Considerations Continued

- SOF operations, including military information support operations, civil military operations, FHA, special reconnaissance, and direct action.
- Reconnaissance and surveillance of AF objectives, LF objectives, landing beaches, LZs, DZs, and high-speed avenues of approach into the landing area.
- Neutralization or destruction of adversary high-value assets.
- Deception operations to confuse the enemy as to the location of the landing area, or to the future intentions of the AF.
- Operations that may induce the enemy to expose their A2/AD systems and plans.
- Air interdiction.
- Underwater demolition.

The decision to employ a supporting force is made after weighing the advantages of operational and tactical surprise and the requirements for preparation of the landing area. Knowledge of the operational area, the indigenous population, extent of adversary fixed defenses, air defenses, mines, and obstacles should be evaluated.

Some of the planning considerations for pre-landing operations include:

- Demolition of visible obstacles, clearance of required mines, breaching of any remaining seaward minefields and barriers to and on the beach, overt marking of usable channels, direct action missions, target acquisition (TA) and spotting for NSFS, and initial terminal guidance for designated assault landings.
- Air operations in accordance with air support plans, including EW, and preplanned air strikes against adversary installations en route to and in the vicinity of beaches, DZs, LZs, targets of opportunity, and mines and obstacles in the SZ and on the beach.
- NSFS in accordance with the NSFS plan, including destruction or neutralization of adversary installations that might interfere with the approach and final deployment of the AF or otherwise interfere with the operation.
- Artillery support on landing areas in accordance with artillery fire support plans if artillery has been put in place during pre-landing operations.
- Ammunition (e.g., naval, aviation ordnance, artillery) expenditure and fuel consumption prior to the landing.
- Loss of equipment prior to D-day.
- Loss of personnel due to casualties, injuries, sickness, or required recovery periods for long-range reconnaissance teams and aircrews.
- Resupply and rearming schedule for the AF or lack thereof.
- LF requirement to support other forces prior to and after D-day.

11. Amphibious Raid Considerations (JP 3-02, CH4)

Surprise is essential for the success of an amphibious raid. It is an inherent force multiplier achieved by many means. Commanders should consider maximizing surprise through deception, stealth, speed, disguise, and ambiguity. Movement to the objective area is conducted to avoid enemy detection and response.

The following factors will influence the choice of landing areas for the raid force:

Appendix A. Amphibious Operations Planning Considerations Continued

- Enemy disposition.
- Sea approaches.
- Hydrographic and beach characteristics.
- Availability of LZs.
- Avenues of approach to the objective and beach exits.

12. Amphibious Demonstration Considerations (JP 3-02, CH4)

The demonstration area should be near enough to the main effort to permit subsequent employment of the demonstration force if that force is required for subsequent operations. On the other hand, it will be sufficiently separated from the main effort to avoid interference and intelligence collection that may inadvertently detect the demonstration force and to delay the enemy in repositioning forces. The timing of a demonstration conducted in support of another operation should be scheduled to achieve the maximum desired level of reaction from the enemy force.

- A demonstration before the main operation is conducted to:
 - Draw enemy forces to the demonstration area and away from the area of the main operation.
 - Cause the enemy to disclose its positions.
 - Provide protracted and systematic harassment.
 - Divert the attention of the enemy from the main operation.
 - Cause premature commitment of enemy forces.
- A demonstration may commence at the same time as the main operation if it is desired to prevent redeployment of enemy forces and deceive the enemy as to the location of the main operation.
- A demonstration may be conducted subsequent to the main operation to divert enemy forces or fire from the point of the main effort. Successive demonstrations may be executed at a number of points after the main operation commences.

13. Amphibious Assault Considerations (JP 3-02, CH3)

An amphibious assault involves the establishment of an LF on a hostile or potentially hostile shore. An amphibious assault requires the swift buildup of combat power ashore, from an initial zero capability to full coordinated striking power as the attack progresses toward AF objectives. The assault is the most difficult type of amphibious operation and one of the most difficult of all military operations.

Organization is based on the parallel organization of the ATF, LF, and other designated forces. LF organization for landing is the specific tactical grouping of forces for accomplishment of the assigned mission. The organization of ATF forces for the action phase is as follows:

- ATF forces afloat provide the transport groups for the vertical and surface ship-to-shore movement and also provide the necessary landing craft and AAV control organization.
- For the surface movement, the LF may be landed from ships by landing craft, AAVs, or small boats (e.g., combat rubber raiding craft).
- The amphibious warfare ships, landing craft, AAVs, and organic aviation are organized to correspond to the tactical organization of troops to facilitate control and

Appendix A. Amphibious Operations Planning Considerations Continued

- maneuverability. This organization includes boat waves, boat groups, and boat flotillas.
- A boat wave consists of the landing craft or AAVs within a boat group that carries the troops, equipment, or cargo requiring simultaneous landing.
- The boat group is the basic organization of landing craft. One boat group is organized for each surface LF element within scheduled waves at a designated beach.
- Although LCACs are landing craft, their employment differs from displacement landing craft because their speed is greater and they can traverse over obstacles. However, they are often maintenance-intensive and can easily be damaged by enemy fires. Limited operations using one or more LCAC groups may be conducted from as far as 100 miles offshore. However, this distance approaches the maximum capability of the craft and requires careful planning.

14. Amphibious Withdrawal Considerations (JP 3-02, CH4)

Withdrawal begins with establishment of defensive measures in the embarkation area and AOA or operational area and ends when all elements of the force have been extracted and embarked on designated shipping. The amphibious withdrawal is normally executed in the following general sequence of steps:

- Establish defense of the withdrawal and embarkation areas by air, naval, and ground-covering forces while organizing and embarking LF personnel, supplies, and equipment not required for support of operations ashore. As such, maintaining local air and maritime superiority is essential to provide for the safety of the withdrawal.
- Progressively reduce troop strength and quantity of materiel and equipment ashore.
- Consideration must be given to the difficulty of embarking heavy elements such as artillery and armor.

15. Non-combatant Evacuation Operation Considerations (JP 3-02, CH4)

A NEO is similar to an amphibious raid in that there is a rapid insertion of forces followed by a planned withdrawal. Forward-deployed ARG/MEUs are trained and certified to conduct NEOs. Specific amphibious planning considerations for NEOs are:

- On arrival in the area, the CATF establishes and maintains positive communications and effects liaison with local diplomatic representatives. **The CLF should be prepared to augment or duplicate communications.**
- The evacuation site party conducts ground reconnaissance of proposed assembly areas, evacuation sites, beaches, LZs, DZs, airports, and ports.
- The CLF may be tasked to augment existing security forces or to provide forces to secure the evacuation area. Specific and detailed ROE should be promulgated.
- Screening and identification is a primary responsibility of the diplomatic agency. When operational considerations dictate, screening and identification may be executed ashore by other security forces, by the LF, or by elements of the ATF aboard ship. Shipboard screening may be centralized or conducted aboard each ship. The AF may be required to augment emergency medical and dental treatment ashore.
- Evacuation may be made by motor vehicle, ATF shipping, commercial shipping, aircraft, or a combination of these modes. If by motor vehicle, the CLF may be tasked to provide convoy control, communications, and security. Shore-to-ship movement may be made with organic surface and aircraft of the AF. Evacuation by air may be via

Appendix A. Amphibious Operations Planning Considerations Continued

- commercial aircraft from airfields or by use of LF aviation assets.
- Delivery to safe haven may be accomplished by ships of the ATF. Passengers are normally transported as soon as practical to the closest safe haven port or transported for further evacuation from an available airfield or airport. The CLF may be tasked to provide guides, baggage handlers, and shipboard security.
- Operations to protect civilians, noncombatants, and installations are characterized by the necessity of as much detailed planning and liaison as time permits, extensive coordination and communications between military and civilian agencies, high level interest requiring additional reporting, positive C2, and restrictive ROE.

For more information on NEOs, see JP 3-68, Noncombatant Evacuation Operations.

16. Foreign Humanitarian Assistance Operation Considerations (JP 3-02, CH4)

Forward-deployed ARG/MEUs may provide an immediate response capability to respond to FHA operations. They may also form the core of the CE for a JTF headquarters as the US response matures. Specific planning considerations are as follows:

- The CATF should prepare an estimate of the ATF disaster relief supplies and equipment requirements, personnel availability and their skills, and the extent of contingency funding. Similarly, the CLF should prepare an estimate of LF disaster relief capabilities; this estimate would include an analysis of personnel skills, equipment, supplies, and special capabilities of units as they individually relate to likely disaster relief.
- To understand the disaster's impacts, the CATF and CLF should have a comprehensive understanding of the current state of disaster response efforts. Civil affairs forces, if available, can assist with this research and liaison.
- Additional augmentation and redistribution of personnel in the AF may be required. It may be necessary, for example, to augment appropriate amphibious warfare ships with tactical air control center and flight deck personnel in order to conduct 24-hour flight deck operations. Additional medical staff may also be assigned.
- The CATF and CLF must manage expectations and clearly articulate their role and capabilities. In order to manage the information environment, it is critical that the public affairs officer have situational awareness of the actions and locations of operational forces as well as the actions and reporting of commercial media.
- The AF planners should consider the following:
 - Security for the landing beaches and LZs.
 - Large numbers of civilian helicopters and fixed-wing aircraft may be operating in the areas to support the relief effort.
 - Method to track AF personnel who are ashore (who and where).

Appendix A. Amphibious Operations Planning Considerations Continued

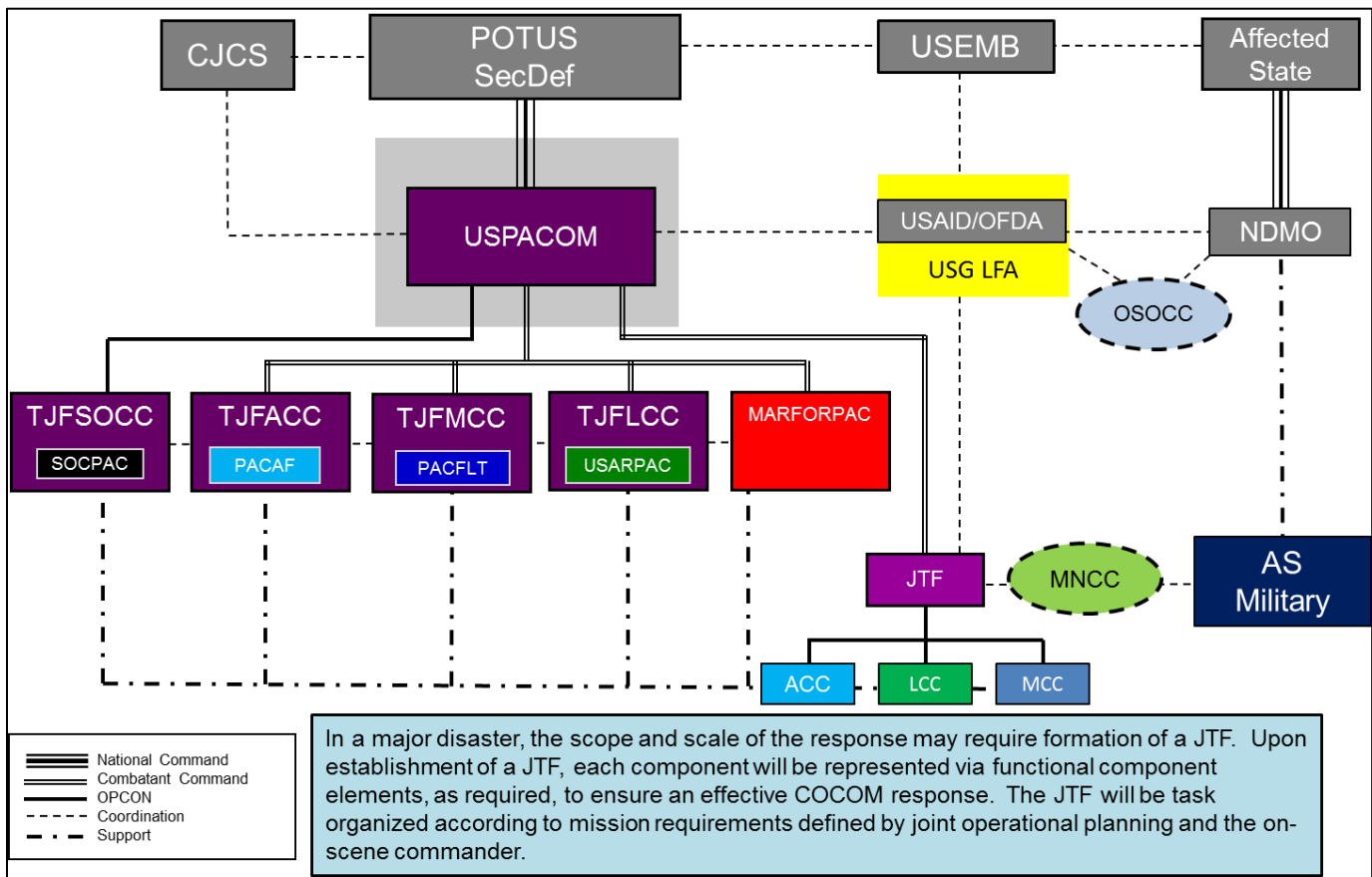


Figure 12.4

For more information on FHA, see JP 3-29, Foreign Humanitarian Assistance, and NWP 3-29, Disaster Response Operations.

17. Intelligence Support to Amphibious Operations (JP 3-02, CH5)

Because amphibious operations are characterized as the most complex and difficult of military operations, **intelligence activities must consider all aspects of the operational environment that drives timely and informed decision making.** The commander should consider the size and duration of the operation and the organic intelligence capabilities of the AF when establishing either a joint intelligence support element or an operational-level joint intelligence operations center to support the AF. The following intelligence capabilities are required to support amphibious operations:

- Interoperable information systems that provide timely dissemination of information for amphibious planning, rehearsals, and execution.
- Information management systems to include C2 applications and collaborative information sharing to coordinate collection and dissemination efforts. These systems support information management plans, which should be integrated into and fully support mission requirements.
- Standoff collection assets capable of satisfying ATF and LF requirements from OTH.
- Intelligence dissemination systems linking widely dispersed forces afloat and ashore.
- Flexible intelligence assets capable of rapidly transitioning ashore with minimal degradation of support.

Products from the Joint Intelligence Preparation of the Operational Environment (JIPOE) process may be included as an annex or distributed as separate studies and reports, and should include, at a minimum:

- Weather studies (mapping, charting, and geodesy).
- Astronomical data in the operational area.
- Climatological and meteorological studies.
- Tidal and ocean current data in the operational area.
- Hydrographic data in the operational area.
- Topographic data to include terrain impact on communications system and trafficable analysis.
- Beach and LZ studies.
- Air facilities.
- Ports and harbors.
- Special studies on adversary and other relevant actors.
- Sociocultural analysis on the civilian populace and culture.

Intelligence operations support COA development in several ways:

- Continuously update the view of the operational environment and estimates of adversary capabilities, intentions, and activities.
- Provide focus on the adversary through identification of adversary COGs, critical vulnerabilities, and potential COAs, with emphasis on the most likely and most dangerous COAs.
- Assist in the prioritization of targets of interest.

18. Fire Support to Amphibious Operations (JP 3-02, CH5)

Properly planned and executed lethal and nonlethal supporting fires are critical to the success of an amphibious operation. Since the availability and employment of one supporting weapon system influences the requirements for the others, the fire support requirements of all components of the AF should be considered together in planning the employment of fire support means.

The Supporting Arms Coordination Center (SACC) is established on initiation of planning. **The SACC plans, coordinates, and controls all organic and nonorganic fires within the operational area in support of the AF.** It is located aboard a ship configured with the requisite C2 facilities to coordinate all forms of supporting fires (land, air, and sea-based).

- Although normally only one SACC is active at any one time, amphibious advance force operations may require the establishment of a fire support agency to coordinate fires in support of the neutralization or destruction of enemy high value assets or the emergency extraction of SOF or reconnaissance units.
- Assault breaching, a part of amphibious breaching, is a preplanned fire support mission using precision guided munitions to neutralize mines and obstacles in the SZ and on the beach. Assault breaching must be coordinated and synchronized with the maneuver of troops going ashore, other D-day fires, and ongoing MCM operations, in particular, underwater MCM operations being conducted in the very shallow water (10-40 foot depth contours) region. The breach is conducted by the CATF through the SACC and the Navy TACC.

Appendix A. Amphibious Operations Planning Considerations Continued

For more information, see NTTP 3-02.2/MCWP 3-31.6, Supporting Arms Coordination in Amphibious Operations.

19. Naval Surface Fire Support to Amphibious Operations (JP 3-02, CH5)

The CATF prepares the overall NSFS plan, based on the CLF and Navy requirements. The plan allocates gunfire support ships and facilities. The CATF establishes the general policy on NSFS targeting priorities. The CLF determines LF requirements for NSFS, including selection of targets to be attacked in pre-assault operations, those to be fired on in support of the LF assault, and the timing of these fires in relation to the LF scheme of maneuver. When designated the supported commander, the CLF coordinates the timing, priorities, and desired effects of fires within the operational area.

The pre-D-Day NSFS plans, which have the primary objective to prepare the landing area for the assault, usually include the following elements:

- Assignment of ships to FSAs and zones of fire.
- Communications instructions.
- Designation of targets, provision for damage assessments, and acquisition of target intelligence.
- Provision for availability of spotting aircraft (manned or unmanned) and reference to appropriate air support plans, to include potential CAS operations.
- Provision to coordinate with MCM, underwater demolition, and air operations.
- Provision to record target information and report latest intelligence data to the CATF.

The **essential elements** of the plan for D-day NSFS plans include:

- Assignment of ships to FSAs, zones of fire, and in direct and general support of specific LF units.
- Location of landing craft approach and retirement lanes, aircraft ingress/egress routes, and necessary coordinating instructions. These same instructions will be found in the appropriate portions of the related air support plan.
- Communication instructions and procedures for transfer of control.
- Designation of targets, target areas, deep support areas, and probable routes of approach of adversary reinforcements.
- Provisions for spotting aircraft.
- Instructions for massing fires of several ships.
- Provisions to coordinate ship-to-shore movement, MCM, underwater demolition, artillery, and air operations.
- Closely timed neutralization of remaining adversary defenses to cover the waterborne, airborne ship-to-shore movements, and support of the landing, deployment, and advance of troops.
- Degrade adversary C2 ability.
- Isolation of the landing area and defense against adversary counteroffensive action by massed fires on probable routes of approach with particular provisions for counter-mechanized programs.

The post D-day NSFS plans provide for:

Appendix A. Amphibious Operations Planning Considerations Continued

- Fires on the flanks of the landing area and fires against targets of opportunity.
- Defensive targets, night fires, illumination, counter-mechanized fires, and any special fires utilizing the inherent capability of gunfire ships and available munitions as required.

For more information, see NTTP 3-02.2/MCWP 3-31.6, Supporting Arms Coordination in Amphibious Operations.

20. Non-lethal Fire Support to Amphibious Operations (JP 3-02, CH5)

Nonlethal fires are any fires that do not directly seek the physical destruction of the intended target and are designed to degrade the performance of enemy forces, functions, or facilities, or to alter the decision making or behavior of an adversary. Employment of nonlethal fires and information-related capabilities must be integrated into all amphibious operations to produce synergistic results. Examples include masking smoke or obscurants, nighttime area illumination, AD, and employment of some information-related capabilities, such as EA, MILDEC, and offensive cyberspace operations, that deceive the enemy, disable the enemy's C2 systems, or disrupt operations.

See JP 3-13, Information Operations, for further discussion on considerations, planning, and integration of information-related capabilities.

21. Offensive Air Support (JP 3-02, CH5)

Offensive air support requires an integrated, flexible, and responsive C2 structure to process CAS and other air support requirements and dependable, interoperable, and secure communications architecture to exercise control.

Air Support Planning Responsibilities

- CATF determines overall air support requirements of the ATF, determines air support capabilities, coordinates all air support requests, and prepares an air plan.
- CLF determines LF air support requirements, determines LF air support capabilities, submits plans for deployment of aviation elements ashore, and prepares an air plan.
- JFACC provides JFACC representation, determines JFACC air support capabilities, submits deployment plans, and prepares supporting air plans.

Air Support Planning Considerations

- All aircraft operating within the objective area must be under centralized control of a tactical air control system. A combination of positive and procedural control measures may be required.
- Plans should usually provide for rapid seizure of existing airfields, airfield capable sites, and sites for early warning and air control. This enables the early deployment ashore of aviation elements and extends the radius of warning and control.

The LF plans for the employment of LF aviation to support the ship-to-shore movement and scheme of maneuver ashore. Basic planning also establishes requirements for air support from the other elements of the AF and joint force. Any adversary facilities to be captured intact must be specified and placed on the no-strike list or restricted target list.

Appendix A. Amphibious Operations Planning Considerations Continued

- Recommendations and requests from subordinate echelons of the LF are evaluated and consolidated with overall LF requirements into a comprehensive request for air support. When determining overall requirements, pre-D-day should be separated from D-day and post-D-day requirements.
- LF requests for pre-D-day air operations are to satisfy intelligence needs and offensive air operations to reduce adversary forces and defensive installations in the landing area.
- Post-D-day air support can only be planned in general because requirements will depend on the tactical situation ashore and will not be fully known in advance. Applicable pre-D-day and D-day air operations are continued.

22. Ground-based Fire Support (JP 3-02, CH5)

Ground-based fire support comes under the cognizance of the MAGTF. The two principal ground-based assets available to the CLF commander are field artillery and mortars.

- The artillery fire plan is normally formulated in the fire direction center (FDC).
- Some planning tasks such as counter-fire procedures and scheduling of fires, may occur in the supported unit's FSCC (division or regiment) when multiple supporting arms are being integrated into the fire support plan.
- Remaining artillery fire planning tasks such as fire direction, resupply, and positioning to meet the fire support requirements are then performed at the appropriate FDC.
- If it is not possible to coordinate artillery support at lower echelons, the requisite coordination with air and NSFS assets is accomplished in the SACC.

See JP 3-09, Joint Fire Support, and NTTP 3-02.2/MCWP 3-31.6, Supporting Arms Coordination in Amphibious Operations, for more information.

23. Communications (JP 3-02, CH5)

CATF and CLF are responsible for communications system support planning, with the designated commander consolidating the requirements. The communications system support plan must reflect the coordinated communications system requirements of the AF.

Communications System Support Plan

- General coverage of the communications situation, including assumptions, guiding principles, and the concept of operational communications employment.
- Announcement of the communications mission.
- Delegation of communications tasks and responsibilities to major elements of the force.
- Detailed instructions for organizations, installation, operation, coordination and maintenance of the communications system.
- Assignment and employment of call signs, frequencies, cryptographic aids, and authentication systems.
- Instructions on countermeasures, operations security, and communications security.
- Interoperability of computer systems, to include hardware and software.
- Logistic support for communications and electronics.

Figure 12.5

- The plan is prepared in detail to facilitate use by commanders at all echelons.
- The plan should include enroute, inter-theater, and intra-theater communications and systems requirements.

Specific CATF responsibilities include the following:

- Prepare and promulgate coordinated plan for employment of AF communications during the operation.
- Acquire and assign necessary communications assets to subordinate elements of the force.
- Prepare appropriate cybersecurity guidance.
- Provide necessary shipboard communications system and services to support the embarked LF.
- Develop a coordinated communications plan for the ATF for inclusion in the overall communications system support plan.
- Develop and promulgate a plan for communications connectivity with other maritime forces.

An effective communications system support plan:

- Provides an EMCON plan and information security posture that balances OPSEC versus operational requirements.
- Supports defensive cyberspace operations and cybersecurity in order to defend the network against unauthorized activity and to protect information from exploitation.
- Avoids mutual interference throughout the EMS. Communications system support plans of the AF must be integrated into the JFC's joint communications electronics operating instructions.

Appendix A. Amphibious Operations Planning Considerations Continued

- Deconflicts friendly EA with other friendly frequency use.
- Provides friendly forces' position reporting to the Global Command and Control System–Maritime common operational picture.
- Identifies alternative means of communications to assist in reducing mutual interference and decreasing frequency requirements and to help ensure availability of communication networks.
- Provides access to METOC forecasts and information impacting amphibious planning and execution.
- Incorporates multinational forces requirements into communications plans.
- The topography when operating in enclosed bays or estuaries and the vicinity of mountains may affect communications paths. Communications support requirements in amphibious operations are summarized in the following figure:

Communications Support Requirements

A reliable, secure, rapid, flexible, and interoperable command and control, communications, and information system is required in both planning and execution.

- Support planning.
- Control ship-to-shore movement.
- Coordinate protection of the amphibious force.
- Control assault vehicles and craft.
- Monitor command and control of amphibious advance force operations.
- Coordinate supporting arms.
- Coordinate logistic support and combat service support.
- Coordinate support provided by other forces.
- Medical regulation.
- Coordinate use of communications and electronic warfare.
- Support the landing force scheme of maneuver.

Figure 12.6

- Each major command of the force must have compatible and interoperable communications that will support the tactics and techniques employed by that force. Circuits provided must assure effective exercise of command and coordination of supporting fires.
- Subordinate commands of the AF may operate in widely separated areas during some phases of the amphibious operation. The communications plan must permit rapid integration of the force without undue interference between elements.
- Local frequencies and communications standards in use in the landing area should be considered to ensure compatibility and to prevent interference.
- Communications system connectivity should be established among all major participating commands at commencement of the planning phase.

Appendix A. Amphibious Operations Planning Considerations Continued

- When AF are supporting other operations, such as FHA or NEO, the communications plan should consider the capabilities and requirements of other USG departments and agencies, intergovernmental organization, and nongovernmental organization communications, as well as the local government or populace being assisted.

24. Logistics (JP 3-02, CH5)

The CATF and the CLF have co-responsibility for determining overall logistic requirements for the AF. Wherever possible, sustainment planning should include direct ship-to-user delivery. Some planning considerations include:

- Orderly assembly and embarkation of personnel and materiel based on anticipated requirements of the LF scheme of maneuver ashore.
- Establish and maintain a logistic system in the operational area that will provide adequate support to all elements of the AF and subsequent support of base development and garrison forces as directed.
- Impetus of logistic support from the sea, or the rear, and directed forward to the point of application at the using unit.
- Preservation of OPSEC during logistic planning. Non-secure logistic planning can compromise tactical surprise and landing location.

Logistic planning factors are as follows:

- Type, size, and duration of the operation, including the anticipated date that support should commence and will no longer be needed.
- Objective area characteristics, such as geography, climate, distance from support bases, host nation support, transportation systems and networks, LOCs, local contracts for goods and services, and throughput capacity.
- Enemy capabilities.
- Strength and composition of LF.
- Support base resupply methods.
- Compatibility and capability of logistics support systems.
- Communications means.
- Adversary CBRN capabilities.
- Availability of AE and AFOE shipping.
- Indigenous health risks and diseases prevalent.
- Requirements for rehabilitation or construction of airfields.
- Support required for detainees.

Plans should include the following:

- Supply and resupply responsibilities, schedules, and sources.
- Levels of supply to be carried in AE, AFOE, and follow-up shipping.
- Control and distribution of supplies.
- Plan for landing supplies.
- Engineering and construction requirements.
- Air delivery responsibility, procedures.
- Captured material disposition instructions.

Appendix A. Amphibious Operations Planning Considerations Continued

- Salvage instructions.
- Retrograde.
- Casualties (support and evacuation procedures).
- Initial laydown of material resources.
- Mortuary affairs support and evacuation of human remains.

25. Health Services (JP 3-02, CH5)

The health services plan is usually issued as annex Q (Medical Services) to the OPLAN and provides for medical support to all elements of the AF. The LF health services plan will be issued as annex Q (Medical Services) to the LF OPLAN. The CATF and CLF surgeons should develop the medical logistic support plan.

Health Services Planning Considerations

Goal:
Providing for the health of the command and evacuation and hospitalization of sick and wounded.

Planning must consider:

- Overall mission of the force and the supporting medical mission.
- Policies of higher commanders.
- Landing area characteristics.
- Physical, biological, and psychological threats to personnel.
- Lines of communications and evacuation.
- Evacuation policies and procedures.
- Medical supplies required.
- Blood and colloid requirements.
- Casualty estimates.
- Medical personnel available and status of their training.
- Supporting medical facilities and forces outside the objective area.
- Medical needs for civilian population and enemy prisoners of war, if authorized.
- Need for service medical unit augmentation.
- Requirements for casualty receiving and treatment ships.
- Aircraft and landing craft to provide ambulance facilities.
- Medical augmentation requirements for common-user shipping.
- Other medical facilities available within the objective area.

Figure 12.7

26. Logistics Over-the-Shore and Maritime Prepositioning Operations (JP 3-02, CH5)

LOTS operations, which include Navy LOTS, Army LOTS, and JLOTS, support offload of supplies, vehicles, and equipment in amphibious operations following the initial assault. OPDS and the amphibious bulk liquid transfer system may also be included in the operations. The CATF is responsible for debarkation and off-load until termination of the amphibious

operation, when the responsibilities for debarkation or off-load are passed to another off-load organization designated by higher authority, such as to the JLOTS commander. The amphibious operation is not normally terminated until the AFOE is ashore.

The MPF offers an augmentation capability for amphibious operations, but it is not a substitute due to an inherent lack of forcible entry capability. An MPF operation provides a means to augment a forward-deployed MAGTF; an ongoing amphibious operation; or another joint, multinational, or combined force operation. When an MPF operation augments an amphibious operation, the MPF mission and appropriate command relationship guidance is included in the initiating and establishing directives.

For additional information, see JP 4-01.6, Joint Logistics Over-the-Shore, and MCWP 3-32/NTTP 3-02.3, Maritime Prepositioning Force Operations.

27. Airspace Planning (JP 3-02 CH2)

Air operations in support of the AF are performed with air capabilities and forces made available by components in support of the JFC's or AF's objectives. To create synergy and avoid duplication of effort, the JFC synchronizes and integrates the actions of assigned, attached, and supporting capabilities and forces in time, space, and purpose. The JFC may accomplish this in the air through designation of a JFACC, area air defense commander (AADC), and airspace control authority (ACA) for the JOA. If established, the JFACC uses joint air to support amphibious operations within the AOA, as required through coordination with the JFMCC. Air operations conducted within the AOA are controlled by the ATF and/or LF air staff as designated.

An AOA and AO include airspace in which there may be a concentrated number of airspace users and varied weapons such as artillery, missiles, and naval surface fire support (NSFS). This airspace has defined dimensions that usually coincide with specific geographical features or navigational aids and are typically initiated by the CATF as the primary user.

Considerations for establishing this airspace include:

- Airspace control capabilities of the AF.
- Entry and exit routes and procedures into and out of the AOA or HIDACZ and to the target area.
- Air traffic advisory as required. Procedures and systems should be considered for air traffic control service during instrument meteorological conditions.
- Procedures for expeditious movement of aircraft into and out of the AOA or a HIDACZ.
- Coordination of fire support, as well as air defense weapons control orders or status within and in the vicinity of the AOA or HIDACZ.
- Range and type of NSFS available.
- Location of enemy forces inside, and in close proximity to the AOA or HIDACZ.
- At a minimum, the AOA or HIDACZ should cover the ATF's landing area and extend inland to the LF's objectives, which may be beyond the fire support coordination line. Additionally, the AOA or HIDACZ should be large enough to accommodate the flow of aircraft into and out of the amphibious operations airspace.
- Range and maximum ordinate of joint force ground based artillery, rocket, and mortar systems.

Appendix A. Amphibious Operations Planning Considerations Continued

Strait Transit Briefing Considerations	
Brief Attendees	
CATF	Navy: CATF, all warfare commanders, all commanding and operations officers, air boss, navigators, combat system (weapons) officers, air operations officer, TACRON, judge advocate general, MH-60S detachment officer-in-charge, and others as required.
CLF	CLF, ACE (including the LAAD detachment), and GCE (including weapons company and snipers), staff judge advocate, and others as required.
Brief Content	
N3	Overview and mission
Navigator	Geographic overview including track and speed of advance
Meteorological and Oceanographic	Weather (environmental impacts on ATF and potential adversaries)
N2	Threat update Enemy's most likely/most dangerous COAs Intelligence, surveillance, and reconnaissance support
N3	Command relationships: supporting/supported Tactical situation Go/no-go criteria: weather, threat, systems Scheme of maneuver: guide ship, distance between ships, formation, breakdown plan, query ship, screen commander, low visibility Aviation scheme of maneuver to include organic and nonorganic air Expected interactions: other militaries, queries, merchant shipping, fishing vessels, other air Preplanned responses CWC, ship, aircraft, and quick reaction force communication procedures Data link overview Operational reporting Commencing transit, entering traffic separation scheme Exiting traffic separation, transit complete Compliance with visual reporting requirements ROE and force posture Theater ROE, theater-specific queries and warnings Escalation of force Self-defense
Warfare Commanders	Priorities Tactical situation, threat condition, warning and weapon status
Air Boss	Air plan Deck spotting
Ships' Weapons Officers	Weapon systems status Small caliber action team plan Engagement zones
N6	Communications plan/circuit allocation
CLF	Quick reaction force Aviation support

Appendix A. Amphibious Operations Planning Considerations Continued

Action Phase Considerations for Defense of the ATF	
Higher and AF's Mission	CAF's mission CAF's desired end state Type of amphibious operation: assault, raid, demonstration, withdrawal, or AF support to crisis response and other operations LF scheme of maneuver Size force to land When the operation will take place Fire support required Length of time the LF remains ashore
Threat	Permissive, uncertain, or hostile operational environment Capabilities and limitations of the adversary: air, surface, subsurface, and IO Adversary's most likely/most dangerous COAs
Environmental Considerations	Weather Winds/visibility/ceilings Pressure altitude, density altitude, minimum altimeter Air and sea temp Terrain/hydrography Sea state/tidal ranges/modified surf index Littoral geography Water depth/type Currents Sun position/moon position and phase/light level (solar-lunar almanac program) Beach survey/study results
Shaping Plan	Air, surface, subsurface preconditions Capabilities to achieve preconditions Assessment plan to ensure preconditions are met Advance force operations, including AF and non-AF reconnaissance Integration of fire support plan with higher headquarters
Other Forces	Combined/joint force maritime component commander CSG Navy expeditionary force Combined/joint force air component commander Combined/joint force land component commander Combined/joint force special operations component commander Host nation Nongovernment organizations, especially during AF support to crisis response and other operations

Appendix A. Amphibious Operations Planning Considerations Continued

<p>Scheme of Maneuver</p>	<p>Ingress to AOA/area of operations including ATF screens and formations Approach routes to minimize exposure to enemy observation/fires Selection of routes/objectives to avoid enemy defenses/hard points Air, surface, and subsurface defense CRUDES S Naval surface fires DCA locations Airborne and surface radar coverage Land-based missile and air defense Use of and coordination with advance force elements Military deception plan Conduct orders/OPGEN/OPTASK crosstalk</p>
<p>Ship-to-Shore Movement</p>	<p>Placement of air defense, surface, and subsurface defense assets Location of amphibious warfare ships: boat lanes, LCAC lanes, the inner and outer transport areas, FSAs, approach routes, etc. Method forces getting ashore: AAVs, LCU, LCAC, helicopters, tiltrotor Dispersion of landing craft and aircraft Length of time to offload; cycle time and movement times Location of beaches, HLZs, and routes Location of demarcation line for MCM Conduct orders/OPGEN/OPTASK crosstalk</p>
<p>C2 Transition from Afloat to Ashore</p>	<p>Supporting/supported change and transition of beach defense responsibility Changes in authorities and communications plan</p>
<p>Sustainment Plan</p>	<p>Resupply/support requirements Mobility of ATF Other options for resupply LF Defense of other ships (e.g., T-AKE, maritime pre-positioning force ships, etc.)</p>

Appendix B. AMW Mission Planning Kneeboard

LCAC

- REFERENCES:
 (a) SEAOPS VOL I
 (b) SEAOPS VOL II
 (c) SEAOPS VOL IV
 (d) SEAOPS VOL VII

Go/No-Go

- Surf > 8 ft
- Visibility < 1 nm
- SWH > 6.9 ft
- Well Deck Ops > 5 ft
- Beach Grade > 6 Deg
- Loss of all comms
- Loss of Nav Suite
- OOC Radar during Night ops

Crew Day

- Overland
 - o 12 hrs day, 8 hrs night
- 0.5 to 3 ft SWH
 - o 12 hrs day, 8 hrs night
- 3 ft to 5 ft SWH
 - o 8 hrs day, 6 hrs night
- If reduced visibility
 - o Divide Crew day by 2
- If begin prior to sunrise, SHALL end at sunset even if 12hr limit not exceeded

Crew Rest

- 12 hrs continuous; 8hrs sleep

Speeds

- Planning Speed – 35 kts

Beach Considerations

- CLZ Size – 50x50
- Beach Separation – 500yds
- Line abreast – 100yds
- Sea Echelon Lane Size – 50yds

Ship to Shore

- Well deck 0"-6" non-displaced
- Well deck- 5' displaced
- Unload times
 - o @ Beach – 15 min
 - o @ Well – 25 min

- Load times
 - o @ Beach – 30 min
 - o @ Well – 35 min
- Refuel time
 - o 40 min

Load Planning

- PAX → 13 combat loaded, 18 w/o
- Cargo → 60 tons - 0-6.9 ft max SWH / 75 overloaded – 0-4 ft max SWH
- Notional Load (< 368250 lb total)
 - o 1 M1A1
 - o 2 Howitzers + 7 ton trucks/MTVR
 - o 4 LAV's
 - o 13 HMMWV (9 Up-Armored)
 - o 1 PTM (150 troops/180 PAX)

*Max load varies upon ambient air temp, SWH, and water depth

Waiver request

- Verbal Waiver Request and Authorization Procedure if it is determined that a deviation from SEAOPS procedures, capabilities, or limitations is required, and operational expediency so dictates.
- The LCAC Operational Commander may grant a verbal waiver. Prior to granting approval, Operational Commanders/staff should ensure special consideration is taken.
- A verbal waiver must be followed up by a hard copy verbal waiver message confirmation (Figure C-2) within 12 hours.

PTM

- 180 PAX
 - 120 Combat Loaded
- Six sections total/30 PAX per section

LCU

- REFERENCES:
 (a) ACU One SOP (ACUONEINST 3120.4J)

Characteristics

- Range: 1000nm
- Endurance: 10 days
- Draft: fwd-3'6"; aft-7'

Go/No-Go

- o NO-GO if visibility is less than 500 yards.
- Beaching/retracting
- o NO-GO if MSI exceeds 4 without seaward salvage available. (Routine peace-time evolutions)
- o NO-GO if MSI exceeds 6 with seaward salvage available. (Routine peace-time evolutions)
- o NOTE: Maximum MSI for beaching during wartime is 12.

Well Deck Operations: Per reference (A), well deck operations should not be conducted if seas are greater than or equal to 10 feet.

- For entering the well:

- o NO-GO if minimum water depth at the sill will provide less than 18 inches of water below the craft draft (i.e., if actual LCU draft is 6 feet; minimum depth at the sill must be 7 ft 6 inches).
- o NO-GO if wave action in the well is greater than or equal to +/- 2 feet.
- o NOTE: There is no minimum water depth for exiting the well. Once the craft is live in the well, and the Craftmaster deems it is safe to proceed, he/she shall request GREEN WELL and the craft may exit the well in a safe and expeditious manner.

- Stern gate marriages

- o Actual or predicted seas are in excess of one foot.

- o NO-GO if current exceeds 1 knot.

- Liberty Boat NO-GO if seas are in excess of two feet.

NOTE: The use of LCU as liberty boats is not encouraged when other alternatives are available. However, should this tasking occur, the following will apply: All efforts will be made to get the LCU crew liberty. No more than 250 pax will be transported at one time. Ship will provide all life jackets, shore patrol, a corpsman, and a working party to assist in cleaning the craft after liberty runs.

Speeds

- Planning Speed – 8 kts
- Max – 12 kts (10 with load)

Beach Considerations

- Beach Width – 2x craft length + 50 yds = approx. 300 FT
- BPT Setup time = 45-60min

Load Planning

- PAX → 350 combat loaded
- Cargo → 125 tons (320320 lbs)
 - o BMU or
 - 1st load – 2 LARC's / 1 Dozer
 - 2nd Load – 3 HMMWV/1-5ton
 - o 12 HMMWV
 - o 4 Howitzer + 4-5yon
 - o 1 M1A1 Tanks
 - o 24 CRRC's
 - o 9 LAV's
 - o 4-5 MTVR's
 - o 4-5 MTVR's

Appendix B. AMW Mission Planning Kneeboard

AAV

REFERENCES:

- (a) 3-02.1 Amphibious Embarkation and Debarkation
- (b) NTPP 3-02.1M, Ship to Shore Movement

Characteristics

- Range- Water - Max 45 NM
- Planning: 5 NM
- 21 troops (18 combat loaded) or 10,000 lbs cargo

Go/No-Go

- Sea State > 3 (3.5-4ft WH)
- MSI > 6
- Safety Boats: 1 for 5 or less vehicles, 2 for >5

Speeds

- Water – 6+KTS
- Land – 25+MPH

Ship to Shore

- Distance based on tactical situation and H-hour (time/space).
- Doctrinal Boat Lane: 2,000 – 2,700 yds x 500 yds
- Column of 2 @ 7.5 sec intervals ship @ 10 kts optimal, separate boat lane
- Beach composition: for in-depth planning considerations for AAV BLS see MCWP 3-13 , chapter 3, or AAV common SOP BO P3000.1H, chapter 3.

CRRC

REFERENCES:

- (a) COMNAV SURFPAC/SURFLANTINST 3000.15A/MARFORLANT/PACINST P3000.15, Standard Operating Procedures for Raiding Craft.
- (b) MCWP 3-43.1 RAID OPERATIONS

Go/No-Go

- Sea State > 3

Characteristics

- Length - 15'5"
- Width - 6'3"
- Limited to operating in 6-foot combined seas
- Advantage - can be launched and/or recovered by an LCU
- Engine: one 35 to 55-hp engine
- Range: nominal range is 36 nm
- Endurance: dependent on the size of the motor and amount of fuel carried
- Draft: 2'

Speeds

- Speed – 18 kts

Well Deck Operations

- Well deck – 1' at the sill launch/recovery

Ship to Shore

- Launched from over-the-horizon (20 nautical miles from shore)

Load Planning

- PAX → 8
- Load capacity – 2,000 lbs.

Fuel

- * MOGAS

General Tonnage Guidelines

REFERENCES:

- (a) SEAOPS VOL IV Part2
- (b) BMU-HNDBK-5400.1

Item	Long Tons
D-6 Dozer Type II w/Armor cab	36,340 lbs
M1A1 Tank	63-73 Tons
LARC V	13 Tons
MTVR	15 Tons
M149 Water Trailer	(empty) 2,730 lbs (full) 6,062 lbs
HMMWV	3 ¼ Tons
155mm Howitzer	15,800 lbs

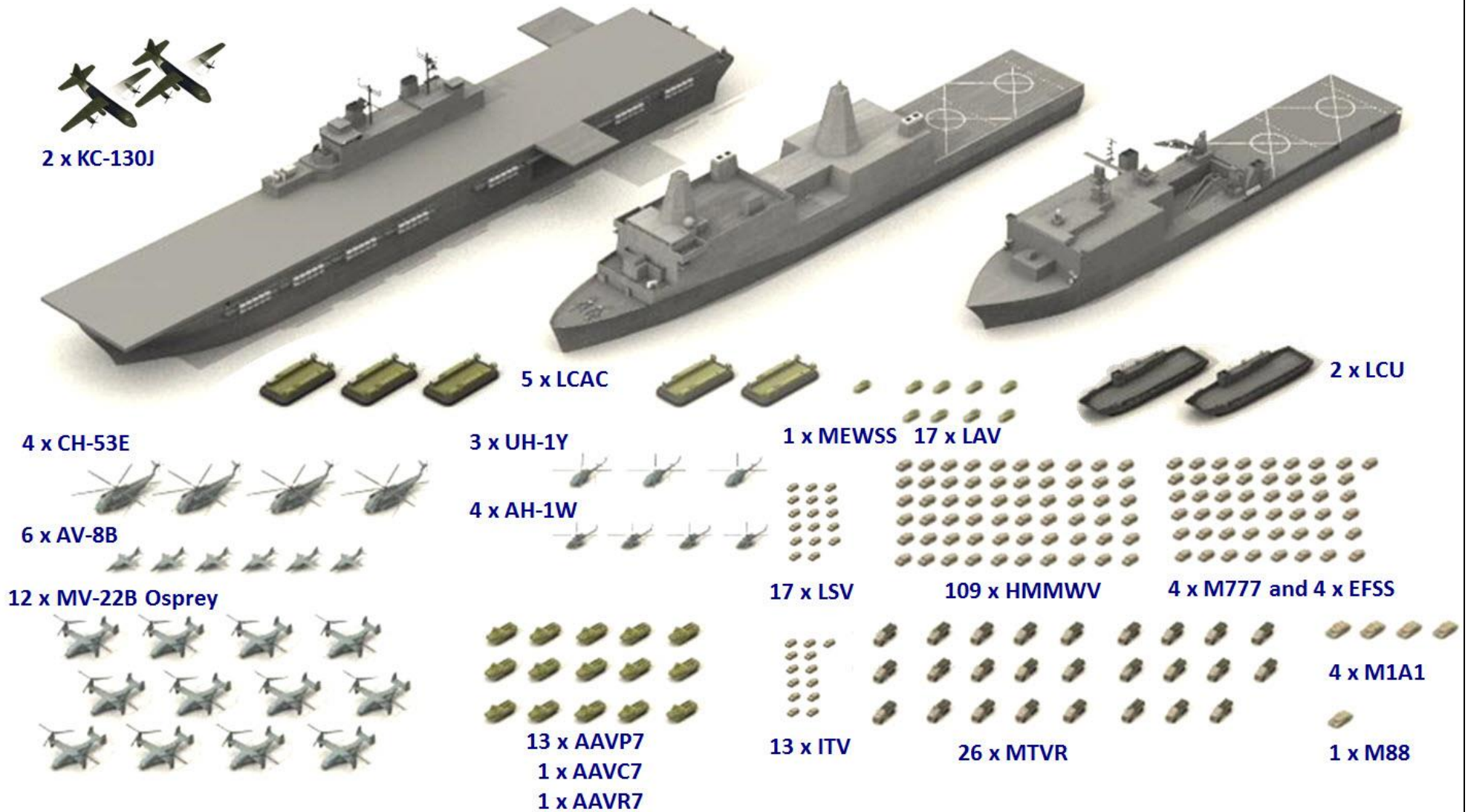
General Beach Notes

- Steep gradients more than 1:15 (7%) tend to produce a very high percentage of plunging breakers
- Moderate gradients between 1:15 (7%) and 1:30 (3%) tend to produce spilling breakers but often create a mixed percentage of both
- Moderate gradients produce bars and extend the surf zone creating 2-4 lines of breakers

Evolution	Time Required
Pre-Ballast	2hr 40min (LSD) – 4hr (LHD)
Ballast to 8' for LCU	20-30 min
Ballast to 4 to 6' for AAV (steep wedge)	25-35 min
De-Ballast from 8' to steaming draft	45-60 min
Ballast to 0' from steaming draft	From 10 min (LSD) to 20 min (LHD)
Load LCAC/LCU -well	35 minutes
Off-load LCAC/LCU - well	25 minutes *
Load LCAC/LCU on beach	30 minutes
Off-load LCAC/LCU beach	15 minutes
Refuel LCAC – well	40 minutes
PTM Build / Teardown	8 hours
Beach Setup	1 hour

* Load dependent

Appendix C. Standard MEU Equipment



Appendix D. Capabilities Table

TYPE	SENSORS	WEAPONS
SHIPS		
LHA/LHD	<u>MH-60S</u> <u>Radars</u> AN/SPQ-9B AN/SPS-48 AN/SPS-49 AN/SPS-67 AN/SPS-73 <u>Comms</u> Link 11 and 16 CEC (LHA 6 and 7, LHDs 1, 7-8) <u>Electronic Warfare</u> AN/SLQ-32	<u>Missiles</u> Evolved Sea Sparrow or NATO Sea Sparrow missile HELLFIREs from the MH-60S Rolling airframe missile (RAM) <u>Guns</u> Phalanx close-in weapon system (CIWS) Block 1B 25mm gun (MK 38 Bushmaster) M2 .50 caliber machine gun (also aboard the MH-60S) <u>Undersea Warfare</u> AN/SLQ-25 Nixie decoy system Degaussing (should always be energized) <u>Electronic Warfare</u> AN/SLQ-32 electronic attack (LHA-6 Not installed) Chaff MK 53 Nulka (if installed)
LPD 17	Same as LHAs/LHDs except all LPDs have CEC but no SPS-49 or SPS-67. UAS RQ-21 Blackjack	Same as LHAs/LHDs except: No Sea Sparrow missiles, CIWS, or MK 38 25mm gun 30mm cannon (MK 46)
LSD 41	<u>UAS</u> RQ-21 Blackjack <u>Radars</u> AN/SPQ-9B AN/SPS-49 AN/SPS-64 AN/SPS-67 AN/SPS-73 <u>Electronic Warfare</u> AN/SLQ-32	<u>Missiles</u> RAM <u>Guns</u> 25mm gun (MK 38 Bushmaster) 20mm gun (MK 15 Phalanx CIWS Block 1B) Grenade machine gun (MK 19) .50 caliber machine gun <u>Electronic</u> Chaff MK 53 Nulka <u>Undersea Warfare</u> AN/SLQ-25 Nixie decoy system Degaussing
MCM 1	AN/SQQ-32 minehunting sonar AN/SSN-2 command, control, and precise navigation	AN/SLQ-37 Magnetic and acoustic sweep AN/SLQ-38 Mechanical sweep AN/SLQ-48 Mine neutralization system

Appendix D. Capabilities Table

TYPE	SENSORS	WEAPONS
SHIPS (cont.)		
CG 47	<p>MH-60R equipped with Link 16, Hawklink, etc. MQ-8B Fire Scout Radars: AN/SPQ-9B (replacing the AN/SPS-49) AN/SPS-73 is replacing the AN/SPS-55 and 64 radars AN/SPY-1</p> <p><u>Sonar</u> AN/SQQ-89 AN/SQS-53C AN/SQR-19</p> <p><u>Electronic Warfare</u> AN/SLQ-32</p> <p>Comms Link 11 and 16 and CEC</p>	<p><u>Missiles</u> Evolved Sea Sparrow missile Harpoon missile HELLFIRES from MH-60R Standard missile (SM) 2, 3, and 6 (medium range, BMD, and extended range) Tomahawk land-attack missile</p> <p><u>Guns</u> 5-inch/54 or 62 caliber MK 45 gun (one forward, one aft) 25mm gun (MK 38 Bushmaster) 20mm gun (MK 15 Phalanx CIWS Block 1B) .50 caliber machine gun</p> <p><u>Undersea Warfare</u> MK 46 or MK 54 torpedo launched from the MH-60R, vertical launch missile, or from torpedo tubes AN/SLQ-25 Nixie decoy system Degaussing</p> <p><u>Electronic</u> AN/SLQ-32 electronic attack Chaff MK 53 Nulka</p>
Flight I (DDG 51–71) and Flight II (DDG 72–78)	<p>Same as CG-47 class except no embarked helicopters No SPS-49 AN/SPQ-9B CEC (on some ships)</p>	<p>Same as CG-47 except no embarked helicopter One 5-inch/54 or 62 caliber MK 45 Gun (forward)</p>
Flight IIA (DDG 79 and greater)	<p>Same as DDG Flight I and II except: Embarked helicopters Kingfisher mine avoidance sonar CEC (on some ships)</p>	<p>Same as DDG 51 Flight I and II except: Embarked helicopter(s) DDG 85 and later have one CIWS No Harpoon</p>
LCS	<p>TRS-3D/16-ES MH-60R or MH-60S helicopters or Fire Scout (UAS) Link 16</p>	<p><u>Missiles</u> HELLFIRES from the MH-60R or MH-60S helicopters RAM</p> <p><u>Guns</u> 57mm gun (MK 110) .50 caliber machine guns Undersea Warfare Degaussing</p>

Appendix D. Capabilities Table

TYPE	SENSORS	WEAPONS
AIRCRAFT		
MH-60R Sea Hawk Cruise Speed: 120 knots Endurance: 4 hours	<u>Radar—multimode</u> Inverse synthetic aperture radar Automatic radar periscope detection and discrimination system Sensor FLIR with laser designator/range finder Electronic detection Dipping Sonar <u>Comms</u> VHF/UHF secure radios HAVE QUICK Hawklink DAMA SATCOM Link 16	<u>Torpedo</u> MK 46 or 54 torpedo <u>Missile</u> HELLFIREs Guns One 7.62mm (M-240D) or one .50 caliber (GAU-21) machine gun
MH-60S Knight Hawk Cruise Speed: 120 knots Endurance: 3 hours	<u>Sensor</u> FLIR with laser designator/range finder Comms: VHF/UHF secure radios HAVE QUICK DAMA SATCOM Live video feed Link 16	<u>Missiles/Rockets</u> HELLFIREs 2.75-inch rockets—LAU-61 C/A Guns .50 caliber (two GAU-21 machine guns) 7.62mm (two M-240D machine guns)
CH-53E Sea Stallion Cruise Speed: 150 knots Towing Speed: 25 knots	AN/AQS-24A sonar	MK 103 mechanical sweep MK 104 MOD 3 acoustic sweep MK 105 MOD 4 magnetic sweep MK 105A MK 2(G) magnetic and acoustic sweep MK 106 magnetic and acoustic sweep SPU-1/W magnetic sweep (inshore) SPU-1/W/A MK 2(G) sweep 37U-1 controlled deep sweep
AH-1Z Super Cobra Cruise Speed: 140 knots Endurance: 2¼ hours	Electrical-optical fire control system FLIR sensor (target sight system on the AH-1Z) Laser designator/rangefinder Comms UHF/VHF/anti-jam/secure radios Live video feed	Missiles/Rockets HELLFIREs Sidewinder missiles 2.75-inch rockets (HE, flechettes, Advanced Precision Kill Weapon System, etc.) 5-inch rockets Gun 20mm cannon (turret-mounted M197)

Appendix D. Capabilities Table

TYPE	SENSORS	WEAPONS
AIRCRAFT (cont.)		
UH-1Y Venom Cruise Speed: 120–140 knots Endurance: More than 2 hours	AAQ-22E BRITE Star Block II FLIR with laser designator/rangefinder Comms UHF/VHF/anti-jam/secure radios Live video feed C3 mission kit (mIRC)	<u>Rockets</u> 2.75-inch rockets (14) (HE, flechettes, Advanced Precision Kill Weapons System, etc.) <u>Gun</u> .50 caliber (GAU-21) 7.62mm Gatling gun (GAU-17/A) 7.62mm M-240D
AV-8B Harrier Cruise Speed: 480 knots Endurance: w/drop tanks 1-1½ hours	<u>Sensors</u> APG-65 air-air/air-surface radar FLIR Litening II targeting pod, a high-resolution FLIR sensor and laser designator equipped with expendables.	<u>Missiles and Rockets</u> 2.75-inch rockets 5-inch rockets AMRAAM (AIM-120) HARM (AGM-88) Harpoon (AGM-84) Sidewinders (AIM-9) Maverick missiles (AGM-65) <p style="text-align: right;"><u>Gun</u></p> 25mm (GAU-12) <u>Bombs</u> MK 82 500-pound general purpose bomb MK 83 1,000-pound general purpose bomb GBU-12 500-pound laser-guided bomb GBU-16 1,000- pound laser-guided bomb CBU-99/100 cluster bomb unit <u>Electronic Warfare:</u> Counterpulse jammer: ALQ-126B Counter-continuous wave: ALQ-162 Chaff and flares
F-35B Cruise Speed: 800 knots Endurance: w/drop tanks 2-2½ hours	<u>Radar</u> <u>FLIR</u> Comms Multifunction advanced data link (including Link 16)	<u>Internal</u> Four hard points for two missiles (AMRAAM, Sparrow, Sidewinder) and two bombs or four missiles <u>External</u> Four bomb hardpoints

Appendix E. Summary of Ships with Capability Shortfalls for Operations in Non-hostile Environments

	<i>Humanitarian and Civic Assistance</i>				<i>Security Force Assistance</i>				<i>Humanitarian Assistance/Disaster Relief</i>				<i>Counterdrug</i>			
	<i>Amphibious</i>		<i>Other</i>		<i>Amphibious</i>		<i>Other</i>		<i>Amphibious</i>		<i>Other</i>		<i>Amphibious</i>		<i>Other</i>	
	<i>Ships</i>	<i>CLF</i>	<i>MPF</i>	<i>Ships</i>	<i>Ships</i>	<i>CLF</i>	<i>MPF</i>	<i>Ships</i>	<i>Ships</i>	<i>CLF</i>	<i>MPF</i>	<i>Ships</i>	<i>Ships</i>	<i>CLF</i>	<i>MPF</i>	<i>Ships</i>
Breadth																
Surface capability	LHA-6	T-AO, T-AOE	<i>T-AKE,</i> <i>T-AK</i>	<i>T-AVB,</i> <i>T-AH</i>	LHA-6	T-AO, T-AOE	<i>T-AKE,</i> <i>T-AK,</i> <i>T-AKR</i>	<i>T-AVB,</i> <i>T-AH, JHSV,</i> <i>LCS-1,</i> <i>LCS-2</i>	LHA-6	T-AO, T-AOE	<i>T-AKE,</i> <i>T-AK, T-AKR</i>	<i>T-AVB,</i> <i>T-AH, JHSV,</i> <i>LCS-1, LCS-2</i>	LHA-6	T-AO, T-AOE	<i>T-AKE,</i> <i>T-AK</i>	<i>T-AVB, T-AH</i>
Air capability						T-AO	T-AKR	T-AVB	<i>LSD-41,</i> <i>LSD-49</i>	T-AO, T-AOE	<i>T-AKE,</i> <i>T-AK, T-AKR</i>	<i>T-AVB,</i> <i>T-AH, JHSV,</i> <i>LCS-1, LCS-2</i>		T-AO, T-AOE	<i>T-AKE,</i> <i>T-AK,</i> <i>T-AKR</i>	<i>T-AVB,</i> <i>T-AH, JHSV</i>
Projection																
Surface capacity									LHA-6	T-AO, T-AOE	<i>T-AKE</i>	<i>T-AVB,</i> <i>T-AH, JHSV,</i> <i>LCS-1, LCS-2</i>				
Air capacity							LPD-17, LSD-41, LSD-49		T-AO, T-AOE	<i>T-AKE,</i> <i>T-AK,</i> <i>T-AKR</i>	<i>T-AVB,</i> <i>T-AH, JHSV,</i> <i>LCS-1, LCS-2</i>					
Ashore water delivery									T-AO, T-AOE	<i>T-AKE,</i> <i>T-AKR</i>	<i>T-AVB, T-AH,</i> <i>LCS-1, LCS-2</i>					
Command and control									LPD-17, LSD-41, LSD-49	T-AO, T-AOE	<i>T-AKE,</i> <i>T-AK, T-AKR</i>	<i>T-AVB, T-AH,</i> <i>JHSV, LCS-1,</i> <i>LCS-2</i>	LSD-41, LSD-49	T-AO, T-AOE	<i>T-AKE,</i> <i>T-AK,</i> <i>T-AKR</i>	<i>T-AH</i>
Intelligence, surveillance, and reconnaissance (ISR)													LSD-41, LSD-49	T-AO, T-AOE	<i>T-AKE,</i> <i>T-AK,</i> <i>T-AKR</i>	<i>T-AVB,</i> <i>T-AH, JHSV</i>
Medical									LHA-6, LSD-41, LSD-49	T-AO, T-AOE	<i>T-AKE,</i> <i>T-AK, T-AKR</i>	<i>T-AVB,</i> <i>JHSV, LCS-1,</i> <i>LCS-2</i>				
Berthing space										T-AO, T-AOE	<i>T-AKE</i>	<i>LCS-1, LCS-2</i>				
Crew											<i>T-AK, T-AKR</i>	<i>T-AVB,</i> <i>LCS-2</i>		T-AO, T-AOE	<i>T-AKE,</i> <i>T-AK,</i> <i>T-AKR</i>	<i>T-AVB,</i> <i>T-AH, JHSV,</i> <i>LCS-2</i>

Notes: Italics indicate the ship meets the minimum capability requirement with limitations. CLF=Combat Logistics Force, MPF=Maritime Prepositioning Force.

Appendix E. Summary of Ships with Capability Shortfalls for Operations in Non-hostile Environments

	<i>Foreign Internal Defense</i>				<i>Maritime Intercept Operations</i>			
	<i>Amphibious Ships</i>	<i>CLF</i>	<i>MPF</i>	<i>Other Ships</i>	<i>Amphibious Ships</i>	<i>CLF</i>	<i>MPF</i>	<i>Other Ships</i>
Survivability								
Susceptibility		T-AO, T-AOE	T-AKE, T-AK, T-AKR,	T-AVB, T-AH, JHSV		T-AO, T-AOE	T-AKE, T-AK, T-AKR	T-AVB, T-AH, JHSV
Vulnerability						T-AO, T-AOE	T-AKE, T-AK, T-AKR,	T-AVB, T-AH, JHSV, LCS-1, LCS-2
Breadth								
Surface capability	LHA-6	T-AO, T-AOE	<i>T-AKE, T-AK</i>	<i>T-AVB, T-AH</i>	LHA-6	T-AO, T-AOE	<i>T-AKE, T-AK</i>	<i>T-AVB, T-AH</i>
Air capability		T-AO, T-AOE	<i>T-AKE, T-AK, T-AKR</i>	<i>T-AVB, JHSV</i>		T-AO, T-AOE	<i>T-AKE, T-AK, T-AKR</i>	<i>T-AVB, T-AH, JHSV</i>
Projection								
Air capacity	LSD-41, LSD-49	T-AO	T-AKE, T-AK, T-AKR	T-AVB, T-AH, JHSV, LCS-1, LCS-2	LSD-41, LSD-49	T-AO	T-AKE, T-AK, T-AKR	T-AVB, T-AH, JHSV, LCS-1, LCS-2
Command and control	LSD-41, LSD-49	T-AO, T-AOE	T-AKE, T-AK, T-AKR	T-AH	LSD-41, LSD-49	T-AO, T-AOE	T-AKE, T-AK, T-AKR	T-AH
Intelligence, surveillance, and reconnaissance (ISR)	LSD-41, LSD-49	T-AO, T-AOE	T-AKE, T-AK, T-AKR	<i>T-AVB, T-AH, JHSV</i>	LSD-41, LSD-49	T-AO, T-AOE	T-AKE, T-AK, T-AKR	<i>T-AVB, T-AH, JHSV</i>
Medical		T-AO, T-AOE	T-AKE, T-AK, T-AKR	T-AVB, JHSV, LCS-1, LCS-2				
Berthing space		T-AO, T-AOE	T-AKE	LCS-1, LCS-2				
Ship self-protection		T-AO, T-AOE	T-AKE, T-AK, T-AKR	T-AVB, T-AH, JHSV		T-AO, T-AOE	T-AKE, T-AK, T-AKR	T-AVB, T-AH, JHSV
Crew			T-AK, T-AKR	T-AVB, LCS-2		T-AO, T-AOE	T-AKE, T-AK, T-AKR	T-AVB, T-AH, JHSV, LCS-2

Notes: Italics indicate the ship meets the minimum capability requirement with limitations. CLF = Combat Logistics Force, MPF = Maritime Prepositioning Force.

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

			US Aircraft										Australian Aircraft						
			Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	S-70B-2	MH-60R	CH-47	Tiger ARH	NH-90	
US Ships	LHD	Spots	8-10																
		Hangar capacity	29 total																
	LHA 6-7	Spots	9																
		Hangar capacity	29 total																
	LHA 8	Spots	9																
		Hangar capacity	29 total																
	LPD-17	Spots	2 or 4																
		Hangar capacity	1 MV-22																
	LSD 41-48	Spots	2																
		Hangar capacity	No																
	LSD-49-52	Spots	2																
		Hangar capacity	No																
	ESD(MLP)	Spots	1																
		Hangar capacity	No																
	AFSB (MLP)	Spots	2/4																
		Hangar capacity	Yes																
	T-AKE	Spots	1																
		Hangar capacity	2 SH-60s																
	T-AKR 304, (Bob Hope Class)	Spots	1																
		Hangar capacity	No																
	T-AKR 311, 312, LMSR (Watson Class)	Spots	1																
		Hangar capacity	No																
	T-AK 3008-3012 (Bobo class)	Spots	1																
		Hangar capacity	No																
	T-AK 3017	Spots	1																
		Hangar capacity	No																
	T-AVB	Spots	1																
		Hangar capacity	No																
LCC	Spots	1																	
	Hangar capacity	No																	
LCS 1 LM (steel)	Spots	1																	
	Hangar capacity	1																	
LCS 2 GD (aluminum)	Spots	1																	
	Hangar capacity	2																	
EPF (JHSV)	Spots	1																	
	Hangar capacity	No																	
T-AG 5001 (OPDS)	Spots	N/A																	
	Hangar capacity	N/A																	
Australian Ships	LHD (Canberra Class)	Spots	4 or 6																
		Hangar capacity	18 (max)																
	LSD (Choules Class)	Spots	2																
		Hangar capacity	N/A																
	FFH (ANZAC Class)	Spots	1																
		Hangar capacity	N/A																
	HMAS Sirius AOR	Spots	1																
		Hangar capacity	N/A																
	HMAS Success II (Durance Class)	Spots	1																
		Hangar capacity	N/A																

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom
- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors											Australian Surface Connectors					
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	LCM-1E(LLC)	LCM-8	LCVP	LARC
US Ships	LHD	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LHA 6-7	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LHA 8	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LPD-17	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LSD 41-48	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LSD 49-52	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	ESD (MLP)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	AFSB MLP	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AKE	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AKR 304 LMSR (Bob Hope Class)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AKR 311,312 LMSR (Watson Class)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AK 3008-3012 (Bobo class)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AK 3017 (Stockham)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AVB	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LCC	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LCS 1 LM (steel)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LCS 2 GD (aluminum)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
EPF (JHSV)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
T-AG 5001 (OPDS)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
Australian Ships	LHD (Canberra Class)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LSD (Choules Class)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	FFH (ANZAC Class)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	HMAS Sirius AOR	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	HMAS Success II (Durance Class)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock
- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

		US Aircraft											Bangladesh Aircraft		
		Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	AW109 Power	Bell 206L-4 Long Ranger IV (BA)	AS 365 Dauphin (BA)
US Ships	LHD	Spots	8-10												
	Hangar capacity	29 total													
	LHA 6-7	Spots	9												
	Hangar capacity	29 total													
	LHA 8	Spots	9												
	Hangar capacity	29 total													
	LPD-17	Spots	2 or 4												
	Hangar capacity	1 MV-22													
	LSD 41-48	Spots	2												
	Hangar capacity	No													
	LSD-49-52	Spots	2												
	Hangar capacity	No													
	ESD (MLP)	Spots	1												
	Hangar capacity	No													
	AFSB (MLP)	Spots	2/4												
	Hangar capacity	Yes													
	T-AKE	Spots	1												
	Hangar capacity	2 SH-60s													
	T-AKR 304 LMSR (Bob Hope Class)	Spots	1												
	Hangar capacity	No													
T-AKR 311,312 LMSR (Watson Class)	Spots	1													
Hangar capacity	No														
T-AK 3008-3012 (Bobo class)	Spots	1													
Hangar capacity	No														
T-AK 3017 (Stockham)	Spots	1													
Hangar capacity	No														
T-AVB	Spots	1													
Hangar capacity	No														
LCC	Spots	1													
Hangar capacity	No														
LCS 1 LM (steel)	Spots	1													
Hangar capacity	1														
LCS 2 GD (aluminum)	Spots	1													
Hangar capacity	2														
EPF (JHSV)	Spots	1													
Hangar capacity	No														
T-AG 5001 (OPDS)	Spots	N/A													
Hangar capacity	N/A														
Bangladesh Ships	Modified Ulsan Class Frigate	Spots	1												
	Hangar capacity														
	Hamilton Class Frigate	Spots	1												
	Hangar capacity	1													
Type 053H2 Frigate	Spots	0													
Hangar capacity	0														

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom
- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface

		US Surface Connectors												BN Surface Connectors					
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	Shah Amanat-class Landing Craft (Logistics)	LCU 1512	Yuch'in-class (Type 068/069) LCU/LCM	LCT (Army)	LCVP
US Ships	LHD	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LHA 6-7	Yellow	Yellow	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Orange	Yellow	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LHA 8	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Orange	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
	LPD-17	Green	Yellow	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LSD 41-48	Green	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LSD-49-52	Green	Green	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	ESD (MLP)	Green	Yellow	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	AFSB MLP	Orange	Yellow	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	T-AKE	Orange	Green	Orange	Orange	Yellow	Yellow	Yellow	Orange	Yellow	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	T-AKR 304 LMSR (Bob Hope Class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Orange	Yellow	Green	Green	Yellow	Orange	Orange	Orange	Orange	Orange	Orange
	T-AKR 311,312 LMSR (Watson Class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Orange	Yellow	Green	Green	Yellow	Orange	Orange	Orange	Orange	Orange	Orange
	T-AK 3008-3012 (Bobo class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Orange	Yellow	Green	Green	Yellow	Orange	Orange	Orange	Orange	Orange	Orange
	T-AK 3017 (Stockham)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Orange	Yellow	Green	Green	Yellow	Orange	Orange	Orange	Orange	Orange	Orange
	T-AVB	Orange	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LLC	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LCS 1 LM (steel)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
LCS 2 GD (aluminum)	Grey	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	
EPF (JHSV)	Green	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Yellow	Orange	Yellow	Orange	Orange	Orange	Orange	Orange	Orange	
T-AG 5001 (OPDS)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	
BNShips	Modified Ulsan Class Frigate (includes flagship BNS Bangabandhu)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	
	Hamilton Class Frigate (includes BNS Somudra Joy)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	
	Jianghu III (Type 053 H2) frigate (includes BNS Abu Bakr)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	

Green	Fully Interoperable
Yellow	Limited
Orange	Not Operable
Grey	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR – RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

			US Aircraft										
			Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B
US Ships	LHD	Spots	8-10										
		Hangar capacity	29 total										
	LHA 6-7	Spots	9										
		Hangar capacity	29 total										
	LHA 8	Spots	9										
		Hangar capacity	29 total										
	LPD-17	Spots	2 or 4										
		Hangar capacity	1 MV-22										
	LSD 41-48	Spots	2										
		Hangar capacity	No										
	LSD-49-52	Spots	2										
		Hangar capacity	No										
	ESD (MLP)	Spots	1										
		Hangar capacity	No										
	AFSB (MLP)	Spots	2/4										
		Hangar capacity	Yes										
	T-AKE	Spots	1										
		Hangar capacity	2 SH-60s										
	T-AKR 304 LMSR (Bob Hope Class)	Spots	1										
		Hangar capacity	No										
T-AKR 311,312 LMSR (Watson Class)	Spots	1											
	Hangar capacity	No											
T-AK 3008-3012 (Bobo class)	Spots	1											
	Hangar capacity	No											
T-AK 3017 (Stockham)	Spots	1											
	Hangar capacity	No											
T-AVB	Spots	1											
	Hangar capacity	No											
LCC	Spots	1											
	Hangar capacity	No											
LCS 1 LM (steel)	Spots	1											
	Hangar capacity	1											
LCS 2 GC (aluminum)	Spots	1											
	Hangar capacity	2											
EPF (JHSV)	Spots	1											
	Hangar capacity	No											
T-AG 5001 (OPDS)	Spots	N/A											
	Hangar capacity	N/A											
Cambodian Ships	RO/ROs	Spots											
		Hangar capacity	N/A										

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom
- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors												Cambodian Surface Connectors		
	Platform	RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	LCM-8	LCM-6
US Ships	LHD	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Grey	Grey
	LHA 6-7	Yellow	Yellow	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Orange	Yellow	Orange	Orange	Grey	Grey
	LHA 8	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Orange	Grey	Grey	Orange	Grey	Grey
	LPD-17	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Green	Orange	Yellow	Green	Orange	Grey	Grey
	LSD 41-48	Green	Green	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Grey	Grey
	LSD-49-52	Green	Green	Orange	Green	Green	Yellow	Green	Green	Green	Orange	Yellow	Green	Orange	Grey	Grey
	ESD (MLP)	Green	Yellow	Green	Green	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Yellow	Orange	Grey	Grey
	AFSB MLP	Orange	Yellow	Orange	Orange	Grey	Grey	Grey	Grey	Grey	Orange	Grey	Orange	Orange	Grey	Grey
	T-AKE	Orange	Green	Orange	Orange	Yellow	Yellow	Yellow	Orange	Yellow	Yellow	Orange	Grey	Grey	Yellow	Grey
	T-AKR 304 LMSR (Bob Hope Class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange	Yellow	Grey
	T-AKR 311, 312 LMSR (Watson Class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange	Yellow	Grey
	T-AK 3008-3012 (Bobo class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Green	Yellow	Grey
	T-AK 3017 (Stockham)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange	Yellow	Grey
	T-AVB	Orange	Green	Orange	Orange	Grey	Grey	Grey	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Grey
	LCC	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LCS 1 LM (steel)	Grey	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LCS 2 GD (aluminum)	Grey	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
EPF (IHSV)	Green	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Yellow	Orange	Yellow	Orange	Orange	
T-AG 5001 (OPDS)	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	
Cambodian Ships	RO/ROs	Green	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

			US Aircraft										Canadian Aircraft			
			Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	SH-3A (CH-124) Sea King	H-92 Superhawk (CH-148 Cyclone)	
US Ships	LHD	Spots	8-10													
		Hangar capacity	29 total													
	LHA 6-7	Spots	9													
		Hangar capacity	29 total													
	LHA 8	Spots	9													
		Hangar capacity	29 total													
	LPD-17	Spots	2 or 4													
		Hangar capacity	1 MV-22													
	LSD 41-48	Spots	2													
		Hangar capacity	No													
	LSD-49-52	Spots	2													
		Hangar capacity	No													
	ESD (MLP)	Spots	1													
		Hangar capacity	No													
	AFSB (MLP)	Spots	2/4													
		Hangar capacity	Yes													
	T-AKE	Spots	1													
		Hangar capacity	2 SH-60s													
	T-AKR 304 LMSR (Bob Hope Class)	Spots	1													
		Hangar capacity	No													
	T-AKR 311,312 LMSR (Watson Class)	Spots	1													
		Hangar capacity	No													
	T-AK 3008-3012 (Bobo class)	Spots	1													
		Hangar capacity	No													
T-AK 3017 (Stockham)	Spots	1														
	Hangar capacity	No														
T-AVB	Spots	1														
	Hangar capacity	No														
LCC	Spots	1														
	Hangar capacity	No														
LCS 1 LM (steel)	Spots	1														
	Hangar capacity	1														
LCS 2 GD (aluminum)	Spots	1														
	Hangar capacity	2														
EPF (JHSV)	Spots	1														
	Hangar capacity	No														
T-AG 5001 (OPDS)	Spots	N/A														
	Hangar capacity	N/A														
Canadian Ships	Frigate (Halifax Class)	Spots	1													
		Hangar capacity	N/A													
	Destroyer (Iroquois Class)	Spots	2													
		Hangar capacity	N/A													
Patrol Vessel (Kingston Class)	Spots	0														
	Hangar capacity	N/A														

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors												
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS
US Ships	LHD	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LHA 6-7	Yellow	Yellow	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Orange	Yellow	Orange	Orange
	LHA 8	Green	Green	Green	Green	Green	Green	Green	Green	Green	Orange	Green	Orange	Orange
	LPD-17	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Green	Orange	Yellow	Green	Orange
	LSD 41-48	Green	Green	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange
	LSD 49-52	Green	Green	Orange	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange
	ESD (MLP)	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange
	AFSB MLP	Orange	Yellow	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange
	T-AKE	Orange	Green	Orange	Orange	Yellow	Yellow	Yellow	Orange	Yellow	Orange	Green	Orange	Green
	T-AKR 304 LMSR (Bob Hope Class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange
	T-AKR 311,312 LMSR (Watson Class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange
	T-AK 3008-3012 (Bobo class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Green
	T-AK 3017 (Stockham)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange
	T-AVB	Orange	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LCC	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LCS 1 LM (steel)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LCS 2 GD (aluminum)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
EPF (JHSV)	Green	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Yellow	Orange	Yellow	Orange	
T-AG 5001 (OPDS)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	
Canadian Ships	Frigate (Halifax Class)	Orange	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Yellow	Orange	Green	
	Destroyer (Iroquois Class)	Orange	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Yellow	Orange	Green	
	Patrol Vessel (Kingston Class)	Orange	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Yellow	Orange	Green	

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

			US Aircraft									Chilean Aircraft				
			Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	AS 332	Bell 206	BO 105
US Ships	LHD	Spots	8-10													
		Hangar capacity	29 total													
	LHA 6-7	Spots	9													
		Hangar capacity	29 total													
	LHA 8	Spots	9													
		Hangar capacity	29 total													
	LPD-17	Spots	2 or 4													
		Hangar capacity	1 MV-22													
	LSD 41-48	Spots	2													
		Hangar capacity	No													
	LSD-49-52	Spots	2													
		Hangar capacity	No													
	ESD (MLP)	Spots	1													
		Hangar capacity	No													
	AFSB MLP	Spots	2/4													
		Hangar capacity	Yes													
	T-AKE	Spots	1													
		Hangar capacity	2 SH-60s													
	T-AKR 304 LMSR (Bob Hope Class)	Spots	1													
		Hangar capacity	No													
	T-AKR 311,312 LMSR (Watson)	Spots	1													
		Hangar capacity	No													
	T-AK 3008-3012 (Bobo class)	Spots	1													
		Hangar capacity	No													
	T-AK 3017 (Stockham)	Spots	1													
		Hangar capacity	No													
	T-AVB	Spots	1													
		Hangar capacity	No													
LCC	Spots	1														
	Hangar capacity	No														
LCS 1 LM (steel)	Spots	1														
	Hangar capacity	1														
LCS 2 GC (aluminum)	Spots	1														
	Hangar capacity	2														
EPF (JHSV)	Spots	1														
	Hangar capacity	No														
T-AG 5001 (OPDS)	Spots	N/A														
	Hangar capacity	N/A														
Chilean ships	LPD (Foudre class)	Spots	3													
		Hangar capacity	3													
	LST (Batral class)	Spots	1 (landing)													
		Hangar capacity	No hangar													
	UNREP (Henry J. Kaiser class - T-AO)	Spots	Helicopter													
		Hangar capacity	No hangar													
	UNREP (Araucano class)	Spots														
		Hangar capacity	N/A													
	Transport ship (Aguiles class)	Spots	Yes - medium													
		Hangar capacity	N/A													

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors													Chilean Surface Connectors	
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	LCM (CTM)	LCU (CDIC)
US Ships	LHD	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange		
	LHA 6-7	Yellow	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange		
	LHA 8	Green	Green	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange		
	LPD-17	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange		
	LSD-41-48	Green	Green	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange		
	LSD-49-52	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange		
	ESD (MLP)	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange		
	AFSB MLP	Orange	Yellow	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange		
	T-AKE	Orange	Green	Orange	Orange	Yellow	Yellow	Yellow	Orange	Yellow	Orange	Yellow	Orange	Yellow		
	T-AKR 304 LMSR (Bob Hope Class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange		
	T-AKR 311,312 LMSR (Watson Class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange		
	T-AK 3008-3012 (Bobo class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Green		
	T-AK 3017 (Stockham)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange		
	T-AVB	Orange	Green	Orange	Orange	Green	Green	Green	Orange	Green	Orange	Yellow	Orange	Orange		
	LCC	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange		
	LCS 1 LM (steel)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange		
	LCS 2 GD (aluminum)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange		
EPF (JHSV)	Green	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Yellow	Orange	Yellow	Orange			
T-AG 5001 (OPDS)	Green	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Yellow	Orange	Yellow	Orange			
Chilean Ships	LPD (Foudre class)					Green	Green	Green	Green			Green		Green	Green	
	LST (Batral class)															
	UNREP (Henry J. Kaiser class)															
	UNREP (Araucano class)															
	Transport Ship (Aguiles class)															
RO/RO																

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF – Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

		US Aircraft										Columbian Aircraft							
		Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	Bell 412	BO 105	UH-1	AS 355	BK 117	Bell 212	
US Ships	LHD	Spots	8-10																
		Hangar capacity	29 total																
	LHA 6-7	Spots	9																
		Hangar capacity	29 total																
	LHA 8	Spots	9																
		Hangar capacity	29 total																
	LPD-17	Spots	2 or 4																
		Hangar capacity	1 MV-22																
	LSD 41-48	Spots	2																
		Hangar capacity	No																
	LSD 49-52	Spots	2																
		Hangar capacity	No																
	ESD (MLP)	Spots	1																
		Hangar capacity	No																
	AFSB MLP	Spots	2/4																
		Hangar capacity	Yes																
	T-AKE	Spots	1																
		Hangar capacity	2 SH-60s																
	T-AKR 304 LMSR (Bob Hope Class)	Spots	1																
		Hangar capacity	No																
	T-AKR 311,312 LMSR (Watson)	Spots	1																
		Hangar capacity	No																
	T-AK 3008-3012 (Bobo class)	Spots	1																
		Hangar capacity	No																
	T-AK 3017 (Stockham)	Spots	1																
		Hangar capacity	No																
	T-AVB	Spots	1																
		Hangar capacity	No																
LCC	Spots	1																	
	Hangar capacity	No																	
LCS 1 LM (steel)	Spots	1																	
	Hangar capacity	1																	
LCS 2 GC (aluminum)	Spots	1																	
	Hangar capacity	2																	
EPF (JHSV)	Spots	1																	
	Hangar capacity	No																	
T-AG 5001 (OPDS)	Spots	N/A																	
	Hangar capacity	N/A																	
Columbian Ships	Landing Ship Dock (LSD) (7000-8000 DWT)	Spots	2																
		Hangar capacity																	
	OPV-80	Spots																	
		Hangar capacity																	

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors													Colombian Surface Connectors			
	Platform	RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	Amphibious Landing Vessel /LCU (BDA /COTECMAR)	LCU 1466A (Morrosquillo)	Hovercraft/LCAC (Griffon 2000TD)	
	US Ships	LHD																
LHA 6-7																		
LHA 8																		
LPD-17																		
LSD 41-48																		
LSD-49-52																		
ESD (MLP)																		
AFSB MLP																		
T-AKE																		
T-AKR 304 LMSR (Bob Hope Class)																		
T-AKR 311,312 LMSR (Watson Class)																		
T-AK 3008-3012 (Bobo class)																		
T-AK 3017 (Stockham)																		
T-AVB																		
LCC																		
LCS 1 LM (steel)																		
LCS 2 GD (aluminum)																		
EPF (IHSV)																		
T-AG 5001 (OPDS)																		
Colombian Ships	Landing Ship Dock (LSD) (7,000-8,000 DWT)*																	
	OPV-80																	



- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock
- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxilliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

		US Aircraft										French aircraft						
		Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	NH 90 Caiman	AS 332 Super Puma	SA 316 Alouette III	AS 365 Dauphin	Lynx	AS 565
US Ships	LHD	Spots	8-10															
		Hangar capacity	29 total															
	LHA 6-7	Spots	9															
		Hangar capacity	29 total															
	LHA 8	Spots	9															
		Hangar capacity	29 total															
	LPD-17	Spots	2 or 4															
		Hangar capacity	1 MV-22															
	LSD 41-48	Spots	2															
		Hangar capacity	No															
	LSD 49-52	Spots	2															
		Hangar capacity	No															
	ESD (MLP)	Spots	1															
		Hangar capacity	No															
	AFSB (MLP)	Spots	2/4															
		Hangar capacity	Yes															
	T-AKE	Spots	1															
		Hangar capacity	2 SH-60s															
	T-AKR 304 LMSR (Bob Hope Class)	Spots	1															
		Hangar capacity	No															
T-AKR 311,312 LMSR (Watson Class)	Spots	1																
	Hangar capacity	No																
T-AK 3008-3012 (Bobo class)	Spots	1																
	Hangar capacity	No																
T-AK 3017 (Stockham)	Spots	1																
	Hangar capacity	No																
T-AVB	Spots	1																
	Hangar capacity	No																
LCC	Spots	1																
	Hangar capacity	No																
LCS 1 LM (steel)	Spots	1																
	Hangar capacity	1																
LCS 2 GD (aluminum)	Spots	1																
	Hangar capacity	2																
EPF (JHSV)	Spots	1																
	Hangar capacity	No																
T-AG 5001 (OPDS)	Spots	N/A																
	Hangar capacity	N/A																
French Ships	Mistral class helicopter landing ship	Spots	6															
		Hangar capacity	16															
	BATRAL-type CHAMPLAIN-class transports	Spots	1															
		Hangar capacity																
	Gapeau Transport Landing Ship	Spots																
		Hangar capacity																
Chamois class (supply tender/logships)	Spots																	
	Hangar capacity																	
D'Entrecasteaux (B2M) class	Spots																	
	Hangar capacity																	

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors												French Surface Connectors		
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	EDA-R amphibious landing craft	CTM class (landing class mechanized (LCM))
US Ships	LHD	Green	Yellow	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Green	Grey	Grey
	LHA 6-7	Yellow	Yellow	Orange	Orange	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Orange	Yellow	Grey
	LHA 8	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Orange	Grey	Grey	Orange	Grey	Grey	Grey
	LPD-17	Green	Yellow	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Green	Grey	Grey
	LSD 41-48	Green	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Yellow	Grey	Grey
	LSD 49-52	Green	Green	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Grey	Grey	Grey
	ESD (MLP)	Green	Yellow	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Grey	Grey	Grey
	AFSB MLP	Orange	Yellow	Orange	Orange	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Grey	Grey	Grey
	T-AKE	Orange	Green	Orange	Orange	Green	Green	Green	Orange	Yellow	Orange	Green	Orange	Yellow	Yellow	Grey
	T-AKR 304 LMSR (Bob Hope Class)	Green	Green	Orange	Orange	Green	Green	Green	Green	Yellow	Green	Green	Orange	Yellow	Yellow	Grey
	T-AKR 311,312 LMSR (Watson Class)	Green	Green	Orange	Orange	Green	Green	Green	Green	Yellow	Green	Green	Orange	Yellow	Yellow	Grey
	T-AK 3008-3012 (Bobo class)	Green	Green	Orange	Orange	Green	Green	Green	Green	Yellow	Green	Green	Orange	Yellow	Yellow	Grey
	T-AK 3017 (Stockham)	Green	Green	Orange	Orange	Green	Green	Green	Green	Yellow	Green	Green	Orange	Yellow	Yellow	Grey
	T-AVB	Orange	Green	Orange	Orange	Green	Green	Green	Orange	Grey	Orange	Grey	Orange	Orange	Grey	Grey
	LCC	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Grey
	LCS 1 LM (steel)	Grey	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Grey
	LCS 2 GD (aluminum)	Grey	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Grey
EPF (JHSV)	Green	Green	Green	Green	Green	Green	Green	Green	Yellow	Green	Green	Yellow	Green	Grey	Grey	
T-AG 5001 (OPDS)	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	
French	Mistral class helicopter landing ship	Green	Orange	Green	Green	Green	Green	Green	Orange	Orange	Orange	Orange	Orange	Green	Green	Green
	BATRAL-type CHAMPLAIN-class transports	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Orange	Orange	Green
	Gapeau Transport Landing Ship	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Orange	Orange	Orange
	Chamois class (supply tender/log ships)	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Orange	Orange	Orange
	D'Entrecasteaux (B2M) class	Green	Green	Green	Green	Green	Green	Green	Green	Orange	Orange	Orange	Orange	Orange	Orange	Green

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

			US Aircraft										Indian Aircraft							
			Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	SA 319B / HAL Chetak	Sea King Mk 42	Sea King Mk 42A	Sea King Mk 42B	Sea King Mk 42C	Heron 2 UAV	SearcherII UAV
US Ships	LHD	Spots	8-10																	
		Hangar capacity	29 total																	
	LHA 6-7	Spots	9																	
		Hangar capacity	29 total																	
	LHA 8	Spots	9																	
		Hangar capacity	29 total																	
	LPD-17	Spots	2 or 4																	
		Hangar capacity	1 MV-22																	
	LSD 41-48	Spots	2																	
		Hangar capacity	No																	
	LSD 49-52	Spots	2																	
		Hangar capacity	No																	
	ESD (MLP)	Spots	1																	
		Hangar capacity	No																	
	AFSB (MLP)	Spots	2/4																	
		Hangar capacity	Yes																	
	T-AKE	Spots	1																	
		Hangar capacity	2 SH-60s																	
	T-AKR 304 LMSR (Bob Hope Class)	Spots	1																	
		Hangar capacity	No																	
T-AKR 311,312 LMSR (Watson Class)	Spots	1																		
	Hangar capacity	No																		
T-AK 3008-3012 (Bobo class)	Spots	1																		
	Hangar capacity	No																		
T-AK 3017 (Stockham)	Spots	1																		
	Hangar capacity	No																		
T-AVB	Spots	1																		
	Hangar capacity	No																		
LCC	Spots	1																		
	Hangar capacity	No																		
LCS 1 LM (steel)	Spots	1																		
	Hangar capacity	1																		
LCS 2 GD (aluminum)	Spots	1																		
	Hangar capacity	2																		
EPF (JHSV)	Spots	1																		
	Hangar capacity	No																		
T-G 5001 (OPDS)	Spots	N/A																		
	Hangar capacity	N/A																		
Indian Ships	Austin-Class LPD (INS Jalashwa L 41)	Spots	Up to 6 Sea King UH-3H																	
		Hangar capacity	1 Light Helo																	
	Magar Class LST	Spots	2																	
		Hangar capacity																		
	Kumbhir Class LST (Polnochny D class LSM)	Spots	1																	
		Hangar capacity	N/A																	
	Shardul Class LST	Spots	1 or 2																	
		Hangar capacity																		
	Deepak-class fleet tanker / replenishment ship	Spots	1																	
		Hangar capacity																		
	Jyoti-class replenishment tanker	Spots	1																	
		Hangar capacity																		
	Aditya-class replenishment/repair ship	Spots	1																	
		Hangar capacity																		
	Nicobar Class transport ship	Spots	1																	
		Hangar capacity																		
	INS Lakshadweep Hospital Ship	Spots	N/A																	
		Hangar capacity	N/A																	

Fully Interoperable
 Limited
 Not Operable
 No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

Platform	US Surface Connectors													Indian Surface Connectors			
	RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	Griffon 8000 TD Hovercraft (Coast Guard)	LCM 8 type	Vasco da Gama Class 10 Mk 3 LCU/LSM	15.5 m LCVF
LHD																	
LHA 6-7																	
LHA 8																	
LPD-17																	
LSD 41-48																	
LPD-49-52																	
ESD (MLP)																	
AFSB MLP																	
T-AKE																	
T-AKR 304 LMSR (Bob Hope Class)																	
T-AKR 311,312 LMSR (Watson Class)																	
T-AK 3008-3012 (Bobo class)																	
T-AK 3017 (Stockham)																	
T-AVB																	
LLC																	
LCS 1 LM (steel)																	
LCS 2 GD (aluminum)																	
EPF (JHSV)																	
T-AG 5001 (OPDS)																	
Austin-Class LPD (INS Jalashwa L 41)																	
Magar Class LST																	
Kumbhir Class LST (Polnochny D class LSM)																	
Shardul Class LST																	
Deepak-class fleet tanker / replenishment ship																	
Jyoti-class replenishment tanker																	
Aditya-class replenishment/ repair ship																	
Nicobar-class transport ship																	
INS Lakshadweep Hospital Ship																	

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

			US Aircraft										Indonesian Aircraft				
			Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	Mi-17	NB-412S	NAS-332	EC-120EB
US Ships	LHD	Spots	8-10														
		Hangar capacity	29 total														
	LHA 6-7	Spots	9														
		Hangar capacity	29 total														
	LHA 8	Spots	9														
		Hangar capacity	29 total														
	LPD-17	Spots	2 or 4														
		Hangar capacity	1 MV-22														
	LSD 41-48	Spots	2														
		Hangar capacity	No														
	LSD-49	Spots	2														
		Hangar capacity	No														
	ESD (MLP)	Spots	1														
		Hangar capacity	No														
	AFSB (MLP)	Spots	2/4														
		Hangar capacity	Yes														
	T-AKE	Spots	1														
		Hangar capacity	2 SH-60s														
	T-AKR 304 LMSR (Bob Hope Class)	Spots	1														
		Hangar capacity	No														
	T-AKR 311,312 LMSR (Watson Class)	Spots	1														
		Hangar capacity	No														
	T-AK 3008-3012 (Bobo class)	Spots	1														
		Hangar capacity	No														
T-AK 3017 (Stockham)	Spots	1															
	Hangar capacity	No															
T-AVB	Spots	1															
	Hangar capacity	No															
LCC	Spots	1															
	Hangar capacity	No															
LCS 1 LM (steel)	Spots	1															
	Hangar capacity	1															
LCS 2 GD (aluminum)	Spots	1															
	Hangar capacity	2															
EPF (JHSV)	Spots	1															
	Hangar capacity	No															
T-AG 5001 (OPDS)	Spots	N/A															
	Hangar capacity	N/A															
Indonesian Ships	LPD (Makassar Class)	Spots	Up to 3														
		Hangar capacity	2 Super - Puma														
	LST	Spots	1														
		Hangar capacity	3 Super -Puma														
	LSTH	Spots	1														
Hangar capacity		Yes															
LPD/Hospital	Spots	2															
	Hangar capacity	Yes															

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors												Indonesian Surface Connectors		
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	LCU	LCVP
US Ships	LHD															
	LHA 6-7															
	LHA 8															
	LPD-17															
	LSD 41-48															
	LPD-49-52															
	ESD (MLP)															
	AFSB MLP															
	T-AKE															
	T-AKR 304 LMSR (Bob Hope Class)															
	T-AKR 311,312 LMSR (Watson Class)															
	T-AK 3008-3012 (Bobo class)															
	T-AK 3017 (Stockham)															
	T-AVB															
	LCC															
	LCS 1 LM (steel)															
	LCS 2 GD (aluminum)															
EPF (JHSV)																
T-AG 5001 (OPDS)																
Indonesian Ships	LPD (Makassar Class)															
	LST															
	LSTH															
	LPD/Hospital															

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

		US Aircraft											JGSDF/JMSDF Aircraft									
		Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	MV-22	AH-1	AH-64D	CH-47	SH-60J	SH-60K	MH-53	UH-1J		
US Ships	LHD	Spots	8-10																			
		Hangar capacity	29 total																			
	LHA 6-7	Spots	9																			
		Hangar capacity	29 total																			
	LHA 8	Spots	9																			
		Hangar capacity	29 total																			
	LPD-17	Spots	2 or 4																			
		Hangar capacity	1 MV-22																			
	LSD 41-48	Spots	2																			
		Hangar capacity	No																			
	LSD-49-52	Spots	2																			
		Hangar capacity	No																			
	ESD(MLP)	Spots	1																			
		Hangar capacity	No																			
	AFSB (MLP)	Spots	2/4																			
		Hangar capacity	Yes																			
	T-AKE	Spots	1																			
		Hangar capacity	2 SH-60k																			
	T-AKR 304 (Bob Hope Class)	Spots	1																			
		Hangar capacity	No																			
	T-AKR 311, 312, LMSR (Watson Class)	Spots	1																			
		Hangar capacity	No																			
	T-AK 3008-3012 (Bobo class)	Spots	1																			
	Hangar capacity	No																				
T-AK 3017 (Stockham)	Spots	1																				
	Hangar capacity	No																				
T-AVB 3,4	Spots	1																				
	Hangar capacity	No																				
LCC 19, 20	Spots	1																				
	Hangar capacity	No																				
LCS 1	Spots	1																				
	Hangar capacity	1																				
LCS 2	Spots	1																				
	Hangar capacity	2																				
EPF	Spots	1																				
	Hangar capacity	No																				
T-AG 5001 (OPDS)	Spots	N/A																				
	Hangar capacity	N/A																				
JMSDF Ships	DDH (Hyuga class)	Spots																				
		Hangar capacity	11																			
	DDH (Izumo class)	Spots	9																			
		Hangar capacity	14																			
	LST (Osumi class)	Spots	2																			
		Hangar capacity	no																			
AOE (Mashu class)	Spots	1																				
	Hangar capacity	1																				

Fully Interoperable
 Limited
 Not Operable
 No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors													JMSDF Surface Connectors	
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	LCAC	AAV 7
US Ships	LHD	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LHA 6-7	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LHA 8	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LPD-17	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LSD 41-48	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LSD-49-52	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	ESD (MLP)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	AFSB MLP	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AKE	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AKR 304 LMSR (Bob Hope Class)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AKR 311,312 LMSR (Watson Class)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AK 3008-3012 (Bobo class)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AK 3017 (Stockham)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AVB	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LCC	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LCS 1 LM (steel)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
LCS 2 GD (aluminum)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
EPF (JHSV)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
T-AG 5001 (OPDS)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
JMSDF Ships	DDH (Hyuga class)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
	DDH (Izumo class)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
	LST (Osumi class)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
	AOE (Mashu class)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

			US Aircraft									Royal Malaysian Navy Aircraft						
			Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH53-K	MV-22B	RQ-21	F-35B	Sikorsky S-61A	SRS 300 Lynx	UH-60A	AS 365 Dauphin	AS 565
US Ships	LHD	Spots	8-10															
		Hangar capacity	29 total															
	LHA 6-7	Spots	9															
		Hangar capacity	29 total															
	LHA 8	Spots	9															
		Hangar capacity	29 total															
	LPD-17	Spots	2 or 4															
		Hangar capacity	1 MV-22															
	LSD 41-48	Spots	2															
		Hangar capacity	No															
	LSD-49	Spots	2															
		Hangar capacity	No															
	ESD (MLP)	Spots	1															
		Hangar capacity	No															
	AFSB (MLP)	Spots	2/4															
		Hangar capacity	Yes															
	T-AKE	Spots	1															
		Hangar capacity	2 SH-60s															
	T-AKR 304, (Bob Hope Class)	Spots	1															
		Hangar capacity	No															
T-AKR 304 311,312, LMSR	Spots	1																
	Hangar capacity	No																
T-AKR 3008-3012 (Bobo Class)	Spots	1																
	Hangar capacity	No																
T-AK 3017	Spots	1																
	Hangar capacity	No																
T-AVB	Spots	1																
	Hangar capacity	No																
LCC	Spots	1																
	Hangar capacity	No																
LCS 1 LM (steel)	Spots	1																
	Hangar capacity	1																
LCS 3 GD (aluminum)	Spots	1																
	Hangar capacity	2																
EPF (JHSV)	Spots	1																
	Hangar capacity	No																
T-AG-5001(OPDS)	Spots	N/A																
	Hangar capacity	N/A																
Royal Malaysian Ships	KD Sri Indira Sakti and Mahawangsa multipurpose command support ships	Spots																
		Hangar capacity	N/A															
	Alligator Class LTSH	Spots																
		Hangar capacity	N/A															
	AP Fast troop vessel	Spots																
		Hangar capacity	N/A															
	RO/RO	Spots																
		Hangar capacity	N/A															
	Meko 100 Class	Spots																
		Hangar capacity	N/A															

Fully Interoperable
 Limited
 Not Operable
 No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors												
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS
US Ships	LHD	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LHA 6-7	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LHA 8	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LPD-17	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LSD 41-48	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LSD-49-52	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	ESD (MLP)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	AFSB MLP	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AKE	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AKR 304 LMSR (Bob Hope Class)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AKR 311,312 LMSR (Watson Class)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AK 3008-3012 (Bobo class)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AK 3017 (Stockham)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	T-AVB	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LCC	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LCS 1 LM (steel)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	LCS 2 GD (aluminum)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
EPF (JHSV)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
T-AG 5001 (OPDS)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
Royal Malaysian Ships	KD Sri Indira Sakti and Mahawangsa Multi purpose command support ships	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
	Alligator class LSTH	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
	AP Fast troop vessel	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
	RO/Ros	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
	Meko 100 Class	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock
- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

		US Aircraft											MMC/MCG Aircraft	
		Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	Dhruv/Rehendi ALH	
US Ships	LHD	Spots	8-10											
		Hangar capacity	29 total											
	LHA 6-7	Spots	9											
		Hangar capacity	29 total											
	LHA 8	Spots	9											
		Hangar capacity	29 total											
	LPD-17	Spots	2 or 4											
		Hangar capacity	1 MV-22											
	LSD 41-48	Spots	2											
		Hangar capacity	No											
	LSD-49-52	Spots	2											
		Hangar capacity	No											
	ESD (MLP)	Spots	1											
		Hangar capacity	No											
	AFSB (MLP)	Spots	2/4											
		Hangar capacity	Yes											
	T-AKE	Spots	1											
		Hangar capacity	2 SH-60s											
	T-AKR 304, (Bob Hope Class)	Spots	1											
		Hangar capacity	No											
	T-AKR 311, 312, LMSR (Watson Class)	Spots	1											
		Hangar capacity	No											
	T-AK 3008-3012 (Bobo class)	Spots	1											
		Hangar capacity	No											
	T-AK 3017	Spots	1											
		Hangar capacity	No											
	T-AVB	Spots	1											
		Hangar capacity	No											
LCC	Spots	1												
	Hangar capacity	No												
LCS 1 LM (steel)	Spots	1												
	Hangar capacity	1												
LCS 2 GD (aluminum)	Spots	1												
	Hangar capacity	2												
EPF (JHSV)	Spots	1												
	Hangar capacity	No												
T-AG 5001 (OPDS)	Spots	N/A												
	Hangar capacity	N/A												

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors													Maldives Surface Connectors	
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	Colombo Dockyard Landing Craft (1999)	Landing Craft (2014)
US Ships	LHD	Green	Yellow	Orange	Orange	Green	Yellow	Green	Green	Green	Orange	Yellow	Orange	Orange		
	LHA 6-7	Yellow	Orange	Orange	Orange	Yellow	Yellow	Green	Green	Green	Orange	Yellow	Orange	Orange		
	LHA 8	Green	Orange	Orange	Orange	Green	Yellow	Green	Green	Green	Orange	Yellow	Orange	Orange		
	LPD-17	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Green	Orange	Yellow	Green	Orange		
	LSD 41-48	Green	Green	Green	Green	Green	Yellow	Green	Green	Green	Orange	Yellow	Green	Orange		
	LSD-49-52	Green	Green	Orange	Green	Green	Yellow	Green	Green	Green	Orange	Yellow	Green	Orange		
	ESD (MLP)	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Green	Orange	Yellow	Green	Orange		
	AFSB MLP	Orange	Yellow	Green	Orange	Green	Yellow	Green	Green	Green	Orange	Yellow	Green	Orange		
	T-AKE	Orange	Green	Orange	Orange	Green	Yellow	Orange	Yellow	Yellow	Orange	Yellow	Orange	Orange		
	T-AKR 304 LMSR (Bob Hope Class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange		
	T-AKR 311,312 LMSR (Watson Class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange		
	T-AK 3008-3012 (Bobo class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Green		
	T-AK 3017 (Stockham)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange		
	T-AVB	Orange	Green	Orange	Orange	Green	Yellow	Orange	Orange	Orange	Orange	Orange	Orange	Orange		
	LCC	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange		
	LCS 1 LM (steel)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LCS 2 GD (aluminum)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
EPF (JHSV)	Green	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Yellow	Orange	Yellow	Orange	Orange	Orange	
T-AG 5001 (OPDS)	Green	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

		US Aircraft											Mexican aircraft								
		Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	S-70A Black Hawk	902	Mi-17	R44	BO 105	AS 555	AS 565	AS 332	
US Ships	LHD	Spots	8-10																		
		Hangar capacity	29 total																		
	LHA 6-7	Spots	9																		
		Hangar capacity	29 total																		
	LHA 8	Spots	9																		
		Hangar capacity	29 total																		
	LPD-17	Spots	2 or 4																		
		Hangar capacity	1 MV-22																		
	LSD 41-48	Spots	2																		
		Hangar capacity	No																		
	LSD 49-52	Spots	2																		
		Hangar capacity	No																		
	ESD (MLP)	Spots	1																		
		Hangar capacity	No																		
	AFSB MLP	Spots	2/4																		
		Hangar capacity	Yes																		
	T-AKE	Spots	1																		
		Hangar capacity	2 SH-60s																		
	T-AKR 304 LMSR (Bob Hope Class)	Spots	1																		
		Hangar capacity	No																		
	T-AKR 311,312 LMSR (Watson)	Spots	1																		
		Hangar capacity	No																		
	T-AK 3008-3012 (Bobo class)	Spots	1																		
		Hangar capacity	No																		
T-AK 3017 (Stockham)	Spots	1																			
	Hangar capacity	No																			
T-AVB	Spots	1																			
	Hangar capacity	No																			
LCC	Spots	1																			
	Hangar capacity	No																			
LCS 1 LM (steel)	Spots	1																			
	Hangar capacity	1																			
LCS 2 GC (aluminum)	Spots	1																			
	Hangar capacity	2																			
EPF (JHSV)	Spots	1																			
	Hangar capacity	No																			
T-AG 5001 (OPDS)	Spots	N/A																			
	Hangar capacity	N/A																			
Mexican ships	LST (Newport/Papaloapan class)	Spots	1																		
		Hangar capacity	Helicopter platform only																		
	Landing Ship (Montes Azules class)	Spots	1																		
		Hangar capacity	Helicopter platform only																		
RO/ROs	Spots																				
	Hangar capacity																				



- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		USSurfaceConnectors												
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS
US Ships	LHD	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Green	Orange	Yellow	Green	Orange
	LHA 6-7	Yellow	Orange	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Orange	Yellow	Orange	Orange
	LHA 8	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Orange	Grey	Grey	Grey
	LPD-17	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Green	Orange	Yellow	Green	Orange
	LSD 41-48	Green	Green	Green	Green	Green	Yellow	Green	Green	Green	Orange	Yellow	Green	Orange
	LSD-49-52	Green	Green	Orange	Green	Green	Yellow	Green	Green	Green	Orange	Yellow	Green	Orange
	ESD (MLP)	Green	Yellow	Green	Green	Grey	Grey	Grey	Grey	Grey	Orange	Grey	Yellow	Orange
	AFSB MLP	Orange	Yellow	Orange	Orange	Grey	Grey	Grey	Grey	Grey	Orange	Grey	Orange	Orange
	T-AKE	Orange	Green	Orange	Orange	Yellow	Yellow	Yellow	Orange	Yellow	Orange	Grey	Orange	Grey
	T-AKR 304 LMSR (Bob Hope Class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange
	T-AKR 311,312 LMSR (Watson Class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange
	T-AK 3008-3012 (Bobo Class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Green
	T-AK 3017 (Stockham)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange
	T-AVB	Orange	Green	Orange	Orange	Grey	Grey	Grey	Orange	Grey	Orange	Grey	Orange	Orange
	LCC	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LCS 1 LM (steel)	Grey	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LCS 2 GD (aluminum)	Grey	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
EPF (JHSV)	Green	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Yellow	Orange	Yellow	Orange	
T-AG 5001 (OPDS)	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	
Mexican Ships	LST (Newport/ Papaloapan class)	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
	Landing ship (Montes Azules class)	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
	RO/ROs	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF – Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

		US Aircraft										New Zealand Aircraft		
		Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	SH-2G	NH-90
LHA	LHD	Spots	8-10											
	Hangar capacity	29 total												
	LHA 6-7	Spots	9											
	Hangar capacity	29 total												
	LHA 8	Spots	9											
	Hangar capacity	29 total												
	LPD-17	Spots	2 or 4											
	Hangar capacity	1 MV-22												
	LSD 41-48	Spots	2											
	Hangar capacity	No												
	LSD-49-52	Spots	2											
	Hangar capacity	No												
	ESD (MLP)	Spots	1											
	Hangar capacity	No												
	AFSB (MLP)	Spots	2/4											
	Hangar capacity	Yes												
	T-AKE	Spots	1											
	Hangar capacity	2 SH-60s												
	T-AKR 304 LMSR (Bob Hope Class)	Spots	1											
	Hangar capacity	No												
	T-AKR 311,312 LMSR (Watson Class)	Spots	1											
	Hangar capacity	No												
	T-AK 3008-3012 (Bobo class)	Spots	1											
	Hangar capacity	No												
T-AK 3017 (Stockham)	Spots	1												
Hangar capacity	No													
T-AVB	Spots	1												
Hangar capacity	No													
LCC	Spots	1												
Hangar capacity	No													
LCS 1 LM (steel)	Spots	1												
Hangar capacity	1													
LCS 2 GD (aluminum)	Spots	1												
Hangar capacity	2													
EPF (JHSV)	Spots	1												
Hangar capacity	No													
T-AG 5001 (OPDS)	Spots	N/A												
Hangar capacity	N/A													
New Zealand Ships	Multi-Role Vessel (Canterbury Class)	Spots	1 to 2											
	Hangar capacity	4												
	Frigate (ANZAC Class)	Spots	1											
	Hangar capacity	N/A												
Replenishment Tank Endeavor	Spots	N/A												
Hangar capacity	N/A													

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors													New Zealand Surface Connectors
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	Landing Craft Medium
US Ships	LHD	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green
	LHA 6-7	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green
	LHA 8	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green
	LPD-17	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green
	LSD 41-48	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green
	LSD 49-52	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green
	ESD (MLP)	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green
	AFSB MLP	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green
	T-AKE	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green
	T-AKR 304 LMSR (Bob Hope Class)	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green
	T-AKR 311,312 LMSR (Watson Class)	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green
	T-AK 3008-3012 (Bobo class)	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green
	T-AK 3017 (Stockham)	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green
	T-AVB	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green
	LCC	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green
	LCS 1 LM (steel)	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green
LCS 2 GD (aluminum)	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green	
EPF (JHSV)	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green	
T-AG 5001 (OPDS)	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green	
New Zealand	Multi-Role Vessel (Canterbury Class)	Green	Green	Orange	Orange	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green	
	Frigate (ANZAC Class)	Green	Green	Orange	Orange	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green	
	Replenishment Tanker Endeavour	Green	Green	Orange	Orange	Green	Green	Green	Green	Orange	Yellow	Orange	Orange	Green	

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock
- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

			US Aircraft										Peruvian aircraft					
			Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	Sea King	Mi-8	Bell 212	Bell 412	SH-2G
US Ships	LHD	Spots	8-10															
		Hangar capacity	29 total															
	LHA 6-7	Spots	9															
		Hangar capacity	29 total															
	LHA 8	Spots	9															
		Hangar capacity	29 total															
	LPD-17	Spots	2 or 4															
		Hangar capacity	1 MV-22															
	LSD 41-48	Spots	2															
		Hangar capacity	No															
	LSD-49-52	Spots	2															
		Hangar capacity	No															
	ESD (MLP)	Spots	1															
		Hangar capacity	No															
	ASFB MLP	Spots	2/4															
		Hangar capacity	Yes															
	T-AKE	Spots	1															
		Hangar capacity	2 SH-60s															
	T-AKR 304 LMSR (Bob Hope Class)	Spots	1															
		Hangar capacity	No															
T-AKR 311,312 LMSR (Watson Class)	Spots	1																
	Hangar capacity	No																
T-AK 3008-3012 (Bobo class)	Spots	1																
	Hangar capacity	No																
T-AK 3017 (Stockham)	Spots	1																
	Hangar capacity	No																
T-AVB	Spots	1																
	Hangar capacity	No																
LCC	Spots	1																
	Hangar capacity	No																
LCS 1 LM (steel)	Spots	1																
	Hangar capacity	1																
LCS 2 GC (aluminum)	Spots	1																
	Hangar capacity	2																
EPF (IHSV)	Spots	1																
	Hangar capacity	No																
T-AG 5001 (OPDS)	Spots	N/A																
	Hangar capacity	N/A																
Peruvian Ships	LST (Terrebonne Parish class)	Spots	No															
		Hangar capacity	No															
	Replenishment (Amsterdam class)	Spots																
		Hangar capacity																
LPD (Makassar class)	Spots	2 (1 on deck & 1 on hangar)																
	Hangar capacity																	

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		USSurface Connectors												Peruvian Surface Connectors		
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	Hovercraft/LCAC (Griffon 2000TD)	LAVs
USShips	LHD															
	LHA 6-7															
	LHA 8															
	LPD-17															
	LSD 41-48															
	LSD-49-52															
	ESD (MLP)															
	AFSB MLP															
	T-AKE															
	T-AKR 304 LMSR (Bob Hope Class)															
	T-AKR 311,312 LMSR (Watson Class)															
	T-AK 3008-3012 (Bobo class)															
	T-AK 3017 (Stockham)															
	T-AVB															
	LCC															
	LCS 1 LM (steel)															
LCS 2 GD (aluminum)																
EPF (JHSV)																
T-AG 5001 (OPDS)																
Peruvian Ships	LST (Terrebonne Parish class)															
	Replenishment (Amsterdam class)															
	LPD (Makassar class)															

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF – Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

			US Aircraft										Aircraft of The Philippines		
			Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	BO-105C	AW109
US Ships	LHD	Spots	8-10												
		Hangar capacity	29 total												
	LHA 6-7	Spots	9												
		Hangar capacity	29 total												
	LHA 8	Spots	9												
		Hangar capacity	29 total												
	LPD-17	Spots	2 or 4												
		Hangar capacity	1 MV-22												
	LSD 41-48	Spots	2												
		Hangar capacity	No												
	LSD-49-52	Spots	2												
		Hangar capacity	No												
	ESD (MLP)	Spots	1												
		Hangar capacity	No												
	AFSB (MLP)	Spots	2/4												
		Hangar capacity	Yes												
	T-AKE	Spots	1												
		Hangar capacity	2 SH-60s												
	T-AKR 304, (Bob Hope Class)	Spots	1												
		Hangar capacity	No												
	T-AKR 311, 312, LMSR (Watson Class)	Spots	1												
		Hangar capacity	No												
	T-AK 3008-3012 (Bobo class)	Spots	1												
		Hangar capacity	No												
T-AK 3017 (Stockham)	Spots	1													
	Hangar capacity	No													
T-AVB	Spots	1													
	Hangar capacity	No													
LCC	Spots	1													
	Hangar capacity	No													
LCS 1 LM (steel)	Spots	1													
	Hangar capacity	1													
LCS 2 GD (aluminum)	Spots	1													
	Hangar capacity	2													
EPF (JHSV)	Spots	1													
	Hangar capacity	No													
T-AG 5001 (OPDS)	Spots	N/A													
	Hangar capacity	N/A													
Ships of The Philippines	Cutter (Gregorio del Pilar Class)	Spots	1												
		Hangar capacity	1 (Retractable)												
	Landing Platform Dock (Tarlac Class)	Spots	2												
		Hangar capacity	2												
	Landing Ship Tank (LST)	Spots	0												
		Hangar capacity	N/A												
Logistics Support Vessel	Spots	1													
	Hangar capacity	0													

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors											Surface Connectors of The Philippines				
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	Landing Craft Heavy (Ivatan)	Landing Craft Utility (Tagbanua)	LCM/LCU/LCT
US Ships	LHD	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Orange	Yellow	Green	Orange	Grey	Grey	Grey	Grey
	LHA 6-7	Yellow	Yellow	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Orange	Yellow	Orange	Orange	Grey	Grey	Grey	Grey
	LHA 8	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Orange	Grey	Grey	Orange	Grey	Grey	Grey	Grey
	LPD-17	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Orange	Yellow	Green	Orange	Grey	Grey	Grey	Grey
	LSD 41-48	Green	Green	Green	Green	Green	Yellow	Green	Green	Orange	Yellow	Green	Orange	Grey	Grey	Grey	Grey
	LSD-49-52	Green	Green	Orange	Green	Green	Yellow	Green	Green	Orange	Yellow	Green	Orange	Grey	Grey	Grey	Grey
	ESD (MLP)	Green	Yellow	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Grey	Grey	Grey	Grey
	AFSB MLP	Orange	Yellow	Orange	Orange	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Grey	Grey	Grey	Grey
	T-AKE	Orange	Green	Orange	Orange	Green	Green	Green	Orange	Yellow	Green	Green	Orange	Grey	Grey	Grey	Grey
	T-AKR 304 LMSR (Bob Hope Class)	Green	Green	Orange	Orange	Green	Green	Green	Orange	Yellow	Green	Green	Orange	Grey	Grey	Grey	Grey
	T-AKR 311,312 LMSR (Watson Class)	Green	Green	Orange	Orange	Green	Green	Green	Orange	Yellow	Green	Green	Orange	Grey	Grey	Grey	Grey
	T-AK 3008-3012 (Bobo class)	Green	Green	Orange	Orange	Green	Green	Green	Orange	Yellow	Green	Green	Orange	Grey	Grey	Grey	Grey
	T-AK 3017 (Stockham)	Green	Green	Orange	Orange	Green	Green	Green	Orange	Yellow	Green	Green	Orange	Grey	Grey	Grey	Grey
	T-AVB	Orange	Green	Orange	Orange	Green	Green	Green	Orange	Yellow	Green	Green	Orange	Grey	Grey	Grey	Grey
	LCC	Orange	Orange	Orange	Orange	Green	Green	Green	Orange	Yellow	Green	Green	Orange	Grey	Grey	Grey	Grey
LCS 1 LM (steel)	Grey	Orange	Orange	Orange	Green	Green	Green	Orange	Yellow	Green	Green	Orange	Grey	Grey	Grey	Grey	
LCS 2 GD (aluminum)	Grey	Orange	Orange	Orange	Green	Green	Green	Orange	Yellow	Green	Green	Orange	Grey	Grey	Grey	Grey	
EPF (JHSV)	Green	Green	Orange	Orange	Green	Green	Green	Orange	Yellow	Green	Green	Orange	Grey	Grey	Grey	Grey	
T-AG 5001 (OPDS)	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	
Philippines	Cutter (Gregorio del Pilar Class)	Orange	Grey	Grey	Orange	Grey	Grey	Orange	Grey	Orange	Orange	Orange	Orange	Grey	Grey	Grey	Grey
	Landing Platform Dock (Tarlac Class)	Grey	Grey	Grey	Grey	Green	Grey	Grey	Grey	Grey	Grey	Grey	Orange	Grey	Grey	Green	Green
	Landing Ship Tank (LST)	Grey	Grey	Grey	Orange	Grey	Grey	Grey	Grey	Grey	Orange	Grey	Orange	Grey	Grey	Grey	Grey
	Logistics Support Vessel (Bacolod City Class)	Grey	Grey	Grey	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange

Green	Fully Interoperable
Yellow	Limited
Orange	Not Operable
Grey	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock
- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

		US Aircraft											ROK Aircraft					
		Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	UH-60	UH-1	Alouette III	AW159	KUH-1 Surion	SH-60F
Us Ships	LHD	Spots	8-10															
	Hangar capacity	29 total																
	LHA 6-7	Spots	9															
	Hangar capacity	29 total																
	LHA 8	Spots	9															
	Hangar capacity	29 total																
	LPD-17	Spots	2 or 4															
	Hangar capacity	1 MV-22																
	LSD 41-48	Spots	2															
	Hangar capacity	No																
	LSD-49-52	Spots	2															
	Hangar capacity	No																
	ESD (MLP)	Spots	1															
	Hangar capacity	No																
	AFSB (MLP)	Spots	2/4															
	Hangar capacity	Yes																
	T-AKE	Spots	1															
	Hangar capacity	2 SH-60s																
	T-AKR 304 LMSR (Bob Hope Class)	Spots	1															
	Hangar capacity	No																
T-AKR 311,312 UMSR (Watson Class)	Spots	1																
Hangar capacity	No																	
T-AK 3008-3012 (Bobo class)	Spots	1																
Hangar capacity	No																	
T-AK 3017	Spots	1																
Hangar capacity	No																	
T-AVB	Spots	1																
Hangar capacity	No																	
LCC	Spots	1																
Hangar capacity	No																	
LCS 1 LM (steel)	Spots	1																
Hangar capacity	1																	
LCS 2 GD (aluminum)	Spots	1																
Hangar capacity	2																	
EPF (JHSV)	Spots	1																
Hangar capacity	No																	
T-AG 5001 (OPDS)	Spots	N/A																
Hangar capacity	N/A																	
ROK Ships	LP-X Dokdo	Spots	5															
	Hangar capacity																	
	Kojoonbong LST	Spots																
	Hangar capacity																	
	LST-2	Spots																
	Hangar capacity																	
ASR Chunghaejin	Spots																	
Hangar capacity	0																	
RO/ROs	Spots																	
Hangar capacity																		

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors												ROK Surface Connectors						
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	LSF	AAV 7	LTVP-7	LCM	LCVP	WLCMA
US Ships	LHD																			
	LHA 6-7																			
	LHA 8																			
	LPD-17																			
	LSD-41-48																			
	LSD-49-52																			
	ESD (MLP)																			
	AFSB MLP																			
	T-AKE																			
	T-AKR 304 LMSR (Bob Hope Class)																			
	T-AKR 311,312 LMSR (Watson Class)																			
	T-AK 3008-3012 (Bobo class)																			
	T-AK 3017 (Stockham)																			
	T-AVB																			
	LLC																			
	LCS 1 LM (steel)																			
LCS 2 GD (aluminum)																				
EPF (JHSV)																				
T-AG 5001 (OPDS)																				
ROK Ships	LP-X Dokdo																			
	Kojoonbong LST																			
	LST-2																			
	ASR Chunghaejin																			
	RO/ROs																			

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

		US Aircraft											Singapore Aircraft					
		Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	AH-64D Apache	AS-332 Super Puma	CH-47 Chinook	S-70B		
US Ships	LHD	Spots	8-10															
		Hangar capacity	29 total															
	LHA 6-7	Spots	9															
		Hangar capacity	29 total															
	LHA 8	Spots	9															
		Hangar capacity	29 total															
	LPD-17	Spots	2 or 4															
		Hangar capacity	1 MV-22															
	LSD 41-48	Spots	2															
		Hangar capacity	No															
	LSD-49	Spots	2															
		Hangar capacity	No															
	ESD (MLP)	Spots	1															
		Hangar capacity	No															
	AFSB (MLP)	Spots	2/4															
		Hangar capacity	Yes															
	T-AKE	Spots	1															
		Hangar capacity	2 SH-60s															
	T-AKR 304 LMSR (Bob Hope Class)	Spots	1															
		Hangar capacity	No															
	T-AKR 311,312 LMSR (Watson Class)	Spots	1															
		Hangar capacity	No															
	T-AK 3008-3012 (Bobo Class)	Spots	1															
		Hangar capacity	No															
	T-AK 3017 (Stockham)	Spots	1															
		Hangar capacity	No															
	T-AVB	Spots	1															
		Hangar capacity	No															
LCC	Spots	1																
	Hangar capacity	No																
LCS 1 LM (steel)	Spots	1																
	Hangar capacity	1																
LCS 2 GD (aluminum)	Spots	1																
	Hangar capacity	2																
EPF (JHSV)	Spots	1																
	Hangar capacity	No																
T-AG 5001 (OPDS)	Spots	N/A																
	Hangar capacity	N/A																
Singapore Ships	Endurance Class LPD/LST RO/ROs	Spots	2															
		Hangar capacity	2															
	Fearless Class PV	Spots	N/A															
		Hangar capacity	N/A															
	Independence Class PV	Spots	1															
		Hangar capacity	N/A															

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors												Singapore Surface Connectors			
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	LCU	LCVP	AMX-10P Marine APC
US Ships	LHD																
	LHA 6-7																
	LHA 8																
	LPD-17																
	LSD 41-48																
	LPD-49-52																
	ESD (MLP)																
	AFSB MLP																
	T-AKE																
	T-AKR 304 LMSR (Bob Hope Class)																
	T-AKR 311,312 LMSR (Watson Class)																
	T-AK 3008-3012 (Bobo class)																
	T-AK 3017 (Stockham)																
	T-AVB																
	LCC																
	LCS 1 LM (steel)																
	LCS 2 GD (aluminum)																
EPF (JHSV)																	
T-AG 5001 (OPDS)																	
Singapore Ships	Endurance class LPD/LST																
	RO/ROs																
	Fearless Class PV																
	Independence Class PV																

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

		US Aircraft											Sri Lankan Aircraft										
		Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	Mi-17	Mi-171	Mi-171E	Bell 206A	Bell 206B-3	Bell 212	Bell 412	Bell 412EP	Scout	Blue Horizon 2	
US Ships	LHD	Spots	8-10																				
		Hangar capacity	29 total																				
	LHA 6-7	Spots	9																				
		Hangar capacity	29 total																				
	LHA 8	Spots	9																				
		Hangar capacity	29 total																				
	LPD-17	Spots	2 or 4																				
		Hangar capacity	1 MV-22																				
	LSD 41-48	Spots	2																				
		Hangar capacity	No																				
	LSD-49-52	Spots	2																				
		Hangar capacity	No																				
	ESD (MLP)	Spots	1																				
		Hangar capacity	No																				
	AFSB (MLP)	Spots	2/4																				
		Hangar capacity	Yes																				
	T-AKE	Spots	1																				
		Hangar capacity	2 SH-60s																				
	T-AKR 304, (Bob Hope Class)	Spots	1																				
		Hangar capacity	No																				
T-AKR 311, 312, LMSR (Watson Class)	Spots	1																					
	Hangar capacity	No																					
T-AK 3008-3012 (Bobo class)	Spots	1																					
	Hangar capacity	No																					
T-AK 3017	Spots	1																					
	Hangar capacity	No																					
T-AVB	Spots	1																					
	Hangar capacity	No																					
LCC	Spots	1																					
	Hangar capacity	No																					
LCS 1 LM (steel)	Spots	1																					
	Hangar capacity	1																					
LCS 2 GD (aluminum)	Spots	1																					
	Hangar capacity	2																					
EPF (JHSV)	Spots	1																					
	Hangar capacity	No																					
T-AG 5001 (OPDS)	Spots	N/A																					
	Hangar capacity	N/A																					
SLN/NPB Ships	SLNS Sayura (flagship)	Sized to fit aircraft																					
		Spots	1																				
		Hangar capacity	1																				
	LSM (Yuhai Class)	Sized to fit aircraft	No																				
		Spots	0																				
		Hangar capacity	0																				
LCP (Fast Personnel Carriers)	Sized to fit aircraft	No																					
	Spots	0																					
	Hangar capacity	0																					

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

	Platform	US Surface Connectors												SLN/NPB Surface Connectors				
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	UCAC (M 10 Class)	In-shore patrol craft	Colombo Dockyards Kandula-class LCM (Ranagaja L 839, Ranavijaya L 836)	Yuqin-class LCM L 820 & L 821
US Ships	LHD	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Orange	Orange	Orange	Orange
	LHA 6-7	Yellow	Orange	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Orange	Yellow	Orange	Orange	Orange	Orange	Orange	Orange
	LHA 8	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LPD-17	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Orange	Orange	Orange	Orange
	LSD 41-48	Green	Green	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Orange	Orange	Orange	Orange
	LPD-49-52	Green	Green	Orange	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Orange	Orange	Orange	Orange
	ESD (MLP)	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Orange	Orange	Orange	Orange
	AFSB MLP	Orange	Green	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Orange	Orange	Orange	Orange
	T-AKE	Orange	Green	Green	Green	Yellow	Yellow	Yellow	Orange	Yellow	Orange	Green	Yellow	Orange	Orange	Orange	Orange	Orange
	T-AKR 304 LMSR (Bob Hope Class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Orange	Yellow	Green	Green	Yellow	Orange	Orange	Orange	Orange	Orange
	T-AKR 311,312 LMSR (Watson Class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Orange	Yellow	Green	Green	Yellow	Orange	Orange	Orange	Orange	Orange
	T-AK 3008-3012 (Bobo class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Orange	Yellow	Green	Green	Yellow	Green	Orange	Orange	Orange	Orange
	T-AK 3017 (Stockham)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Orange	Yellow	Green	Green	Yellow	Orange	Orange	Orange	Orange	Orange
	T-AVB	Orange	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LCC	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LCS 1 LM (steel)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
LCS 2 GD (aluminum)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	
EPF (JHSV)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Yellow	Green	Yellow	Orange	Orange	Orange	Orange	Orange	
T-AG 5001 (OPDS)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	
SLN/NPB Ships	SLNS Sayura (Sukanya-class patrol vessel, flagship)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Green	Orange	Orange	
	LSM/LST Shakthi (Yuhai Class)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	
	LCP (Fast Personnel Carriers)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

			US Aircraft										Taiwan Aircraft			
			Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	S-70C	S-70R	
US Ships	LHD	Spots	8-10													
		Hangar capacity	29 total													
	LHA 6-7	Spots	9													
		Hangar capacity	29 total													
	LHA 8	Spots	9													
		Hangar capacity	29 total													
	LPD-17	Spots	2 or 4													
		Hangar capacity	1 MV-22													
	LSD 41-48	Spots	2													
		Hangar capacity	No													
	LSD 49-52	Spots	2													
		Hangar capacity	No													
	ESD (MLP)	Spots	1													
		Hangar capacity	No													
	AFSB (MLP)	Spots	2/4													
		Hangar capacity	Yes													
	T-AKE	Spots	1													
		Hangar capacity	2 SH-60s													
	T-AKR 304 LMSR (Bob Hope Class)	Spots	1													
		Hangar capacity	No													
T-AKR 311,312 LMSR (Watson Class)	Spots	1														
	Hangar capacity	No														
T-AK 3008-3012 (Bobo class)	Spots	1														
	Hangar capacity	No														
T-AK 3017	Spots	1														
	Hangar capacity	No														
T-AVB	Spots	1														
	Hangar capacity	No														
LCC	Spots	1														
	Hangar capacity	No														
LCS 1 LM (steel)	Spots	1														
	Hangar capacity	1														
LCS 2 GD (aluminum)	Spots	1														
	Hangar capacity	2														
EPF (JHSV)	Spots	1														
	Hangar capacity	No														
T-AG 5001 (OPDS)	Spots	N/A														
	Hangar capacity	N/A														
Taiwan Amphibious and other Seabase Ships	LPD (planned)	Spots	TBD													
		Hangar capacity	TBD													
	LSTH Newport Class	Spots														
		Hangar capacity	0													
	LST 512-1152	Spots														
		Hangar capacity	0													
	LST 1-510	Spots														
		Hangar capacity	0													
	LSDH Anchorage Class	Spots														
		Hangar capacity	0													
	AOE-532 Fast Combat Support Ship	Spots	Yes													
		Hangar capacity	up to 2 medium													
	AOE-530	Spots	Yes													
		Hangar capacity	No													
RO/ROs	Spots															
	Hangar capacity	0														

Fully Interoperable
 Limited
 Not Operable
 No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom
- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors												Taiwan Surface Connectors									
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU1600	LCU2000	LCM 8	LARCV	INLS	RRDF	MPFUB	AAV	ABLTS	AAV-7	LCM 6	LCM 8	LCU	LVT-5	LVT-6	LCVP	LARC-V	
US Ships	LHD																						
	LHA 6-7																						
	LHA 8																						
	LPD-17																						
	LSD 41-48																						
	LSD-49-52																						
	ESD (MLP)																						
	AFSB MLP																						
	T-AKE																						
	T-AKR 304 LMSR (Bob Hope Class)																						
	T-AKR 311,312 LMSR (Watson Class)																						
	T-AK 3008-3012 (Bobo class)																						
	T-AK 3017 (Stockham)																						
	T-AVB																						
	LLC																						
	LCS 1 LM (steel)																						
	LCS 2 GD (aluminum)																						
EPF (JHSV)																							
T-AG 5001 (OPDS)																							
Taiwan Amphibious and other Seabase Ships	LPD (planned)																						
	LSTH Newport class																						
	LST 512-1152																						
	LST 1-510																						
	LSDH Anchorage class																						
	AOE-532 Fast Combat Support Ship																						
	AOE-530																						
RO/ROs																							

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR – RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

			US Aircraft										RTN Aircraft						
			Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	Bell 212	MH-60S	Bell 214 ST	S-76B	S-70B	Super Lynx 300
US Ships	LHD	Spots	8-10																
		Hangar capacity	29 total																
	LHA 6-7	Spots	9																
		Hangar capacity	29 total																
	LHA 8	Spots	9																
		Hangar capacity	29 total																
	LPD-17	Spots	2 or 4																
		Hangar capacity	1 MV-22																
	LSD 41-48	Spots	2																
		Hangar capacity	No																
	LSD-49-52	Spots	2																
		Hangar capacity	No																
	ESD (MLP)	Spots	1																
		Hangar capacity	No																
	AFSB (MLP)	Spots	2/4																
		Hangar capacity	Yes																
	T-AKE	Spots	1																
		Hangar capacity	2 SH-60s																
	T-AKR 304, Bob Hope Class	Spots	1																
		Hangar capacity	No																
T-AKR 311, 312, LMSR Watson Class	Spots	1																	
	Hangar capacity	No																	
T-AK 3008-3012 (Bobo class)	Spots	1																	
	Hangar capacity	No																	
T-AK 3017	Spots	1																	
	Hangar capacity	No																	
T-AVB	Spots	1																	
	Hangar capacity	No																	
LCC	Spots	1																	
	Hangar capacity	No																	
LCS 1 LM (steel)	Spots	1																	
	Hangar capacity	1																	
LCS 2 GD (aluminum)	Spots	1																	
	Hangar capacity	2																	
EPF (JHSV)	Spots	1																	
	Hangar capacity	No																	
T-AG 5001 (OPDS)	Spots	N/A																	
	Hangar capacity	N/A																	
Royal Thai Navy Amphibious and other Seabase Ships	Chakri Naruebet	Spots																	
		Hangar capacity	10																
	LPD Endurance Class	Spots																	
		Hangar capacity																	
	LSTH Normed Class	Spots	2																
		Hangar capacity																	
	AOL Matra (coastal)	Spots	1																
		Hangar capacity																	
	Similan Class AOR-H	Spots	1 Seahawk																
		Hangar capacity	2																
	RO/ROs	Spots																	
		Hangar capacity																	
	Offshore Patrol Vessel	Spots																	
		Hangar capacity																	
	Krabi Class	Spots	1 medium																
		Hangar capacity																	
	M46 Class	Spots	1 medium																
		Hangar capacity																	
	Pattani Class	Spots	1 medium																
		Hangar capacity																	

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors												Royal Thai Navy Surface Connectors														
Platform		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	UCAC (Griffon)	AAV 7	LCUs (modern from Singapore)	LCPV (modern)	LCM (ex-US delivered in the 1960's)	LCVP (old, 1960's)	LCA (1980s)	LCU (modern)	LCPL	LCUs, ordered	LCUs ordered			
US Ships	LHD																											
	LHA 6-7																											
	LHA 8																											
	LPD-17																											
	LSD 41-48																											
	LSD-49-52																											
	ESD (MLP)																											
	AFSB MLP																											
	T-AKE																											
	T-AKR 304 LMSR (Bob Hope Class)																											
	T-AKR 311,312 LMSR (Watson Class)																											
	T-AK 3008-3012 (Bobo class)																											
	T-AK 3017 (Stockham)																											
	T-AVB																											
	LLC																											
	LCS 1 LM (steel)																											
LCS 2 GD (aluminum)																												
EPF (JHSV)																												
T-AG 5001 (OPDS)																												
Royal Thai Navy Amphibious and other Seabase Ships	Chakri Naruebet CVH-911																											
	LPD Endurance Class																											
	LSTH Normed class																											
	AOL Matra (coastal tanker)																											
	Similan Class AOR-H																											
	RO/ROs																											
	Offshore Patrol Vessel																											
	Krabi Class																											
M46 Class																												
Pattani Class																												

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

			US Aircraft										
			Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B
US Ships	LHD	Spots	8-10										
		Hangar capacity	29 total										
	LHA 6-7	Spots	9										
		Hangar capacity	29 total										
	LHA 8	Spots	9										
		Hangar capacity	29 total										
	LPD-17	Spots	2 or 4										
		Hangar capacity	1 MV-22										
	LSD 41-48	Spots	2										
		Hangar capacity	No										
	LSD-49-52	Spots	2										
		Hangar capacity	No										
	ESD (MLP)	Spots	1										
		Hangar capacity	No										
	AFSB (MLP)	Spots	2/4										
		Hangar capacity	Yes										
	T-AKE	Spots	1										
		Hangar capacity	2 SH-60s										
	T-AKR 304 LMSR (Bob Hope Class)	Spots	1										
		Hangar capacity	No										
	T-AKR 311,312 LMSR (Watson Class)	Spots	1										
		Hangar capacity	No										
	T-AK 3008-3012 (Bobo class)	Spots	1										
Hangar capacity		No											
T-AK 3017	Spots	1											
	Hangar capacity	No											
T-AVB	Spots	1											
	Hangar capacity	No											
LCC	Spots	1											
	Hangar capacity	No											
LCS 1 LM (steel)	Spots	1											
	Hangar capacity	1											
LCS 2 GD (aluminum)	Spots	1											
	Hangar capacity	2											
EPF (JHSV)	Spots	1											
	Hangar capacity	No											
T-AG 5001 (OPDS)	Spots	N/A											
	Hangar capacity	N/A											
Timor Leste Ships	Jaco (Shanghai II) Class Fast Attack Craft	Spots											
		Hangar capacity											
Timor Leste Ships	Ex-Chamsuri Class	Spots											
		Hangar capacity											

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

	US Surface Connectors													Timor-Leste Surface Connectors		
	Platform	RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	LCU (forthcoming)	AAV 7 (forthcoming)
US Ships	LHD	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Green	Green
	LHA 6-7	Yellow	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Green	Green
	LHA 8	Orange	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Green	Green
	LPD-17	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Green	Green
	LSD 41-48	Green	Green	Green	Green	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Green	Green
	LSD-49-52	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Orange	Yellow	Green	Orange	Green	Green
	ESD (MLP)	Green	Yellow	Green	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Yellow	Orange	Orange	Yellow
	AFSB MLP	Orange	Yellow	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	T-AKE	Orange	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	T-AKR 304 LMSR (Bob Hope Class)	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Green	Green	Yellow	Orange	Yellow	Orange
	T-AKR 311,312 LMSR (Watson Class)	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Green	Green	Yellow	Orange	Yellow	Orange
	T-AK 3008-3012 (Bobo class)	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Green	Green	Yellow	Orange	Yellow	Orange
	T-AK 3017 (Stockham)	Green	Green	Orange	Orange	Green	Green	Green	Green	Green	Green	Green	Yellow	Orange	Yellow	Orange
	T-AVB	Orange	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LLC	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LCS 1 LM (steel)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	LCS 2 GD (aluminum)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
EPF (JHSV)	Green	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Yellow	Yellow	Orange	Yellow	Orange	
T-AG 5001 (OPDS)	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	
Timor-Leste Ships	Jaco (Shanghai II) Class Fast Attack Craft	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
	Ex-Chamsuri Class	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

		US Aircraft											
		Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	
US Ships	LHD	Spots	8-10										
		Hangar capacity	29 total										
	LHA 6-7	Spots	9										
		Hangar capacity	29 total										
	LHA 8	Spots	9										
		Hangar capacity	29 total										
	LPD-17	Spots	2 or 4										
		Hangar capacity	1 MV-22										
	LSD 41-48	Spots	2										
		Hangar capacity	No										
	LSD-49-52	Spots	2										
		Hangar capacity	No										
	ESD (MLP)	Spots	1										
		Hangar capacity	No										
	AFSB (MLP)	Spots	2/4										
		Hangar capacity	Yes										
	T-AKE	Spots	1										
		Hangar capacity	2 SH-60s										
	T-AKR 304 LMSR (Bob Hope Class)	Spots	1										
		Hangar capacity	No										
T-AKR 311,312 LMSR (Watson Class)	Spots	1											
	Hangar capacity	No											
T-AK 3008-3012 (Bobo class)	Spots	1											
	Hangar capacity	No											
T-AK 3017 (Stockham)	Spots	1											
	Hangar capacity	No											
T-AVB	Spots	1											
	Hangar capacity	No											
LCC	Spots	1											
	Hangar capacity	No											
LCS 1 LM (steel)	Spots	1											
	Hangar capacity	1											
LCS 2 GC (aluminum)	Spots	1											
	Hangar capacity	2											
EPF (JHSV)	Spots	1											
	Hangar capacity	No											
T-AG 5001 (OPDS)	Spots	N/A											
	Hangar capacity	N/A											
Tongan Ships	Patrol Boat (Pacific Class)	Spots	0										
		Hangar capacity	N/A										

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors													Tongan Surface Connectors
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	LCM 8
US Ships	LHD	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Green	Orange	Yellow	Green	Orange	Grey
	LHA 6-7	Yellow	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Orange	Yellow	Orange	Orange	Yellow
	LHA 8	Grey	Green	Green	Green	Green	Yellow	Green	Green	Green	Orange	Yellow	Green	Orange	Grey
	LPD-17	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Green	Orange	Yellow	Green	Orange	Grey
	LSD 41-48	Green	Green	Green	Green	Green	Yellow	Green	Green	Green	Orange	Yellow	Green	Orange	Grey
	LSD 49-52	Green	Green	Orange	Green	Green	Yellow	Green	Green	Green	Orange	Yellow	Green	Orange	Grey
	ESD (MLP)	Green	Yellow	Green	Green	Grey	Grey	Grey	Grey	Grey	Orange	Grey	Yellow	Orange	Grey
	AFSB MLP	Orange	Yellow	Orange	Orange	Grey	Grey	Grey	Grey	Grey	Orange	Grey	Orange	Orange	Grey
	T-AKE	Orange	Green	Orange	Orange	Yellow	Yellow	Yellow	Orange	Yellow	Orange	Grey	Orange	Grey	Grey
	T-AKR 304 LMSR (Bob Hope Class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange	Grey
	T-AKR 311,312 LMSR (Watson Class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange	Grey
	T-AK 3008-3012 (Bobo class)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Green	Grey
	T-AK 3017 (Stockham)	Green	Green	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Orange	Grey
	T-AVB	Orange	Green	Orange	Orange	Grey	Grey	Grey	Orange	Grey	Orange	Grey	Orange	Orange	Grey
	LCC	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Grey
	LCS 1 LM (steel)	Grey	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Grey
LCS 2 GD (aluminum)	Grey	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Grey	
EPF (JHSV)	Green	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Yellow	Orange	Yellow	Orange	Grey	
T-AG 5001 (OPDS)	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	
Tongan Ships	Patrol Boat (Pacific Class)	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

			US Aircraft									Royal Navy aircraft						
			Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	AW 101 Mk 3 Logistics Transport	AW 101 Mk 3A Logistics Transport	AW 101HC Mk 3 Logistics Transport	Sea King Mk 4 Logistics Utility	Sea King Mk 5U Logistics Utility
LHD	Spots	8-10																
	Hangar capacity	29 total																
LHA 6-7	Spots	9																
	Hangar capacity	29 total																
LHA 8	Spots	9																
	Hangar capacity	29 total																
LPD-17	Spots	2 or 4																
	Hangar capacity	1 MV-22																
LSD 41-48	Spots	2																
	Hangar capacity	No																
LSD-49-52	Spots	2																
	Hangar capacity	No																
ESD (MLP)	Spots	1																
	Hangar capacity	No																
AFSB (MLP)	Spots	2/4																
	Hangar capacity	Yes																
T-AKE	Spots	1																
	Hangar capacity	2 SH-60s																
T-AKR 304 LMSR (Bob Hope Class)	Spots	1																
	Hangar capacity	No																
T-AKR 311,312 LMSR (Watson Class)	Spots	1																
	Hangar capacity	No																
T-AK 3008-3012 (Bobo class)	Spots	1																
	Hangar capacity	No																
T-AK 3017 (Stockham)	Spots	1																
	Hangar capacity	No																
T-AVB	Spots	1																
	Hangar capacity	No																
LCC	Spots	1																
	Hangar capacity	No																
LCS 1 LN (steel)	Spots	1																
	Hangar capacity	1																
LCS 2 GD (aluminum)	Spots	1																
	Hangar capacity	2																
EPF (HHSV)	Spots	1																
	Hangar capacity	No																
T-AG 5001 (OPDS)	Spots	N/A																
	Hangar capacity	N/A																
Royal Navy Ships	Ocean (helicopter carrier)	Spots	6/6															
		Hangar capacity	12															
	Albion (Amphibious assault ship)	Spots	2/3															
		Hangar capacity	N/A															
	Rover Small fleet tanker	Spots	2															
		Hangar capacity	No															
	Fort Victoria	Spots	2															
		Hangar capacity	3															
	Fort Rosalie	Spots	4															
		Hangar capacity	yes															
	Stena Type forward repair ship	Spots	1															
		Hangar capacity																
	Argus Casualty receiving ship also aviation training	Spots	Yes															
		Hangar capacity	Yes															
	Bay Landing ships dock auxiliary	Spots	2															
		Hangar capacity	NO															
	Wave large fleet tanker	Spots	1															
		Hangar capacity	Yes															
	Point RORO vessel	Spots	4															
		Hangar capacity																

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors												Royal Navy Surface Connectors				
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	Griffin 2400 TD(M) Hovercraft	LCVP Mk 5 landing craft vehicle and personnel	LCU Mk 10 landing craft utility	
US Ships	LHD																	
	LHA 6-7																	
	LHA 8																	
	LPD-17																	
	LSD 41-48																	
	LSD-49-52																	
	ESD (MLP)																	
	AFSB MLP																	
	T-AKE																	
	T-AKR 304 LMSR (Bob Hope Class)																	
	T-AKR 311,312 LMSR (Watson Class)																	
	T-AK 3008-3012 (Bobo class)																	
	T-AK 3017 (Stockham)																	
	T-AVB																	
	LCC																	
	LCS 1 LM (steel)																	
	LCS 2 GD (aluminum)																	
	EPF (JHSV)																	
T-AG 5001 (OPDS)																		
Royal Navy Ships	Ocean (helicopter carrier)																	
	Albion (Amphibious assault ship)																	
	Rover Small fleet tanker																	
	Fort Victoria																	
	Fort Rosalie																	
	Stena Type forward repair ship																	
	Argus Casualty receiving ship also aviation training																	
	Bay Landing ships dock auxiliary																	
	Wave large fleet tanker																	
	Point RORO vessel																	

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock

- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix F. Interoperability Matrix

Interoperability between aircraft and ships

			US Aircraft										Vietnam aircraft						
			Spot/Spot-Factor	MH-60	AH-1W	AH-1Z	UH-1N	UH-1Y	CH-53E	CH-53K	MV-22B	RQ-21	F-35B	KA-32 Helix	SA 365 Dauphin	EC 225	MI-17,19,171,172	MD 500 military	Bell 205 UH-1
US Ships	LHD	Spots	8-10																
		Hangar capacity	29 total																
	LHA 6-7	Spots	9																
		Hangar capacity	29 total																
	LHA 8	Spots	9																
		Hangar capacity	29 total																
	LPD-17	Spots	2 or 4																
		Hangar capacity	1 MV-22																
	LSD 41-48	Spots	2																
		Hangar capacity	No																
	LSD-49	Spots	2																
		Hangar capacity	No																
	ESD (MLP)	Spots	1																
		Hangar capacity	No																
	ASFB (MLP)	Spots	2/4																
		Hangar capacity	Yes																
	T-AKE	Spots	1																
		Hangar capacity	2 SH-60s																
	T-AKR 304, (Bob Hope Class)	Spots	1																
		Hangar capacity	No																
T-AKR 311, 312, LMSR (Watson Class)	Spots	1																	
	Hangar capacity	No																	
T-AK 3008-3012 (Bobo class)	Spots	1																	
	Hangar capacity	No																	
T-AKE-3017	Spots	1																	
	Hangar capacity	No																	
T-AVB	Spots	1																	
	Hangar capacity	No																	
LCC	Spots	1																	
	Hangar capacity	No																	
LCS 1 LM (steel)	Spots	1																	
	Hangar capacity	1																	
LCS 2 GD (aluminum)	Spots	1																	
	Hangar capacity	2																	
EPF (JHSV)	Spots	1																	
	Hangar capacity	No																	
T-AG 5001 (OPDS)	Spots	N/A																	
	Hangar capacity	N/A																	
Vietnam ships	LST-511/512	Spots																	
		Hangar capacity																	
	Polnocny LSM	Spots	N/A																
		Hangar capacity	N/A																
	Nau Dinh LSM HQ-521	Spots																	
		Hangar capacity																	
	Damen 9014 Class KN-781 Patrol vessel	Spots	1 medium																
		Hangar capacity	Yes																
	KN-782 Surveillance Vessel	Spots	1																
		Hangar capacity	No																
	RO/ROs	Spots																	
		Hangar capacity																	
	TT400TP	Spots																	
		Hangar capacity																	

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- MH-60 – Seahawk
- AH-1W – Super Cobra
- AH-1Z – Viper
- UH-1N – Iroquois
- UH-1Y – Venom

- CH-53E – Super Stallion
- CH-53K – King Stallion
- MV-22B – Osprey
- RQ-21 – Blackjack
- F-35B – Lightning II

Appendix F. Interoperability Matrix

Interoperability between ships and surface connectors

		US Surface Connectors												Vietnam Surface connectors						
		RO/RO	LO/LO	FLO/FLO	LCAC/SSC	LCU 1600	LCU 2000	LCM 8	LARC V	INLS	RRDF	MPF UB	AAV	ABLTS	LCM	LCU	STX Finald Oy Hovercraft	LARC-5	LCVP	RHIB
US Ships	LHD																			
	LHA 6-7																			
	LHA 8																			
	LPD-17																			
	LSd 41-48																			
	LSD-49-52																			
	ESD (MLP)																			
	AFSB MLP																			
	T-AKE																			
	T-AKR 304 LMSR (Bob Hope Class)																			
	T-AKR 311,312 LMSR (Watson Class)																			
	T-AK 3008-3012 (Bobo class)																			
	T-AK 3017 (Stockham)																			
	T-AVB																			
	LCC																			
	LCS 1 LM (steel)																			
	LCS 2 GD (aluminum)																			
EPF (JHSV)																				
T-AG 5001 (OPDS)																				
Vietnam Amphibious and other Seabase Ships	LST-511/512																			
	Polnocny LSM																			
	Nau Dinh LSM HQ-521																			
	Damen 9014 Class (DN-2000) Patrol vessel, KN-781																			
	KN-782 Surveillance Vessel																			
	RO/ROs																			
TT400TP																				

	Fully Interoperable
	Limited
	Not Operable
	No Supporting Data

- RO/RO – Roll On/Roll Off
- LO/LO – Lift On/Lift Off
- FLO/FLO – Float On/Float Off
- LCAC – Landing Craft Air Cushion
- LCU – Landing Craft Utility
- LCM – Landing Craft Mechanized
- LARC V – Lighter, Amphibious Resupply, Cargo, 5 ton
- INLS – Improved Navy Lighterage System
- RRDF - Roll On/Roll Off Discharge Facility
- MPF UB – Maritime Prepositioning Force Utility Boat
- AAV – Amphibious Assault Vehicle
- ABLTS – Amphibious Bulk Liquid Transfer System
- LHD – Landing Helicopter Dock
- LHA – Landing Helicopter Assault
- LPD – Landing Platform Dock
- LSD – Landing Ship Dock
- ESD – Expeditionary Transfer Dock
- AFSB – Afloat Forward Staging Base
- T-AKE – Auxiliary Cargo and Ammunition Ship
- T-AKR - RO/RO Vehicle Cargo Ship
- T-AK – Dry Cargo Ship
- T-AVB – Container RO/RO and LO/LO Cargo Ship
- LCC – Amphibious Command Ship
- LCS – Littoral Combat Ship
- EPF – Expeditionary Fast Transport
- T-AG OPDS – Offshore Petroleum Distribution System

Appendix G. PHIBRON Predeployment Checklist

TASK ID NUMBER	POC	ITEM	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
	POC	D >275 ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
1	CDRE / DEP	Receipt of DEPOD.					
2	N3	Request and review past lessons learned.					
3	N43	Request past site survey information from (NBG / BMU) if available.					
4	N2 / CRC	Augmentation Request Message to C3F for CCOP / Cryptologic DIRSUP Support.	GAP - C10F				
5	N2	D-270 Pre-Deployment Intelligence Message to C3F.					
6	N2	Identify intel, photo, and crypto training classes needed.					
7	N1	Verify all crewmembers have valid passports. Liaison with prospective gains to verify passport status if member intends to meet Command in foreign country.					
8	N1	Identify and address special requirements (e.g. passports, international drivers licenses, additional manning, customs, etc).					
9	N1	Review EDVR for manning and NEC shortfalls.					
10	N1	Conduct complete check on accuracy of EDVR and ODCR. Make appropriate diary corrections to rectify errors noted.					
11	N3 / N4 / N6 / N7	FRTP in-brief.	3501 Inst Int Training				
12	N3 / N5	Group Sail.	OPORD				
13	N3 / N5	PMINT.	OPORD				
		TFCC PRODUCTS D-225					
		ITEMS DUE TO CDRE NLT D-225					
		ITEMS DUE TO DEP NLT D-225					
14	N3	CDRE briefing points: Collate CCIR/OPTASK/Standing orders.					
	Senior Watch Officer	Watch Binders.					
15	N3 / N6	Watch Products/Templates.					
	Senior Watch Officer	Training Products ISO JQR.					
17	N3	OPGEN SUPP.					
		ACT I PRODUCTS D-215					
		ITEMS DUE TO CDRE NLT D-215					
		ITEMS DUE TO DEP NLT D-215					
19	N3	CDRE updated briefing points.					
20	N2 / N3 / N6 / Unit	OPTASKS & PPT Brief for each OPTASK.					
21		Review ROE.					
22	N3 / S3	ARG/MEU Capabilities brief.					
	POC	D >190 ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
23	N2	D-210: Intelligence Team Trainer 1 located at FITPAC.					
24	N2	D-210: R2P2 Primer.					
25	N8	NSEA submitted to CLF for concurrence.					
	POC	D >180 ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
26	N4	Order and issue desert Camo uniforms to Pre-Party participants.					
27	DEP / N1	Prepare working roster of personnel and prepare requests (resolve individual problems).					
28	DEP / N3 / NBG	Identify pre party, identify site survey team and prepare appropriate TAD requests.					
29	Site Survey Team	Conduct site survey and prepare report.					
30	N3	Order OPAREA charts, GPS cards, GDFS Maps and NAVNET chips.					
31	N6	Develop rough communications plan. Request current FREQ plan from current deployed Squadron 180 days out.					
32	Department Heads	Identify all TOA and essential parts and material. Order required parts.					
33	Department Heads	Identify special equipment requirements and place appropriate requests via Naval Message.					
34	Senior Watch Officer / Department Heads	Prepare initial watchbill and determine training requirements to support watchstanding. Validate WQSB.					
35	N2	Review individual security clearances and update as necessary for entire squadron.					
36	N2	Obtain / Review initial security clearance alpha rosters from subordinate commands.					
37	N1	Review EDVR for manning and NEC shortfalls.					
38	N1	Request special manning assistance from CNSP if necessary to resolve any critical readiness issues.					
	POC	D-180 ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
39	N7 / Department Heads	Review training records, expedite training personnel who have not completed required PQS. Conduct refresher training for qualified personnel. Review PG/PL of required NECs.					
40	N6	Verify all units have applicable communications equipment via CEPS (SHF / UHF/ Air circuits/ HF/ Marine gear/ LAN components and spares).					
41	EKMS Manager & N6	Notify of material draw requirements IRT EKMS / CMS. Verify all EKMS managers are in compliance with inspections and have asked for all deployment crypto.					
42	N2	D-180 Pre-Deployment Intelligence Message to C3F					
43	N2	ACT1					
44	N2	R2P2					
45	N3	Verify that complete Permanent Allowance of maps, charts and related publications are onboard.					
46	N3	Verify that COs directive specifying charts and pubs to be corrected (Article 323 of OPNAVINST 3120.32 (Series)) properly reflects the intended deployment areas.					
47	N3	Conduct liaison visit with local DMA office NAS, North Island for latest Mapping, Charting, and MCOG brief.					
48	N3	Procure extra copies of port and harbor charts as required.					
49	N3	Ensure all required Port Directories are on board.					
50	Senior Enlisted Leader / CCC	Review command retention team members and identify reliefs for those members who will be prospective losses to the command prior to or during deployment.					
51	N4	Verify boat flag and pennant staffs are in compliance with U.S. Navy regulations.					
52	CDRE/DEP	Verify personnel designated in writing as FPO with delineated responsibilities.					
53	N5	Verify unit has copy of OPNAVINST 3591, OPNAVINST 5530.13, OPNAVINST 5530.14, OP-5.					
54	N5	Verify FPO attended FPO COI (J-830-0015).					
55	N5	Verify Weapons Officer attended Anti-Terrorism Officer COI.					
56	N5	Verify CO attended FP/AT Level III training.					
57	FPO	Verify crewmembers have been given FP/AT Level I and II Training (FPO).					
58	FPO	Schedule use of Deadly Force brief.					
59	N3	Review Blue Dart message procedures.					
60	FPO	Verify Physical Security / Force Protection instruction addresses: Fires, Explosions, Civil Disturbances, Sabotage, Bomb threat, Terrorist Acts, Anti-sneak/anti-swimmer attack.					

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61	N4	Make sure portable electrical hand tools are in good repair and adequate to support maintenance needs.					
62	N4	Complete inventory of NSTM CD-ROM and technical pubs CD-ROM.					
63	Department Heads	Review WQSB and make changes as necessary and submit to SWO. Verify assignments at D-30.					
64	Medical	Schedule appropriate medical training.					
65	Medical	Review dental readiness. Schedule dental appointments as necessary.					
66	DEP	Identify requirements for personnel augmentation to (NBG / BMU). (Personnel shortfalls)					
67	DEP / Department Heads / N4	Prepare comprehensive loadout plans. (Advance Party / Main Body)					
68	N6	Determine termination point for guard and I.P. shift.					
69	N3	Verify necessary pubs on board or ordered.					
70	Department Heads	Verify test equipment on hand and calibrated, necessary to support deployment.					
71	Medical	Screen medical/dental/shot records and bring delinquencies up to date. (Ensure necessary immunizations are identified and provided especially for OCONUS).					
72	N8	Arrange time to review loadout plan and perform initial inspection.					
73	N4	Review OPTAR funding to support deployment.					
74	N2	Obtain / Review security clearance alpha rosters from subordinate commands. (Noting progress and deficiencies)					
75	CRC	Ensure all embarked commands provide security clearance information to facilitate SAAR completion.					
76	N2	Identify intel photo, and crypto training classes needed.					
77	N6	Have all units indicate Knowledge Manager and CAS Administrators to Staff KM.					
78	N2	Order maps and charts as necessary.					
79	N2	Identify intel equipment requirements.					
80	N2	Complete EWIC (NEC 3912) training for IO.					
81	N2	Complete EWIC (NEC 3912) training for IS's.					
82	N2	IO schedule intel briefs on political / military situation, and Threat Assessment / Counter Terrorist activity in AOR.					
83	N2	IO contact deployed intel chain of command to set aside a turnover INTEL kit.					
	POC	D-150 ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
84	CRC	Obtain / Review security clearance alpha rosters from subordinate commands. (Noting progress and deficiencies)					
85	N2	ACT2					
86	N4	Verify adequate supply of safety boots, safety helmets, with chinstraps and work gloves.					
87	PAO	Ensure enough pictures of the CO are available for public relations.					
88	PAO	Order enough welcome aboard packages for deployment.					
89	FPO / N2	Identify threat for countries in AO.					
90	N2	IO update briefings on military / terrorist threat in conjunction with FPO.					
91	N2	PMINT Vignette support.					
92	FPO	Schedule Anti-Terrorism / Force Protection Level I Brief. Page 13 entry is required.					
93	CRC	Draft EA notification message(s) for PMINT.	SCORE SIPR website, C3F OPORD				
	POC	D-120 ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
94	CRC	Obtain / Review security clearance alpha rosters from subordinate commands. (Noting progress and deficiencies)					
95	N2	Intelligence Team Trainer 2 located at FITCPAC					
96	N7	Verify critical schools and CIN requirements					
97	N3	Submit request for personnel augment for deployment if needed.					
98	N3 / N4	Stock adequate supplies of cover sheets, weather observation forms, bearing books, navigator's workbook, magnetic compass log, plotting sheet, plastic overlay, flashlights, batteries, bulbs, dividers, triangles, parallel rules, lens paper, pencils, masking tape, and erasers.					
99	N1	Conduct complete check on accuracy of EDVR and ODCR. Make appropriate diary corrections to rectify errors noted.					
100	DAPA	Ensure current DAPA has attended course within 90 days of assignment.					
101	DAPA	Ensure adequate alcohol and other drug abuse education material is on hand.					
102	N6	Have EHF / UHF / SHF SAR for deployment submitted (EHF SAR / GAR and UHF submitted to NCTAMSPAC and SHF submitted via CARS).					
103	Senior Enlisted Leader	Schedule a pre-deployment brief for the families and crew.					
104	CRC	Draft EA notification message(s) for C2X.	SCORE SIPR website C3F OPORD 201				
105	CRC	Draft EA notification message(s) for CERTEX.	SCORE SIPR website, C3F OPORD				
	POC	D-90 ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
106	N3	Initial Battle Rhythm five days before PMINT.					
107	N8	NSEA finalized					
108	Medical	Command wide HIV testing.					
109	CDRE / DEP / Ship CO / N3	Brief to SURFPAC.					
110	N2	Arrange and schedule Counter Intelligence Brief for Command (required annually).					
111	N2	Arrange and schedule Intelligence Oversight Brief for Command (required annually).					
112	N2	Arrange and schedule NATO Briefing for ability to receive SIPR Accounts who have Secret Clearances or higher.					
113	N2	Ensure SF-312's are signed, on file, and logged in JPAS for all who have clearances.					
114	N2	Ensure Attestations are filed out and logged in JPAS for those who have TS and TS/SCI Clearances.					
115	N2	Arrange and schedule OPSEC Brief for Command (Required every year).					
116	N2	Obtain / Review security clearance alpha rosters from subordinate commands. (Noting progress and deficiencies)					
117	N2	Intelligence Team Trainer 3 located at FITPAC					
118	N2	D-90 Pre-Deployment Intelligence Message due to C3F.					
119	N3	Inventory NWPL publications and ensure additional NWPLs required by OPORDERs are on board.					
120	N7	Submit Deployment Training Plan for approval to CO.					

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121	N6	Ensure all communication gear is in working order and all applicable communication publications and COMM Plans have been or are in works. Communicate with					
122	N6	Conduct on the air checks to verify operability. Verify all air circuits have been identified.					
123	N6	Draw CMS material. Ensure full allowance is on hand.					
124	N1	Verify all crewmembers have valid passports. Liaison with prospective gains to verify passport status if member intends to meet Command in foreign country.					
125	N1	Ensure adequate supplies of admin supplies are available onboard, IE. Letterhead, ESWS/EAWS pins and blank certificates, NAMs, COMs, and award blanks.					
126	N3	CDRE/DEP/N3 review deployment schedule.					
127	N5	Review responsibilities for METOC reporting and heavy weather bill.					
128	N4	Submit Official Representation Funds (ORF).					
129	N1	Verify all crewmembers have government credit card.					
130	Medical	Complete Medical Readiness Assessment evaluated by ISIC.					
131	PAO	Verify and update the hold file at Fleet Hometown News Center.					
132	PAO	Update and read PA directives concerning deployment.					
133	N1 / Legal	Federal/state/local tax return should be filed or extensions of time to file taxes sent.					
134	MWR	Conduct Welfare and Recreation Committee and Council meetings to discuss crew desires for application of funds.					
135	MWR	Order a supply of country guides, language guides and phrase guides.					
136	VOTING ASST Officer	Command voting officer ensure adequate supplies of state and federal tax forms are available if ship intends to be deployed prior to APR 15.					
	POC	D-60 ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
	Senior Watch Officer	POM List.					
137							
138	N2	Obtain / Review security clearance alpha rosters from subordinate commands.					
139	N6	Develop ADP Plan, computer, software, peripheral requirements.					
140	N6	Submit bandwidth allocation matrix to ships.					
141	CRC	Submit RIVERCITY matrix to ships.					
142	Department Heads	Identify consumables and place orders (MREs, line, tape, logs, etc).					
143	Medical	Verify physical readiness for Command Personnel. Verify all inoculations current with AOR.					
144	N4 / N8	Finalize loadout plan, ensure necessary dunnage for loadout onto ship. Identify Hazmat Plan. (TCAIMS)					
145	N3	Complete Notice to Mariners chart corrections.					
146	N3	Final review of LOI and briefing to all hands including any special items (e.g. hot or cold weather ops, etc).					
147	Senior Watch Officer	Finalize WQSB, Watchbill and distribute.					
148	CDRE / DEP / FPO	Review/update Force Protection Plan and CO's standing orders.					
149	N1	Make arrangements for mail and other necessary service at unit compound while absent. (Obtain FPO Address)					
150	CRC	Prepare final Clearance list for unit. Verify anticipated visitors have security clearances on file with unit.					
151	N6	Verify all SAAR forms are completed for all embarked command personnel.					
152	N5	Submit Country Clearance List.					
153	N6	Finalize list of authorized message releasers and process for submitting message traffic to Staff.					
154	CRC	Update Emergency Action Plan and Emergency Destruction Bill.					
155	CRC	Verify ships have Emergency Action Plan and Emergency Destruction Bill.					
156	N4	Determine flight meal requirements and make arrangements for same, if required.					
157	N3	Verify berthing / barracks space is open for returning deployers.					
158	N3	Ensure an adequate shredder for local destruction of classified material is on board.					
159	CRC	Ensure a detailed Emergency Action Plan is posted and personnel are trained in its use.					
160	N3	Prepare formatted message drafts for: OPREP-3s and fast reaction communication responses. Train personnel on reporting procedures.					
161	N3	Prepare a file of pertinent instructions and notices including extracts from Communications Annexes of current OPLANS and OPORDERS. This should include NAVCAMS/PAC Fleet Telecommunication Procedures instructions C2300.2 and up-to-date PAC CIBS.					
162	N7	Ensure all applicable NTTP's are on hand.					
163	N6	Ensure full allowance of radiotelephone handsets and headsets are on board.					
164	N6	Verify all communication gears is in working order and have spares available this should be completed during group sail.					
165	N6	Check operation of all crypto equipment and ensure associated spare parts kits have been checked and/or overhauled if necessary.					
166	N6	Conduct an operational test of UHF/HF relay equipment in both voice and FSK/tone modes.					
167	N6	Conduct operational check of all single and multi-channel voice radio receivers and transmitters. Completely check out in all modes of operation to ensure full system					
168	N6	Inspect, clean, and adjust all antenna patch panels, patch cord connectors, and associated terminal equipment.					
169	N6	Review all AIG/CIDs to determine which will not be required to conduct mission while on deployment.					
170	N6	Verify all commands have AIG/CADS needed for deployment on their guard list for the specific numbered fleet.					
171	N3	Obtain current OPTASKs for AOR deployment.					
172	Senior Watch Officer	Review WQSB for correctness and provisions for conditions of readiness and emergency stations.					
173	Senior Watch Officer	POM personnel matrix to CDRE via DEP for approval.					
174	N1	Ensure that all hands with dependents have applied for and actually received military dependents ID cards and will not expire while on deployment.					
175	N1	Ensure all hands have valid ID cards and that they will not expire while on deployment.					
176	N1	Ensure that all hands have executed an up-to-date record of emergency data.					
177	N1	Review orders of personnel reporting for duty with the intent of initiating action to insure reporting prior to departure. Where reporting date will occur after deployment date advise detaching activity of proper routing instructions for each individual listed as a prospective gain. Also review orders for personnel detaching within 30 days after sailing, and request ORDMODS to detach personnel prior to deployment if not critical to readiness.					
178	N4	Review and expedite all outstanding requisitions and continue to monitor status of load out.					
179	N4	MST takes possession of Detachment Deployment Pack-up Kit (DDP), conducts inventory, and verifies all material is "on hand/on order".					
180	N4	Identify any Special Weather Clothing requirements and submit.					

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181	N4	Verify CBR gear requirements are on hand.					
182	N4	Ensure all pertinent forms and publications listed in NAVSUP P-485, para. 6040 and 6041 are carried and up to date. Carry only those forms and publications applicable to your					
183	N4	Schedule a meeting between Comptroller, CO, Operations Officer, Supply Officer, and OICs to review procedures for payment of port services, fuel, Official Representation Funds (ORF) and Official TAD during deployment.					
184	Medical	Schedule training for crew on Sexually Transmitted diseases and Health and Safety in Foreign Ports.					
185	UPC	Ensure an adequate quantity of urine sample containers and associated materials are on board.					
186	N2	Complete intelligence systems familiarization.					
187	N2	Complete responsibilities and reporting training for IO.					
188	N2	Receive updated briefings on military/terrorist threat.					
189	N2	Download Intel Pubs, Order Of Battles (OOB) for AOR and NCIS Port Threat Briefs onto					
190	N2	Receive training on digital camera use, transmission and receipt training and final equipment checkout (SNOOPY Training).					
191	N1 / Legal	Notify NCIS of pending deployment.					
192	N1 / Legal	Notify local Trail Service Office of deployment if an ongoing court case exists.					
193	N1 / Legal	Review the directives of appropriate area commanders relating to the exercise of criminal jurisdiction by foreign countries.					
194	N1 / Legal	Have the following pubs available: JAGINST 5800.7 (Series), Manual for Courts-Martial, NATO Status of Forces Agreements, OPNAVINST 5350.4 (Series) Substance Abuse Prevention and Control, SECNAV INST 5710.22 Procedures for handling requests for Political Asylum and Temporary Refuge, MILPERSMAN, CJCINST 3121.01 (Series).					
195	N1 / Legal	Ensure appointment of Foreign Claims Officer.					
196	N1 / Legal	Ensure the Legal Officer is familiar with Admiralty Claim procedures outline in JAGMAN, Chapter XII.					
197	N1 / Legal	Ensure there is an understanding of injury reporting requirements as detailed in OPNAVINST 5102.1 (Series) and JAGMAN, Chapter VIII.					
198	N1 / Legal	Schedule a legal assistance visit for wills, power of attorney, etc.					
199	N1 / Legal	Schedule ROE, Humanitarian Rights, and Law of Armed Conflict briefs.					
	POC	D-45 ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
200	N4	Request OPTAR augment if required.					
201	N4	Inventory Pack Up Kit (PUK). Place any missing items on order.					
202	CDRE / DEP / Ship CO / N3	Brief to SURFPAC.					
203	Department Heads	Submit POAM way ahead during POM to Deputy.					
	POC	D-30 ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
204	All	Shift into deployment uniform and conduct uniform inspection.					
205	Department Heads	Submit appropriate messages to gaining fleet.					
206	N4	Contact Supply Officer that have recently returned from deployment for information about material in short supply, bill paying, and phone numbers of contracts from overseas support activities.					
207	N2	Obtain / Review security clearance alpha rosters from subordinate commands. (Noting progress and deficiencies)					
208	N3	Obtain an adequate supply of paper and message reproduction consumables.					
209	Department Heads	Identify critical parts not yet received.					
210	N6	Draw CMS material. Ensure full allowance is on hand.					
211	N3	Receive LOI for deployment.					
212	N3	Send communications equipment inventory report.					
213	N3	Ensure a complete file of all CIBs and general message files are up-to-date as appropriate.					
214	N3	Review Command bills and procedures.					
215	Senior Enlisted Leader	Ensure the Ombudsmen has been briefed and knows all POCs and phone numbers. Ensure crew's families know who and how to get in touch with the Ombudsmen.					
216	N3	Follow up on overdue supply and chart requisitions.					
217	N3	Notify DMA and ISIC of any map and chart shortages. Verify oceanography and meteorology-related publications and references are on board.					
218	N1	Request special manning assistance from ISIC if necessary to resolve any critical readiness issues.					
219	N1	Prepare list of personnel aboard who may be able to act as interpreter in any foreign language of dialects.					
220	N1	Instruct personnel concerning current instructions and procurement and use of absentee					
221	N4	Receive pre-deployment brief on OPTAR management, port service processing, IMPAC card procedures, Emergency Travel procedures, and contingency spending plans.					
222	N4	Identify all outstanding requisitions and report.					
223	N3	Develop a lesson learned tickler file for frequent update and review during deployment.					
224	Senior Watch Officer	Verify Watch, Quarter & Station Bill assignments.					
225	MWR	Purchase athletic equipment.					
226	MWR	Establish policy for onboard storage of personal athletic equipment.					
227	MWR	Purchase supplies and decoration materials for seasonal observances.					
228	MWR	Buy an additional supply of gaming gear.					
229	PAO	Update family gram mailing list and send family gram giving family information needed during deployment.					
230	N6	Request Numbered Fleet frequencies for Marines and Emabarked Commands. Verify ships have LAN settings for shifting into Numbered Fleet.					
231	N6	Send out OPTASK COMMS to all units as well as EHF service plan.					
232	N6	Send out EHF service plan.					
233	N2	Verify JPAS Visit Request / Access roster sent from individual unit Security Managers.					
234	N2	IO signs for remainder of intelligence load-out to include additions to IMM, OPTASK, and Theater specific pubs, equipment, maps, or supplies.					
235	N1 / Legal	Ensure completion of all courts-martial records, JAGMAN investigations and NJP appeals before departure.					
236	N1 / Legal	Expedite all pending NCIS or shipboard command investigations. Notify JAG of ongoing criminal investigations, which will not be completed at least 30 days before deployment.					
237	N1 / Legal	Ensure all admin discharge proceedings are started.					
238	Legal	100% contact with CPR-5 staff for Wills and POA					

Appendix G. PHIBRON Predeployment Checklist

	POC	D<15 ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
239	N1	Have all reproducing machines checked and repaired if needed by appropriate repair					
240	N8	Initiate personnel routing instructions to designated passenger control points.					
241	N1	Prepare orders and service, pay, health records etc of personnel to be transferred to PSD or separation activity upon sailing.					
242	PAO	Mail updated Fleet Home Town News Command (FHTNC) hold file and beginning of deployment story to FHTNC.					
243	PAO	Upon departure send message to FHTNC containing names/rates of crewmen on hold file who missed sailing to prevent their inclusion in deployment roster story.					
244	N6	Verify all units are in receipt of OPTASK COMMS.					
245	N6	Verify receipt of Underway Communications Plan from all units.					
	POC	D<10 ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
246	Department Heads	Submit appropriate messages to gaining fleet.					
247	N8	Complete vehicle loadout.					
248	N6	Transmit termination request for Communications Guard, Request temporary frequencies for in-house working, comms (Saber, Spectra, PRC's, etc), Request Sonobuoy Channel frequency assignments (If Applicable).					
249	N8	Weigh, mark and clean vehicles.					
250	N4	Verify/update CASREPS.					
251	N1	Verify/update Page Two's and SGLI					
252	CRC	Finalize and post access lists.					
253	N6	Prepare communication check message for release at 7 days prior to deployment.					
254	N3	Prepare rough daily schedule for Deployment. (Battle Rhythm Confirmed)					
255	N8	ALCE team preliminary inspection of loadout and review of loadout plan.					
256	CDRE / DEP / N1	Consolidated instructions to advance party.					
257	CDRE / DEP / FPO	Conduct Level I AT/FPO, ORM/Safety, Deadly Force/ROE Briefs.					
	POC	D<5 ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
258	DEP / N1	Advance party departs. (If Needed)					
259	N6	Communicate with NCTAMSPAC to ensure all SATCOM circuits will be up and active on specified date.					
	POC	D<3 ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
260	N6	Draw CMS/EKMS and COMTAC material.					
261	N6	Shift communications guard.					
262	DEP	Review planning checklist and validate all required actions complete.					
	POC	D<2 ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
263	N6	Ensure all underway checks are complete for all units (Rotating, Radiating and all Communications Gear (set up communications checks between the three units (message will be released 6 days prior))).					
	POC	D=0 ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
264	N3	Final Operational brief/update to wardroom.					
265	N3	Release OPREP.					
	POC	DURING DEPLOYMENT ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
266	N1	Deputy / Commodore Turnover Letters.					
267	Department Heads	Special FITREP's / EVAL's for Turnover.					
268	Department Heads	MIDTERM Counseling.					
269	Department Heads	Regular FITREP's / EVAL's for Turnover.					
270	CDRE	Submit daily Operational Feeder Report (OPREP-5). Submit a daily SITREP by message to the Task Force/Group Commander.					
271	Public Affairs Officer	Prepare draft public affairs release. Obtain approval from operational commands Public Affairs Officer prior to departure from AT.					
272	N1 / N3	120 days before return home conduct ULTRA.					
273	N3	90 days before return home start assembling turnover letter inputs and enclosures to include: listings of hard to obtain repair parts, consumables, charts, copies of standing OPGENS and related policy directives, specific problem areas encountered, training and material preparation suggestions, lessons learned, and copies of in-theater policy guidance messages.					
274	N3	30 days before return home prepare post deployment report.					
275	N3	30 days before return home issue: leave, liberty, duty, schools policy and schedules for the post deployment leave and upkeep period.					
276	N1	30 days before return home prepare post deployment/end of mission awards.					
277	N3	30 days before return home hold post deployment readjustment/reunion with dependent					
278	N3	14 days before return home ensure LOGREQ for San Diego has Military Customs/Agriculture Inspector procedure requests.					
279	Medical	Post deployment Health Assessments Due (NLT) 30 days after redeployment.					
280	Medical	PPD Test within 30 days of redeployment.					
281	Medical	HIV draw within 30 days of redeployment.					
	POC	PD<30 ITEM DESCRIPTION	REFERENCE	GOAL DATE	STATUS	% COMP	COMP DATE
282	CDRE	Submit Post-Deployment report and NULLS.					
283	N3	Post Deployment Brief and Lessons Learned.					

TERMS

A

Advance base – A general term designating a base located in or near forward areas outside the zone of the interior; the primary mission of which is to support wartime operations. Such bases are deployed after declaration of an emergency or upon mobilization in direct support of combatant units, and are usually of temporary wartime construction.

Aggregated Operations - Operations where all the elements of the ARG and MEU are operating within mutually supporting distances of one another. All the capabilities of the ARG and the MEU can be brought to bear on mission accomplishment.

Assault Area – That area that includes the beach area, boat lanes, line of departure, landing ship area, transport area and fire support area in the vicinity of the boat lanes.

Advance Force – That part of the amphibious task force that precedes the main body to the objective area. The advance force usually is dissolved on d-day and redistributed to other parts of the amphibious task force.

Amphibious Bulk Liquid Transfer System – Hose reel system providing capability to deliver fuel and/or water from ship-to-shore. Also called ABLTS.

Amphibious Construction Battalion – A commissioned naval unit subordinate to the commander of the Naval Beach Group, designed to provide an administrative unit from which personnel and equipment are made available to operate pontoon causeways, transfer barges, and warping tugs, and to meet salvage requirements of the Naval Beach Group.

Amphibious forces – A general term used to describe the naval forces and amphibious troops, together with supporting forces that are organized, equipped and trained to conduct an amphibious operation. The administrative title of the amphibious type command of a fleet. An amphibious force consists of an amphibious force staff, subordinate amphibious groups staffs, amphibious squadron, transport division and other amphibious staff organizations, amphibious type vessels, close support ships, mainly of an amphibious nature or in support of, such as underwater demolition teams and naval beach groups.

Amphibious lift – The total capacity of assault shipping utilized in an amphibious operation, expressed in terms of personnel, vehicles, and measurements or weight tons of supplies.

Amphibious reconnaissance – A general term relating to a landing conducted by minor elements, involving stealth rather than force of arms.

Amphibious Troops – Troop components, ground and air, assigned to make a landing. The term is synonymous with the generic term “landing forces” and may include helicopter-borne, air borne, and air transported forces as well as troops landed by waterborne methods.

Approach schedule – In an amphibious operation, a schedule prepared by the transport commander in coordination with the battalion landing team commander for the movement of each assigned wave of the boat group from the rendezvous area to the line of departure and then to the assigned beach so that the landing of each wave will be made at the prescribed time.

Arrival and Assembly Area – An area identified by the designated commander in coordination with the unified commander and host nation for arrival, offload, and assembly of forces and equipment and supplies, and preparations for subsequent operations. The arrival and assembly area is administrative in nature and does not denote command of a geographic area. Such an area may be inside an amphibious objective area. Within the arrival and assembly area, coordination authority for the following is implied for the designated commander: prioritization and use of airfield(s), port, beach facilities, road networks; air traffic control; and logistics support activities. Also called AAA.

Arrival and Assembly Operations Group – A staff agency composed of the Marine air- ground task force personnel and a liaison from the Navy support element to control the arrival and assembly operations. Also called AAOG.

Artillery Battery – A company-sized unit, often used as a provisional rifle company, also provides the battalion with long-range indirect fire support (when operating ashore). The Battery brings 105/155mm towed artillery and trucking support. The trucks are often used for other non-artillery-related missions.

Assault – In an amphibious operation, the period of time from the crossing of the line of departure, by the first scheduled waves, to the seizure of initial objective.

Assault Amphibian Vehicle (AAV) Platoon – Provides mechanized lift for mechanized company.

Assault craft – A landing craft or amphibious vehicle employed for landing troops and equipment in an assault or on an enemy beach.

Assault Echelon – The element of a force that is scheduled for initial assault on the objective area. In an amphibious task force, it consists of Navy amphibious ships and the assault troops, vehicles, non-self-deployable aircraft, equipment, and supplies required to initiate the assault landing.

Assault Follow-on Echelon – In amphibious operations, that echelon of the assault troops, vehicles, aircraft equipment, and supplies which, 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 areas not later than five days after commencement of the assault landing.

Assault shipping – Those vessels that are utilized for the rapid unloading in the initial stages of amphibious operations, of troops, vehicles, equipment, or supplies directly over the beaches, or indirectly by discharging off shore into landing craft or landing ships.

Assault waves – In an amphibious operation, the scheduled boat waves in the approach to the beach whose time of landing is fixed in relation to h-hour.

Amphibious vehicles – A wheeled or tracked laying vehicle capable of operating on both land and water, designed for specific fighting functions.

Attack landing – An attack against enemy defenses by troops from ships, aircraft, boats, or amphibious vehicles.

B

Battalion Landing Team – In an amphibious operation, an infantry battalion specifically reinforced by necessary combat and combat service support; the basic unit for planning an assault landing.

Base development – The improvement and expansion of the resources and facilities of an area to support military operations. It provides the framework for the logistics support of combat forces deployed in accordance with strategic war plans.

Beach – The area extending from the shoreline inland to a marked change in physiographic form or material, or to the line of permanent vegetation (coastline).

- a. Tactical – That portion of the shoreline normally required for the landing of a force of approximately one battalion landing team. However, it may be a portion of the shoreline constituting a tactical locality, such as a bay, to which may be assigned a force larger or smaller than a battalion.
- b. Technical (shore) – The zone extending from the low water mark to the base of a cliff, dune, or the landward limit of effective storm wave action.

Beach capacity – An estimate, expressed in terms or measurements or weight tons, of the cargo that may be unloaded on a strip of shore per day from landing craft, ships, or lighters. The estimate is based on an evaluation of the physical characteristics of the shore in relation to sea, tides, and weather expectancy. The estimate is without reference to clearance capacity or to the storage capacity behind the beach area.

Beach diagram – A diagram showing the landing area to be used by various landing teams. Such areas are usually named by colors.

Beach dump – An area adjacent to a beach utilized by a shore party for the temporary stowage of supplies.

Beach exit – A route for land movement of personnel and material from a landing beach. This term include entrances to the beach used by returning vehicles.

Beach flag – A flag with colored background and vertical stripes. The background indicates the color designating the beach; the stripes indicate the number of the beach. It is not suitable for a beach marker. It is usually used on control and other craft that serves a designated area.

Beach Group – A permanently organized naval unit consisting of a Headquarters unit, Beachmaster unit, Amphibious Construction Battalion, and Assault Craft Units. It is designed to provide an administrative group from which the required component may be drawn to form:

- a. Elements for accomplishment of certain pre-D-day and D-day missions
- b. An element to support a shore party
- c. A naval task component to which may be attached other naval units to perform tasks afloat or ashore in the objective area.

Beachhead – A designated area on a hostile shore which, when seized and held insures the continuous landing of troops and material and provides maneuvering space requisite for subsequent projected operations ashore. It is the physical objective of an amphibious operation.

Beach marker – A sign or device to identify a beach or certain activities thereon, for incoming waterborne traffic. Markers may be panels, lights, buoys, or electronic devices.

Beach organization – In an amphibious operation, the planned arrangement of personnel and facilities to effect movement, supply, and evacuation across beaches and in the beach area for support of a landing force.

Beach Party – The naval component of the shore party. It provides close offshore control to facilitate beaching landing craft, landing ships, and amphibious vehicles. It assists as required in retraction and salvage of landing craft.

Beach services – An accumulation of supplies of all classes established in dumps on the beach.

Beach salvage team – Personnel and equipment responsible for salvaging beached or stranded landing craft. The beach salvage team becomes a portion of the BPT when the beach party is activated.

Beach support area – The area to the rear of the landing force or elements thereof, established and operated by shore party units, which contains the facilities for the unloading of the troops and material and the support of the forces ashore; it includes facilities for the evacuation of wounded prisoners of war, and captured material.

Beach width – The portion of the shore lying between the lowest low water line and the line, which the highest storm waves reach.

Berm – A nearly horizontal portion of the beach or backshore formed by the deposit of material under the influence of waves.

Berm crest – The seaward limit up the shore; the highest point of a berm.

Boat assault – A boat used to carry assault troops, either in a river crossing or an amphibious operation.

Boat assembly area – An area in which boats are assembled preparatory to, or after, the ferrying of troops and supplies. In an amphibious operation the area is fixed in reference to a transport from which troops and supplies are loaded.

Boat group – The landing craft organization for landing a battalion landing team. It also denotes the landing craft carried by an attack transport.

Boat pool

- a. Additional boats available to transports to aid or replace boats that become inoperative prior to and during an amphibious operation.
- b. A group of naval personnel who operate and maintain all small boats and barges at an advanced base, including landing craft retained at the base.
- c. A pool of boats and landing craft established in order to provide for harbor needs for personnel and the unloading of follow-up shipping.

Boat team – A subordinate unit of the landing team, constituted to function from the pre-debarkation phase of the landing until normal unit organization has been re-established ashore. It is the personnel, with their equipment, loaded in one landing boat, charged with the performance of a task after debarking from the landing boat.

Boat wave – A boat wave consists of the landing craft or amphibious vehicles within a boat group that carry the troops that are to be landed simultaneously.

Broach – To be thrown broadside on the beach or a sandbar. A beached landing craft is forced parallel to the beach (and further grounded) by surf action.

Build-up – The process of obtaining prescribed strength of units and levels of supply; also may be applied to the means of accomplishing this process.

C

Cargo classification – The division of military cargo into categories for combat loading aboard ships:

- a. Vehicles – wheeled or tracked equipment, including weapons, which require certain deck space, headroom, and other definite clearances.
- b. General – cargo which is susceptible to loading in any place, such as boxes, bales, barrels, crates, packages, bundles, and pallets.
- c. Perishables – cargo requiring refrigeration, such as meat, fruit, fresh vegetables, and medical department biological material.
- d. High explosives – cargo such as ammunition, bombs, depth charges and demolition material.
- e. Inflammables – cargo such as drummed gasoline and oils.
- f. Chemical ammunition – cargo such as white phosphorous smoke.
- g. Special – cargo that requires special handling or protection, such as pyrotechnics, detonators, watches, and precision instruments.
- h. Troop space – cargo such as sea or barracks bags, bedding, rolls or hammocks, locker trunks, and office equipment, which is normally stowed in an accessible place.

Heavy-lift cargo –

- a. A heavy piece of cargo that requires a heavy lift crane to raise and lower it.
- b. In Marine Corps usage, individual units of cargo which exceed 500 lbs. in weight or 125 ft³ in volume.

Cargo element – A group of pontoon barges (usually eight), assigned for a specific task during an assault.

Class Supplies

- a. Class I – rations and water; also Post Exchange supplies for issue.
- b. Class II – authorized articles, such as clothing, weapons and vehicles, for which allowances are fixed.
- c. Class III – fuels and lubricants.
- d. Class IV – supplies for which initial issues are not prescribed in the table of allowances; i.e., PX supplies, special clothing, fortification materials, etc.
- e. Class V – ammunition, mines, explosive, fuels, detonators, chemical warfare agents.

Clearance capacity – An estimate expressed in terms of measurement or weight tons per day of the cargo that may be transported inland from a beach or port over the available means of inland transportation including roads, railroads, and inland waterways. The estimate is based on an evaluation of the physical characteristics of the transportation facilities in the area.

Combat Engineer Battalion Detachment – Battalion of Marine Combat Engineers with specialized training and equipment with limited capability to construct obstacles and conduct demolitions.

Combat loading – The arrangement of personnel and the stowage of equipment and supplies aboard ship in a manner designed to conform to the anticipated tactical operation of the organization embarked. Each individual item of equipment and supplies must be so stowed aboard the ship that it can be discharged and dispatched to the beach at the time and in the sequence which it has been previously determined will most effectively promote the successful completion of the mission. Also called “combat unit loading”.

Command – An order given by a commander, that is, the will of the commander expressed in a definite form for the purpose of bringing about a particular action in a specific way.

Command – A unit or units, or an area, under the command of one individual.

Commencement Day (C-Day) – The unnamed day on which a deployment operation commences. The deployment may be movement of troops, cargo, weapon systems, or a combination of these elements using any or all types of transport.

Commercial loading – The loading of troops and/or equipment and supplies in a vessel for maximum utilization of personnel and cargo space.

Consolidated vehicle table – A summary of all vehicles loaded on a ship, listed by types, and showing the units to which they belong.

Constraint – Restricted or confined within prescribed bounds.

Construction Battalion – See Amphibious Construction Battalion.

Control – Authority which may be less than full command exercised by a commander over part of the activities of subordinate or other organizations.

Control group – Personnel, ships, and craft designated to control the waterborne ship-to-shore movement.

Control Point – The station of unit’s headquarters, where the commander and the staff perform their activities. In combat, a unit’s headquarters is often divided into echelons; the echelon in which the commander is located or from which he operates is called the CP.

Counterintelligence – That aspect of intelligence relating to all security control measures, both active and passive, designed to insure the safeguarding of information, personnel, equipment, and installation against espionage and sabotage against subversive activities of foreign powers and of disaffected or dissident groups of individuals which constitute a threat to the national security.

Cover

- a. The action taken by land, air, or sea force to protect units.
- b. Shelter or protection.
- c. Cover force
- d. A force operating apart from the main force for the purpose of intercepting, engaging, delaying, disorganizing, or deceiving the enemy before he can attack the force covered.
- e. Anybody or detachment of troops that provides security for a larger force by observation, reconnaissance, attack, or defense, or by any combining of these methods.

Current – The mass movement of water in one direction for an extended period of time.

D

D-Day – The term used to designate the unnamed day on which an operation commences, or is to commence. This operation may be the commencement of hostilities, the day of an assault landing, a bombardment, etc. Whereas “D” is the letter customarily employed to designate the day on which an operation commences, if more than one such event is mentioned in a single plan any letter (except “M”) may be used. The equivalent rule “M” is, by custom, used to designate mobilization day, applies to the term “H–Hour.” Time is indicated by a letter, which shows the unit of time employed, and numerical figures (with a minus or plus sign) to indicate the amount of time before or after the referenced event.

For example: “D” is for a particular day, “H” for an hour. Similarly, “D+7” means 7 days after D-Day; H+2 mean 2 hours after H-Hour. However, the letter M plus a numerical figure stands for months following mobilization day.

Demonstration – An exhibition of force, such exhibition being conducted in a manner so as to give the impression to the enemy that a landing is to be made in the vicinity of the exhibition; such exhibition may be limited to pre d–day naval gunfire, or it may be carried through all phases of an amphibious operation and ship–to–shore movement to include the movement of landing craft or amphibious vehicles from the line of departure toward selected landing beaches.

Disaggregated Operations - Require elements of the ARG/MEU to function separately and independently, regardless of time and distance. With elements under a command relationship that changes/limits the ARG and MEU commanders’ control of their forces. The ARG/MEU may be disaggregated within a GCC’s area of responsibility (AOR) or elements of the ARG/MEU may be assigned a different GCC.

Distributed Operations - Operations where subordinate elements increase physical separation to mitigate a threat or better support mission accomplishment while not maintaining mutual support through fire or maneuver. Dispersed elements remain under the command and control of their parent unit and their activities support its mission.

In ARG/MEU operations, elements of the ARG/MEU function separately for various durations and/or distances, beyond the range of mutual support, with the ARG/MEU commanders retaining control of all forces under the same GCC.

Diversionsary landing – A subsidiary landing conducted for the purpose of diverting hostile attention and strength from the main landing.

Drop zone (DZ) – A specified area upon which airborne troops, equipment, and supplies are dropped by parachute, or on which supplies and equipment may be delivered by free fall.

Dump – A temporary stock of supplies or a place of stowage established in the field or afloat where military supplies are held temporarily. When supplies are issued from dumps, the latter becomes distribution points.

E

Echelon

- a. The subdivision of headquarters, i. e., the forward echelon, the rear echelon, etc.
- b. Level of command, compared to regiment, division is a higher echelon while battalion is a lower echelon.
- c. The different fraction of a command in the direction of depth, to each of which a principal combat mission is assigned, such as attack echelon, support echelon, reserve echelon, etc.
- d. A formation in which the sub-divisions are placed one behind the other extending beyond and wholly or partly unmasking each other.

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. Also called ELCAS.

Embark – To go aboard a vessel.

Embarkation – The loading of troops with their supplies and equipment in vessels and/or aircraft.

Embarkation area – Area ashore, including a group of embarkation points in which final preparations for embarkation are complete and through which assigned loads for craft and ships are called forward to embark.

Embarkation officer – A special officer serving on an army, air force, or marine staff who advises the commander thereof, of matters pertaining to embarkation planning, loading, and embarkation of the command aboard ships. The designation of personnel at specific command levels is accomplished by an appropriate prefix to the basic title, as in “division embarkation officer.”

Embarkation order – An order specifying day, time, routes, and methods of movement to shipside for both personnel and equipment.

Embarkation team – All personnel with supplies and equipment embarked or to be embarked (or combat loaded) aboard one transport. A battalion landing team is normally the nucleus of the embarkation team. Other units, or groups of units, of similar size may also be formed into embarkation teams.

Evacuation control vessel – In an amphibious operation, a vessel designated as a control point for landing craft, amphibious vehicles, and helicopters evacuating casualties from the beaches. Medical personnel embarked in the evacuation control vessel effect distribution of casualties throughout the attack force in accordance with the ship's casualty capacities and specified medical facilities available, and perform emergency surgery.

Evacuation policy – A command decision, indicating the length in days of the maximum period of non-effectiveness that patients may be held within the command for treatment. Patients who, in the opinion of responsible medical officers, cannot be returned to duty status within the period prescribed are evacuated by the first available means, provided the travel involved will not aggravate their disabilities.

Exploding surf – A highly violent type of plunging breaker wherein large amounts of air are trapped under the toppling canopy of water formed by the wave crest. The trapped air pocket escapes explosively behind the wave, throwing up large fountainheads of water.

E

Fleet Marine Force (FMF) – A balanced force of combined arms comprising land, air, and service elements of the United States Marine Corps. A fleet marine force is an integral part of a U. S. fleet and has the status of a type command.

Floating dump – A dump of critical supplies held on boats, barges, or amphibious vehicles established afloat early in an amphibious operation in the vicinity of a control vessel for quick delivery to assault troops ashore. Also called an offshore dump.

Floating reserve – In an amphibious operation, reserve troops that remain embarked until needed.

Follow-up shipping – In an amphibious operation, those forces which are scheduled to arrive in the objective area after the assault and prior to the build-up.

Force

- a. A body of troops, ships, or aircraft, or combination thereof.
- b. In naval usage, a major subdivision of a fleet.

Foreshore – The section of the beach between the low water line and the crest, or limit of the normal rush of waves.

G

General unloading period – That part of the ship to shore movement in which unloading is primarily logistics in nature and emphasizes speed and volume without regard to class, type, or priority of cargo.

Geographic – A system or network of points of fixed geodetic positions, with latitude, longitude, and elevation determined with surveying instruments.

Ground swell – The swell encountered in shoal water and which is practically constant.

H

Hard – A portion of the beach especially prepared with a hard surface extending into the water, employed for the purpose of loading or unloading directly into or from landing ships or landing craft.

H–Hour – The term customarily used to designate the hour for an attack to be launched, for an assault wave to land, or for a movement to begin.

Hospital transport – A designated navy vessel provided with additional medical personnel and increased facilities for evacuation of casualties.

Hydrographic section – A section of a beach party whose duties are to clear the beach of damaged boats, conduct hydrographic reconnaissance and assist in moving underwater obstructions.

I

Initial unloading period – Unloading is primarily tactical in character and must be instantly responsive to land force requirements.

Inlet – A water channel through a barrier or bay–mouth bar; permits tidal flow.

Inshore – Toward the shore.

Intelligence – Knowledge achieved by logical analysis and integration and interpretation of collected data concerning one or more aspects of foreign nations and areas and immediately or potentially significant to planning.

J

Joint Amphibious Task Force – A temporary group of units single commander, organized for the purpose of engaging in an amphibious landing, and assault on hostile shore (previously called joint expeditionary force).

Joint exercise – A simulated combat operation of units of two or more services for purposes of training, involving joint planning, preparation, execution.

Joint force – A general term applied to a force which is composed of significant elements of the Army, Navy, (Marine Corps), and Air Force, or any two of these services, operating under a single commander authorized to exercise unified command or operational control over such joint forces.

Joint Logistics Over-the-Shore Commander – The joint logistics over-the-shore (JLOTS) commander is selected by the joint force commander and is usually from either the Army or Navy components that are part of the Joint Force commanders 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.

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 commanders.

Joint Task Force (JTF) – A joint force composed of assigned or attached elements of the Army, Navy (Marine Corps), and Air Force or any of two of these services.

L

Landing area

- a. That part of the objective area within which are conducted the landing operations of an amphibious force. It includes the beach, the approach to the beach, the transport areas, the fire support areas, the air occupied by close supporting aircraft, and the land included in the advance inland to the initial objective.
- b. Airborne – the general area used for landing troops and material either by serial delivery or air landing. This area includes one or more drop zones or landing strips.

Landing craft – A craft employed in amphibious operations, specifically designed for carrying troops and equipment capable of beaching, unloading, and retracting.

Landing craft availability table – A tabulation of the type and number of landing craft that will be available from each vessel of the transport group. The table is the basis for the assignment of landing craft to the boat groups for ship-to-shore movement.

Landing craft and vehicle assignment table – A table showing the assignment of personnel and material to each landing craft and amphibious vehicle and the assignment of the landing craft and amphibious vehicles to waves for the ship-to-shore movement.

Landing diagram – In the assault phase of the amphibious operation, a diagram that shows the organization of the boat group and/or amphibious vehicles or landing team. It shows the scheduled waves; the formation, number and type of landing craft amphibious vehicles, or landing ships in each wave; and the interval between waves expressed in minutes.

Landing force – A subordinate task organization, a schedule which shows the beach, hour, and priorities of landing of assault units, and which coordinates and executes the scheme ashore.

Landing Force Support Party – A temporary landing force organization composed of Navy and landing force elements, that facilitates the ship-to shore movement and provides initial combat support and combat service support to the landing force. The landing force support party is brought into existence by a formal activation order issued by the commander, landing force. Also called LFSP. Note: The forward echelon of the combat service support element formed to facilitate the transportation and throughput operations. In maritime prepositioning force operations, the LFSP is responsible to the MAGTF commander for the reception of maritime prepositioned equipment and supplies and personnel at the beach, port, and arrival airfield, and movement control to the unit assembly areas.

Landing Ship Dock (LSD) – The LSD is designed to load, transport to the objective area and launch loaded amphibious landing craft and vehicles. Also may render limited docking and repair service to small ships and craft.

Landing site – A continuous segment of coastline over which troops, equipment and supplies can be landed by naval forces.

Landing zone – A specified zone within an objective area, used for landing of assault aircraft.

Left (right) – A term used to establish the relative position of a body of troops ashore. The person using the terms “left” and “right” is assumed to be facing in the direction of the enemy, regardless of whether the troops are advancing or withdrawing.

Lighter – A small craft designed to transport cargo or personnel from ship to shore. Lighters include amphibians, landing craft, discharge lighters, causeways, and barges.

Ligherage – The process in which small craft are used to transport cargo or personnel from ship-to-shore using amphibians, landing craft, discharge lighters, causeways, and barges.

Line of communication – All the routes, land, water, and air, which connect an operating military force with its base of operations, and along which it’s supplies and reinforcements move.

Line Of Departure (LOD) – In naval usage, a suitable marked offshore coordinating line to assist assault craft to land on designated beach at scheduled times.

Loading plan

- a. **Combat** – The arrangement of personnel and the stowage of equipment and supplies aboard ship in a manner designed to conform to the anticipated tactical operation of the organization embarked. Each individual item of equipment and supplies must be so stowed aboard the ship that it can be discharged and dispatched to the beach at the time and in the sequence which it has been previously determined will most effectively promote the successful completion of the mission. Also called “combat unit loading”.
- b. **Commercial** – The loading of troops and/or equipment and supplies in a vessel for maximum utilization of personnel and cargo space.

Local naval defense – The defense of a landing area, the water areas of naval bases or the local water areas of a base, by those naval forces charged with the conduct of naval operations against enemy surface or marine attack.

Lodgment area – That area, resulting from a consolidation of one or more beachheads, which is the initial base of operations required for support of extended operations overland.

Logistics – That part of the entire military activity that deals with:

- a. Design and development, acquisition, storage, movement, distribution, maintenance, evacuation, disposition of material.
- b. Movement, evacuation and hospitalization of personnel.
- c. Acquisition or furnishing service. It comprises both planning, including determination of requirements, and implementation.

Logistics Over-the-Shore Operations – The loading and unloading of ships with or without the benefit of fixed port facilities, in friendly or non-defended territory, and in time of war, during phases of theater development in which there is no opposition by the enemy.

Long shore current – A current that flows parallel to the shoreline inside the breakers and found only on straight beaches. Also called littoral current.

M

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 elements will always be mission dependent. The flexibility of the organizational structure allows for one or more subordinate MAGTFs, other Service, and/or foreign military forces to be assigned or attached.

MAGTF Offload Liaison Team—A task organization assigned to both the offload preparation party and the offload control unit to assist in communicating the MAGTF commander's warfighting and offload priorities, and to provide technical supervision and direction on Marine Corps offload preparation party and debarkation matters. Also called MOLT.

Maritime Prepositioning Force Operation – A rapid deployment and assembly of a Marine Expeditionary Force in a secure area using a combination of strategic airlift and forward-deployed maritime prepositioning ships.

Maritime Prepositioning Ships—Civilian crewed Military Sealift Command chartered ships which are organized into three squadrons and are usually forward deployed. These ships are loaded with prepositioned equipment and 30 days of supplies to support three Marine Expeditionary Forces.

Marker vessel – A vessel that takes accurate station on a designated control point. It may fly identifying flags by day and show lights to seaward by night.

Marriage – The securing of the ramp of a landing ship to the seaward end of a causeway.

Marry – To place the ramp of one vessel to the ramp or stern gate of another craft or ship for the purpose of transferring cargo from one to the other.

Minor – A joint training exercise held on the initiative of one or more joint force commanders for the forces under their respective commands; or a small-scale training exercise held on the initiative of one of the services, or subordinate commander thereof, and in which two or more services participate.

Movement phase – The navy plan providing for the movement of the amphibious task force to the objective area.

N

Naval Beach Group – A permanently organized Naval command, within an amphibious force, comprised of a command and staff, a Beachmaster Unit, an Amphibious Construction Battalion, and an Assault Craft Unit, designed to provide an administrative group from which required Naval tactical components may be made available to the attach force command and to the amphibious landing force commander to support the landing of one reinforced division.

Navy-Days – Falls on O-2. These are the days the NSE makes final preparations for the offload.

Naval Expeditionary Combat Command – Functional commander in control of manning, training, equipping and organizing forces that will execute force protection, shore based logistical support and construction missions across the joint operational spectrum.

Navy Cargo Handling Battalion – A mobile logistics 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 prepositioning ships and merchant break-bulk or container ships in all environments; (b) to operate an associated temporary ocean cargo terminal; (c) load and offload Navy and Marine Corps cargo carried in military-controlled aircraft; (d) to operate an associated expeditionary air cargo terminal.

Naval support area – A sea area assigned to naval vessels detailed to support a landing.

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.

Navy Expeditionary Logistics Support Group – The quick response cargo-handling units of the Navy specialize in open ocean cargo handling. Also called NAVELSG.

Night landing (amphibious) – A landing attack in which the ship-to-shore movement is accomplished and the initial objective is seized or expected to be seized under the cover of darkness.

O

Objective Area (OA) – A defined geographical area within which is located the objective to be captured or reached by the military force. Competent authority for purposes of command and control defines this area.

Offshore Bulk Fuel System – The system used for transferring fuel from points offshore to reception facilities on the beach. Also called OBFS.

Offload Day (O-Day) – Unnamed day when the maritime prepositioning force offload commences.

Offload Preparation Party – A temporary task organization of Navy and Marine maintenance, embarkation, equipment operators, and cargo handling personnel deployed to the maritime prepositioning ships squadron before or during its transit to the arrival and assembly area to prepare the ship's offload systems and embarked equipment for offload. Also called OPP.

On-call wave – Formations of landing craft, amphibious vehicles, landing ships or helicopters carrying those elements of the landing force for which an early need ashore is anticipated, but cannot be accurately predicted.

Operation plan – A plan for operations extending over a considerable space and time, and usually based on stated assumptions. It may cover a single operation or a series of connected operations to be carried out simultaneously, or in succession. It is the form of directive employed by high echelons of command in order to permit subordinate commanders to prepare their supporting plans or orders.

P

Pallet – A portable platform used for the landing, loading, stowage, and unloading of material.

Palletize – To pack and secure supplies on a pallet.

Phase – A step in the operation, at the end of which a reorganization of forces may be required and another action initiated. Although certain phases may overlap in point of time, they usually occur in the following order:

- a. Planning – the preparation and coordination of forces selected for the operation.
- b. Training and rehearsal – the concentration of forces selected for the operation, their organization into an integrated task force, and their joint training.
- c. Mounting – the assembly of troops, equipment, supplies, and vessels at places of embarkation and the actual embarkation of the landing area.
- d. Movement to the objective – the sea journey from points of embarking to the landing area.
- e. Pre-landing operations – reconnaissance, minesweeping, bombardments, bombing, underwater demolitions, and destruction of beach obstacles.
- f. Attack and capture of the objective – the assault against the hostile shore, including the completion of tactical operations to secure the force objective.
- g. Consolidation – tactical organization and consolidation of beachheads.
- h. Base development – establishment of facilities and development of the area for the purpose of supporting projected operations.

Plunging breaker – The type of breaker in which a long portion of the crest peaks up so that the water at the top of the crest rushes forward and crashes violently into the preceding trough.

Pre-H-Hour transfer – The transfer of tactical/logistics (TACLOG) control parties, and necessary troops and equipment from transports to landing ships and control ships, in preparation for the ship-to-shore movement.

Propulsion kit – A heavy duty, single-screw “outboard motor” powered with a 6-cylinder, 2-cycle, fresh water-cooled diesel engine developing 225hp used to propel barges and warping tugs.

R

Raid (amphibious) – Landing operations conducted to gain information, destroy enemy installations, or to harass the enemy.

Ramp – A bulkhead hinged at the bottom, dropped from the bow or stern of a vessel to form a brow for discharging passengers and cargo on a beach.

Ramp block – Fabricated hardwood timbers used to bridge the drop from an LST ramp to a married causeway.

Range marker – Two upright markers which may be lighted at night, placed so that when aligned, the direction indicated assists in piloting. May be used in amphibious operations to aid in beaching ships or craft.

Reconnaissance Platoon – Not all MEUs deploy with a “Recon” detachment. Due to a reorganization of the Recon Battalion in MARDIV, there is a shortage of reconnaissance units. This unit would provide distant reconnaissance for the battalion. When a reconnaissance detachment is not available, the battalion usually increases the size of their organic Scout Sniper platoon to perform the same missions.

Regimental Landing Team (RLT) – in an amphibious operation, a task organization for landing comprised of an infantry regiment reinforced by those elements that are required for initiation of its combat function ashore. This normally will embrace the assault battalion landing teams, a regimental landing team reserve, as well as other elements required by the situation. Usually associated with Marine Corps organization.

Rendezvous area – In an amphibious operation, the area in which the boats rendezvous after being loaded and prior to movement to the line of departure.

Restraint – A rule or condition that limits freedom.

Rise-to-Run Ratio – The increase in height (or rise) of the slope as it “runs” over a lateral distance (Example: a beach gradient of 1:15 means the slope increases one foot in height for every 15 feet of distance inland.)

Roll-on/Roll-off Discharge Facility – Provides a means of disembarking/embarking vehicles from a roll-on/roll-off ship to lighters and back. Also called RRDF.

Romeo Day (R-Day) – The day designated to conduct the rehearsal.

Romeo Hour (R-Hour) – The hour designated for the assault on R-Day, also has special significance in UDT operations.

S

Salvage group – In an amphibious operation, a naval task organization designated and equipped to rescue personnel and to salvage equipment and material.

Sand bar – A bar or ridge of sand built up to, or near to, the surface of the water by currents in a river or by wave action in coastal waters.

Scarp – An almost perpendicular slope occurring along the beach or backshore caused by erosion of berm crest.

Sea approach – The approach to a beach area that terminates at the low water line.

Sea State – A scale that categorizes the forces of progressively higher seas by wave height.

Secondary landing – A landing usually made outside the designated landing area, the purpose of which is to support the main landing directly or indirectly.

Selective loading – The arrangement or stowage of equipment or supplies aboard ship in a manner designed to facilitate issues to units.

Serial number – One of the subdivisions into which personnel, vehicles, or materials is arranged for movement by March, or by land, water or air transport. a serial consists of one unit, or of several units or parts of units, placed under a single commander for movement.

Ship-to-Shore movement – The phase of an amphibious operation pertaining to the timely deployment of the landing force from the assault shipping to the designated shore positions in the landing area.

Shoreline – The line formed by joining of the sea and the land. This line is migratory, oscillating with the foreshore.

Shore Party – A special task organization formed for the purpose of facilitating the landing and movement off the beaches of troops, equipment, and landing force supplies, and for the evacuation from the beaches of casualties and prisoners of war. It comprises elements of both the naval and landing forces; its activation and command are a function of the landing force.

Shore Party Group – The shore party organization's basically organized to support a regimental combat team in an amphibious operation; it normally includes three shore party teams. In army usage, the organization performing this mission takes the name of the major T/O&E unit involved, usually a shore battalion.

Shore Party Team – The shore party organization's basically organized to support a battalion landing in an amphibious operation. The shore party team is the basic unit of a shore party. In army usage, the organization performing this mission takes the name of the major T/O&E unit involved, usually a shore party company.

Splash line – A sufficient point off the beach where UDT swimmers are put into the water in rubber boats.

Split Operations - Split operations require elements of the ARG/MEU to function separately for various durations and distances with the ARG and MEU commanders retaining control of forces under the same GCC.

Spilling breakers – Breakers that glide forward without any plunging fall and on which isolated patches of white water appear at the crest as they gradually roll over.

Stage – To process, in a specified area, troops which are in transit from one locality to another.

T

Tow Section – Attached to the Weapons Company, provides the battalion with long range anti-tank capability.

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