THE SEABASING REPORT

UNITED STATES MARINE CORPS

Seabasing Integration, Combat Development Directorate, Combat Development & Integration

FOREWORD

Seabasing, a national capability integrated with Joint and Coalition Forces and inter-agency partners, enables naval forces to fully exploit the sea's maneuver space and generate global force power projection. Seabasing capabilities provide a naval expeditionary framework within which operational commanders can capitalize on seabasing's inherent flexibility in executing a wide array of options to extend seapower ashore across the range of military operations. Seabasing provides the means to generate Marine Corps forward presence and facilitates rapid response to emerging crises without the need to establish bases ashore. An effective Navy and Marine Corps Seabasing capabilities development process delivers the right force in the right place at the right time.

The Seabasing Report provides an update to the key warfighting capabilities and programs required for the Navy-Marine Corps team to maintain our unmatched amphibious and expeditionary expertise. In the past year we increased our amphibious warship battle force inventory as well as the inventory of ships and capabilities in the maritime prepositioning force. General Robert Neller delivered guidance as the 37th Commandant of the Marine Corps which included enhancing naval integration as a key component.

There has been tremendous progress across multiple fronts, and we will continue to work with our Navy counterparts to further advance our naval expeditionary warfighting capabilities. Together, we will pursue the best possible solutions to enhance our littoral maneuver capabilities to meet the growing demand for amphibious warfare ships and expeditionary forces well into the 21st Century. Toward that end, this Seabasing Report presents our seabasing capability objectives.

> ***"FRANKLY, WE NEED ABOUT 50 AMPHIBIOUS GRAY HULLS TO GET DONE WHAT WE NEED TO AROUND THE WORLD TODAY."***
>
> - ADMIRAL JONATHAN GREENERT
> 30TH CHIEF OF NAVAL OPERATIONS

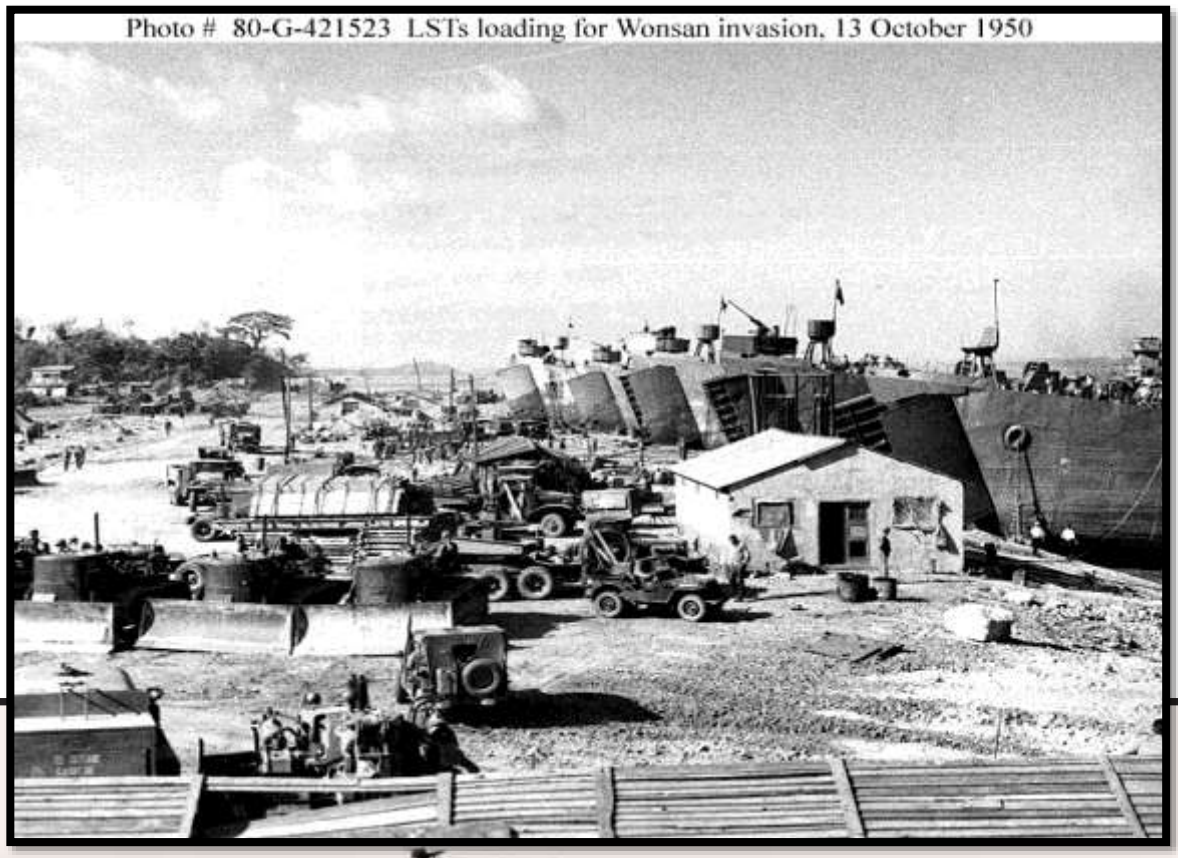

Photo # 80-G-421523 LSTs loading for Wonsan invasion, 13 October 1950

TABLE OF CONTENTS

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OVERVIEW

The Seabasing Report provides highlights of key programs managed and monitored by Seabasing Integration Division to our Navy and Marine Corps capability developers, program managers, operational planners and warfighters.

As part of the resource planning cycle, the report also outlines recommendations for materiel solutions that will enhance the ability of an afloat Marine Air Ground Task Force (MAGTF) to effectively operate in the sea base and to extend naval power and influence through the conduct of naval expeditionary operations.

Seabasing Integration Division (SID) is part of the Capabilities Development Directorate, Combat Development and Integration, Headquarters United States Marine Corps.

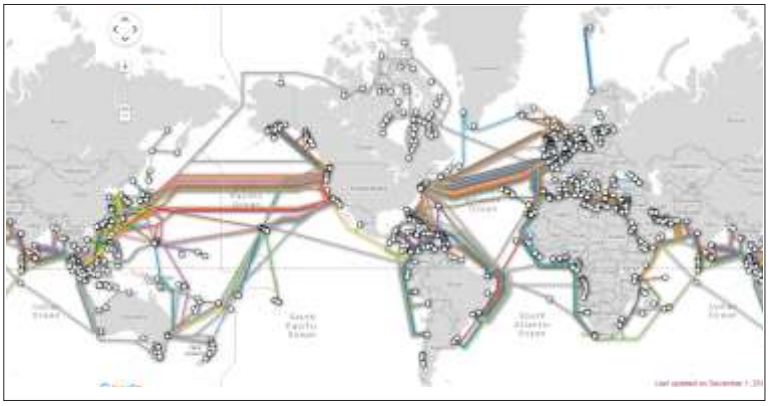
OUR ENVIRONMENT. There will be challenges and opportunities in congested and diverse areas where the sea and land merge -- the littorals. The ability to operate simultaneously and seamlessly on the seas, ashore, in the air, in space, and in cyberspace while operating across the range of military operations is a keystone of the Navy/Marine Corps team. Naval Expeditionary Forces, a combination of MAGTFs and Navy Ships, and Navy Support Elements enable us to move seamlessly through these domains providing a uniquely capable, and persistent forward presence critical to respond to crises in a dynamic threat environment.

Most maritime activities -- commercial shipping, fishing, and oil and gas extraction, for example -- take place within 200 miles of the shore, and a significant portion of the world's population is migrating to urban centers that are within 100 miles of the globe's coastlines.

- 70 % of the world is covered by ocean waters.
- 90 % of all nation-to-nation trade moves by sea.
- 95 % of all internet traffic travels under the sea.

In many cases, threats to our interests may require expanding the concept of littoral maneuver to hundreds of miles inland to resolve crises. As such, geography and demographics point towards a future security environment with a significant littoral dimension.

In a world of hidden and more diversified enemies, sea-based military power promotes security for the United States and its friends and allies. Seabasing provides decision makers a range of flexible capabilities at a critical time enabling access, freedom of movement, and action to most of the global flashpoints.



SEABASING. Seabasing is defined as the deployment, assembly, command, projection, sustainment, reconstitution and reemployment of joint power from the sea without reliance on land bases within the operational area. Seabasing incorporates the traditional naval missions of sea control, assuring access, and power projection with an increased emphasis on maneuver from the sea.

More specifically, seabasing expands access, reduces or eliminates the need to build up logistics assets ashore, reduces the operational demand for strategic sealift and airlift capabilities, and permits forward positioning of joint forces for immediate employment. All of these seabasing characteristics support national global strategic objectives and provide needed operational flexibility in an uncertain world. Through seabasing we can establish expeditionary bases at sea in support of GCC requirements.

SEABASING PRINCIPLES. Seven overarching principles are essential to seabasing operations.

Use the sea as maneuver space.
Leverage forward presence and joint interdependence.
Protect joint/coalition force operations.
Provide scalable, responsive, joint power projection.
Sustain joint force operations from the sea.
Expand access options & reduce dependence on land bases.
Create uncertainty for adversaries.

LINES OF OPERATION. The sea base supports five overlapping lines of operation called CAESR: Force Closure, Arrival and Assembly, Employment, Sustainment and Reconstitution. These lines of operations define the directional orientation of the force in time and space in relation to the enemy. They connect the force with its base of operations and its objectives.

Close	Closure of joint force capabilities to the area of crisis.
Assemble	Integration of scalable joint force capabilities within the sea base.
Employ	Employment of joint force capabilities from and supported by the sea base.
Sustain	Sustainment of selected joint forces afloat and ashore across the ROMO.
Reconstitute	Capability to recover, restore and redeploy joint combat capabilities within the maneuverable sea base for subsequent operations.

EVOLUTION OF THE SEA BASE. Traditionally, Marines conducted sea-based operations only from amphibious warfare ships. Maritime Prepositioning Ships (MPS) and Maritime Prepositioning Equipment and Supplies (MPE/S) were employed once they were assembled with fly-in echelon forces at major ports and airfield complexes ashore. Long perceived as a "break glass in time of war" capability, our maritime preposition forces are increasingly capable of conducting sea-based operations across the range of military operations – from theater security cooperation to major combat operations ashore. We continue to work with our Joint and Navy partners to address the interoperability challenges associated with sea-based operations and to take ever-greater advantage of the opportunities inherent in Seabasing.

On August 14, 2015, DC, CD&I promulgated the Maritime Prepositioning Force (Seabasing Enabled) Concept of Employment (MPF (SE) COE), which further describes the evolution of MPF in the Sea Base and the way ahead. The COE is a "living document," which will be updated and re-published, as necessary. In order to realize the full potential, as well as the limitations, of our seabasing capabilities, commanders and planners are encouraged to utilize the deployment and employment concepts set forth in the COE, along with their operational experience and innovative ideas, to exercise and expand on capabilities to ensure relevancy and responsiveness to the GCC.

As part of this process, continual efforts must be maintained, to include MPF (SE) exercise development and S&T initiatives, in order to increase the interoperability of all MPF-related assets with a widening range of ships and surface/vertical connectors. Ultimately, the objective is to have a sea base that will be capable of interfacing with any joint or combined assets, as well as those from foreign and civilian agencies, in order to support the increasing demand for sea-based support/employment. Finally, lessons learned from exercises and operations will be vital to the process of updating the COE; the feedback and validation of seabasing-enabled concepts of employment will also result in future updates to MPF and seabasing-related doctrine. The latest MPF (SE) COE may be found at: http://www.mccdc.marines.mil/Units/Seabasing.aspx.

AMPHIBIOUS & EXPEDITIONARY. The Marine Corps operates on and from the sea, in and from the air, and on the land. It is structured to operate across any domain. The Marine Corps is optimized to be expeditionary -- a strategically mobile force that is light enough to get to any crisis quickly and able to accomplish the mission or provide time and options prior to the arrival of additional forces. To Marines, being expeditionary influences every aspect of how we organize, train, and equip the Marine Corps. It is more than the ability to deploy overseas when needed. It is an institutional imperative that acknowledges the necessity to deploy rapidly, arrive quickly, begin operating immediately, endure indefinitely, and win decisively.

MARINE AIR GROUND TASK FORCE (MAGTF). The MAGTF is our Corps' principal organizational construct for conducting missions across the Range of Military Operations (ROMO). The MAGTFs provide Combatant Commanders with scalable, versatile expeditionary forces able to: assure allies, deter potential adversaries, provide persistent United States presence with little or no footprint ashore, and respond to a broad range of contingency, crisis, and conflict situations.

FOUR TYPES OF MAGTFS:

Marine Expeditionary Force (MEF)
Marine Expeditionary Brigade (MEB)
Marine Expeditionary Unit (MEU)
Special Purpose MAGTF (SPMAGTF)

This expeditionary ethos is the most critical contributor to the Corps' success in crisis response and complex contingencies. This ethos has been deliberately cultivated and exploited by Marine leaders for generations. It is this mind-set that drives our capability development efforts and ultimately generates both combat power and the organizational flexibility to accomplish diverse missions across the ROMO. Our amphibious heritage and expeditionary culture can be accurately summarized as fast, austere, and lethal.

As the Nation's Expeditionary Force in Readiness, the Marine Corps' primary contributions to the U.S. defense portfolio are "the ability to respond to crisis" and "assure littoral access." Given this emphasis, our focus ranges from security cooperation to amphibious forcible entry with special emphasis on crisis response. Fulfilling this role requires a forward posture with the right mix of capabilities to deploy, employ and sustain our forces in austere environments.

MARINE EXPEDITIONARY FORCE (MEF). The MEF is our principal warfighting organization during larger crises or contingencies., and is capable of amphibious operations and sustained operations ashore in any geographic environment. MEBs and MEUs come out of the MEF.

MARINE EXPEDITIONARY BRIGADES (MEB). The MEB is one of the largest MAGTFs, and is created from forces within the MEF. MEBs are able to respond to a full range of crises and contingencies and can serve as the enabler for joint or combined forces. With a Regimental Landing Team, Composite Marine Aircraft Group, and a Combat Logistics Regiment, the MEB is America's premier expeditionary, middleweight, rapid-response force.

The MEB is sized to be strategically agile and transportable anywhere in the world in order to respond to large-scale crises. It is powerful enough to serve as the initial entry force for a MEF or other joint and combined forces. MEBs can be deployed in several different ways, such as by an Amphibious Task Force (ATF) or together with the equipment and supplies already located aboard forward deployed Maritime Prepositioning Squadrons (MPSRON). The MEB has a force of up to 20,000 Marines.

Amphibious Task Force. (ATF) The ATF's amphibious warfare ships provide an operational platform from which the MEBs can both deploy and employ. These warships are capable of going into harm's way and serve as a cornerstone of America's ability to project expeditionary forces and respond to a wide range of crises.

Maritime Prepositioning Force (MPF). A second method of deployment is our Maritime Prepositioning Force (MPF) which combines the lift capacity, flexibility, and responsiveness of surface ships with the speed of strategic airlift.

The MPF is organized into two Maritime Prepositioning Ships Squadrons (MPSRON) with 14 maritime prepositioning ships (MPS) overall. Each MPSRON is designed to facilitate the deployment of one MEB, and are strategically forward deployed. Essential combat equipment and supplies are loaded on each MPSRON to initiate and sustain MEB operations for up to 30 days. With the introduction of the seabasing module (T-ESD, LMSR, T-AKE) each MPSRON has enhanced capability to close, assemble, employ, sustain, and reconstitute (CAESR) forces from the sea base.

MARINE EXPEDITIONARY UNITS (MEU). The MEU is the smallest of our standing MAGTFs and is created from forces within a MEF. Typically, there are 2-3 MEUs deployed somewhere in the world and ready to respond to crises at any time. Our MEUs are trained to execute up to thirteen mission essential tasks and because of this training, they are prepared to initiate a wide variety of missions within six hours of notification. The MEU is capable of conducting conventional and select maritime special purpose missions over-the-horizon, by surface and air, from the sea, and under adverse weather conditions. Forward-deployed and immediately employable, the MEU is one of the Combatant Commander's most useful tools.

SPECIAL PURPOSE MARINE AIR-GROUND TASK FORCE (SPMAGTF). The SPMAGTFs are task organized to accomplish a specific mission, operation, or regionally focused exercise. They are designated as SPMAGTF with a mission, location or exercise name. For example: SPMAGTF KATRINA, which was formed to assist the Gulf Coast states recovery from Hurricane Katrina during September 2005.

SPMAGTFs are usually formed to support combatant commander engagement, security cooperation, and civil military operations requirements.

SPMAGTF is a tailored, forward deployed, self-mobile, self-sustaining force. Ideally the SPMAGTF operates from the sea base to leverage the benefit of sovereign and mobile U.S. territory. The SPMAGTF is specifically trained to conduct security cooperation activities with partner nations to develop interoperability, facilitate access, build defense and security relationships, gain regional understanding, and position for immediate response to episodic crises.

SPMAGTF Katrina

ADAPTIVE FORCE PACKAGES (AFP). CMC and CNO were directed to redefine combinations of platforms and packages in order to optimize capabilities and reduce the operational stress on low density/high demand assets. Navy and Marine Corps efforts to this end are producing new CONOPS and informing potential ship enhancements as well as changes to ship laydown and assignment postures. The general intent is to explore how auxiliary ships can help meet phase 0/1 operational demands in order to alleviate the burden of current amphibious warfare ship shortfalls.

AFP in the generic sense is "a 'non-standard' unit, task organized to meet a specific operational requirement... may be created for specific objectives or missions. Packages range from modified naval platforms with tailored crew and equipment to blending atypical units and personnel to address unique mission needs (i.e. platform, force, equipment and sustainment). AFP (by definition) could consist of any naval vessel (e.g. battle force inventory and auxiliary platforms managed by Military Sealift Command).

Establishment of **Baseline Adaptive Force Packages** is a key part of CONOPS development and evaluation of ship/force options. The following have been developed to date:

Mission Specific AFP

SPMAGTF Crisis Response-Africa (SPMAGTF CR-AF)

Marine Rotational Force-Darwin (MRF-D)

Crisis Response AFP

Applying the tailorable and scalable MPF Crisis Response Force Package (CRFP) construct to each MPSRON will enable more efficient employment of MAGTF capability sets to support "most likely" missions short of major combat operations (MCO).

HOW MANY AMPHIBIOUS WARFARE SHIPS?

The Chief of Naval Operations and the Commandant of the Marine Corps have determined that the force structure required to support the deployment and employment of two MEBs simultaneously is 38 amphibious warfare ships.

Our required inventory demand is based on the requirement to:

1. Support the assault echelons of two MEBs.
2. Provide MEUs and SPMAGTFs enduring forward presence and capable crisis response.

We are a maritime nation. Ships are a critical component of our deployment and employment strategy, and combatant commander demand for amphibious warfare ships far exceeds the available inventory.

Requirement is 38 ships.

AMPHIBIOUS WARFARE SHIPS

Amphibious warfare ships are the centerpiece of the Navy-Marine Corps presence, forcible entry, and seabasing capabilities and continue to play critically essential roles in global operations. These ships are equipped with aviation and surface assault capabilities that, when coupled with their inherent survivability and self-defense systems, support a broad range of mission requirements.

The United States maintains the largest and most capable amphibious force in the world. Amphibious warfare ships are designed to support the Marine Corps tenets of Operational Maneuver from the Sea (OMFTS) and Ship to Objective Maneuver (STOM). They are able to maneuver in harm's way and facilitate the rapid employment and sustainment of combat power in the face of opposition. Given their inherent capabilities, these ships will continue to be called upon to support the full range of military operations from disaster relief, foreign humanitarian assistance, noncombatant evacuation operations, other crisis response missions, to major combat operations.

LHA AMERICA CLASS

LHA 6 | LHA 8 amphibious assault ship's (general purpose) mission is to operate offensively in a high-density, multi-threat environment and support the strategic agility, operational reach, and tactical flexibility required for successful amphibious operations and the rapid operational tempo required by the Marine air-ground task force (MAGTF). The LHA class is the central component of an amphibious ready group (ARG) or expeditionary strike group (ESG) and will be the sea base for an amphibious naval force capable of a wide range of operations. LHA class is capable of Short Take-Off Vertical Landing (STOVL), Tilt-rotor (TW) | Rotary Wing (RW) aircraft operations. USS America (LHA 6) and USS Tripoli (LHA 7) are optimized for aviation the only amphibious ships that do not contain a well deck to support surface vessels. LHA 8 (delivers in 2024) will feature a well deck to support use of Landing Craft Air Cushioned (LCAC), Landing Craft Utility (LCU) and other associated watercraft. (Amphibious Assault Ships LHA/LHD, 2016).

LHD WASP CLASS

LHD 1 Wasp amphibious assault ship (multi-purpose) class ships are capable of Short Take-Off Vertical Landing (STOVL), Tilt-rotor (TW) | Rotary Wing (RW) aircraft operations and well deck can embark, deploy, and land elements of an Landing Force (LF) in an assault by tiltrotor aircraft, helicopters, vertical/short take-off aircraft, landing craft (LCAC, LCU), amphibious assault vehicles (AAV) and combinations of these methods. (Amphibious Assault Ships LHA/LHD, 2016).

LPD SAN ANTONIO CLASS

The LPD 17 class amphibious transport dock mission is to operate offensively in a medium-density multi-threat environment as an integral member of an ESG. The LPD 17 class is not flag-configured. During amphibious assault operations, the ship can conduct near-simultaneous combined and coordinated air and surface-launched operations from over-the-horizon or close to the shoreline under restricted maneuvering conditions by coordinating landing and recovery of aircraft and landing craft. The San Antonio class has delivered nine of its twelve ships. LPD 27 and LPD 28 will deliver in FY17 and FY22 respectively.

LSD WHIDBEY ISLAND CLASS & LSD HARPERS FERRY CLASS

The LSD 41/49 class amphibious dock landing ship mission is to operate in a high density, multi-threat environment as an integral member of a joint task force, ARG/MEU, or ESG. LSD 41/49 class is not flag-configured and no unique facilities are provided for an embarked staff. During amphibious operations, the ship can operate from over the horizon or close to the shoreline in restricted waters to support sustained amphibious operations after the initial assault. The ships are capable of interfacing with both vertical and surface connectors to conduct simultaneous flight and wet well operations.

	LHA AMERICA CLASS	LHD WASP CLASS
SPEED (KNOTS)	22+ knots	22+ knots
CREW	1204	1285
EMBARKED LANDING FORCE	1687	1687
SURGE ACCOMMODATIONS	186	186
MEDICAL CAPABILITY	2 Operating Rooms, 24 Ward beds, 3 ICU beds, 699 overflow	6 OR, 18 ICU, 36 Wards, 6 Isolation Wards, 536 overflow
MASS CASUALTY	Non CRTS	Level II CRTS
POTABLE WATER	200K gallons/day	200K gallons/day
SURFACE INTERFACE POINTS	0	1
WELL DECK CAPACITY	No well deck	3 LCAC or 2 LCU
FLIGHT DECK	9 Spots (day/night IMC, landing with service and maintenance facility; VERTREP)	9 Spots (day/night IMC, landing with service and maintenance; VERTREP)
ELEVATOR (AIRCRAFT/CARGO)	Aircraft – two (75K tons each; 1 Starboard, 1 Port); Cargo - six (12K tons each)	Aircraft - two (75K tons each; 1 Starboard, 1 Port); Cargo - six (12K tons each)
HANGAR	25.9K sq ft, (two 7 frame high bays; 3.9K sq ft each)	20.4K sq ft (5 frame High Bay center; 2.8K sq ft)
RAMP	Pier side, Side Port	Pier side, Stern, Side Port
VEHICLE SQ FT (NET)	10.3K sq ft (63% BSF)	17.6K sq ft (63% BSF) includes 1.7K sq ft pre-boat
CARGO CUBE (NET)	160K cu ft (75% BSF)	125.2K cu ft (75% BSF)
LIFTING CAPACITY	Crash Crane (Tilly) 50K lbs	Crash Crane (Tilly) 50K lbs
CARGO FUEL	1.3 million gallons	LHD 1-4 (484K gallons); LHD 5-8 (617K gallons)
MOTOR GASOLINE	100 gallons	330 gallons
	LHA 6 USS America LHA 7 USS Tripoli (delivery FY 19)	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

S WARSHIPS



LPD SAN ANTONIO CLASS	LSD WHIDBEY ISLAND CLASS	LSD HARPERS FERRY CLASS
22+ knots	20+ knots	20+ knots
396 (+6 Transient)	404	420
699	403	406
101	99	101
2 OR, 22 Wards (6 ICU, 2 Isolation Wards)	1 OR, 1 ICU, 4 Wards, 2 Isolation Wards	1 ICU, 2 ISO
Level II CRTS	Non CRTS	Non CRTS
72K gallons/day	60K gallons/day (store 40K)	60K gallons/day (store 34.8K)
1	1	1
2 LCAC or 1 LCU	4 LCAC or 3 LCU	2 LCAC or 1 LCU
2 Spots (4 Expanded); day/night IMC, landing with service and maintenance; VERTREP	2 Spots (day/night IMC, landing with limited service; VERTREP)	2 Spots (day/night IMC, landing with limited service; VERTREP)
Cargo – two (12K and 16K); one lift platform (6K)	Cargo - 8K lbs	Cargo - two (12K and 8K lbs); 3 Lift Platforms (12K lbs each)
3.3K sq ft, (1 V-22 or CH-53) w/ 2.4K sq ft Crane	None	None
Stern, Side Port	Well-Deck Ramp	Well-Deck Ramp
20.8K sq ft (63% BSF) includes 1.2K sq ft pre-boat	11.6K sq ft (63% BSF) includes 2.3K sq ft pre-boat	16.3K sq ft (63% BSF) includes 1.2 sq ft pre-boat
35.9K cu ft (75% BSF)	4.9K cu ft (75% BSF)	49.7K cu ft (75% BSF)
Aviation 1.9K, 3.2K; Articulating Boom 11K, Bridge (Well Deck) 5K	60t Starboard; 20t Port; 15t Bridge (Well Deck)	Boat & Aircraft 30 ton 5 ton Aux
318.3K gallons	52.1K gallons	51.9K gallons
330 gallons	330 gallons	330 gallons
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 PCU John P Murtha (est FY16) LPD 27 PCU Portland (est FY17) LPD 28 Congressional add in FY15; delivers in 2022 *Note: LPD 28 reduces troops to LPD 16 ORD KPP 650 troops, no surge capability.*	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	LSD 49 USS Harpers Ferry LSD 50 USS Carter Hall LSD 51 USS Oak Hill LSD 52 USS Pearl Harbor

Note: Operational capabilities and embarkation capacities are derived from multiple sources and are available upon request from SID ESCB.

MARITIME PREPOSITIONING SHIPS

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. 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. The MPF provides Marine expeditionary forces the agility and capacity necessary to support and when necessary aggregate distributed forces to execute missions across the full range of military operations. The tenets of the MPF are **Global Coverage**, **Forward Presence**, and **Crisis Response**.

The MPF is inherently flexible to respond to a full spectrum of contingencies with effective power projection. Whether pier side, or at sea, MPF ships have unique capabilities to deliver rolling stock, tracked vehicles, ammunition, supplies, bulk fuel and water. In response to shifts in strategic vision, operational necessities, and budgetary realities we continue to evolve operational capabilities that go beyond the earlier logistics-centric focus aimed at mitigating the lack of strategic lift. The primary mission of rapidly closing a self-sustaining MEB-sized force with the organic capability of self-discharge within a degraded port or instream across a beach is still valid and remains a priority.

To meet the operational demands of geographic combatant commanders, implement service-level guidance, and align with emerging joint concepts of operation, we will continue to optimize Maritime Prepositioning Ships (MPS) to support efforts throughout the range of military operations. Increased optimization of MPS with enhanced capabilities and capacity will enable the GCC and operating force to use the MPF as a deployment and employment option capable of operating across the seabasing lines of operations providing them with viable and sustainable options.

The MPF program currently has 14 prepositioning ships, including six T-AKs, four LMSRs, two T-ESDs, and two T-AKEs. These ships are divided into two MPSRONs. MPSRON-2 is sited at Diego Garcia and MPSRON-3 is sited at Guam/Saipan. The new T-ESD's provide combatant commanders new seabasing-enabled capabilities for limited arrival and assembly at sea, and ship-to-ship and ship-to-shore transfer of personnel, equipment and supplies.

T-AK BOBO CLASS

The T-AK BOBO Class are container hauling, roll-on/roll-off (RO/RO) dry cargo ships that preposition equipment and supplies in strategic locations for rapid delivery ashore both pierside and instream. Navy lighterage carried onboard consist of causeway, both powered and unpowered, making it possible to discharge the MPSRON's equipment and supplies without the use of port facilities. The BOBO Class vessels were purpose built and are capable of producing 25,000 gallons of water per day and carry approximately 1.2 million gallons of JP5 fuel. Both fuel and water can be transferred ashore from a distance of 2 miles using the amphibious bulk liquid transfer systems (ABLTS) which is also prepositioned aboard each of these vessels. These ships are certified to land up to CH-53E helicopters.

T-AK SHUGHART CLASS

The T-AK USNS GYSGT Fred W. STOCKHAM is a converted large, medium speed RO/RO (LMSR) ship that strategically positions supplies for the U.S. Marine Corps. Unlike the BOBO Class, the USNS STOCKHAM has been modified to support dual use of storage space below deck for both containers and vehicles/equipment These ships also carry Navy lighterage and are capable of conducting RO/RO and or LO/LO operations both pier side and in stream. Additionally, like the Bob Hope and Watson class T-AKRs, STOCKHAM can moor skin-to-skin at sea with the T-ESD and conduct RO/RO operations through its side port to the T-ESD raised vehicle deck.

T-AKR BOB HOPE & T-AKR WATSON CLASS

The T-AKR, also known as the LMSR, is among the largest cargo ships in the world and can carry 350,000 to 390,000 sq ft of combat cargo (the equivalent of more than six football fields) at speeds up to 24 knots. These ships are capable of self-sustained RO/RO and LO/LO operations at a pier and also at sea via stern ramp to a RO/RO Discharge Facility (RRDF). In addition, the LMSR is capable of self-sustained LO/LO cargo operations in an MPF offload by interfacing with Lighterage. The T-AKR can moor skin-to-skin at sea with the T-ESD and conduct RO/RO operations through its side port to the T-ESD raised vehicle deck via the vehicle transfer ramp to LCACs for delivery ashore.

T-ESD MONTFORD POINT CLASS

The T-ESD, formerly known as the MLP, is designed to enhance throughput capability for the MPF, and serve as a transfer point within the seabase by facilitating delivery of vehicles, equipment, personnel and supplies from ship-to-ship, ship-to-shore and ship-to-restricted access locations ashore. The 25,000 sq ft mission deck provides limited at-sea marshalling capability by enabling limited reorganization, repositioning and/or breakdown of containerized cargo on the mission deck. By leveraging float-on/float-off (FLO/FLO) technology and a reconfigurable mission deck, the T-ESD functions as a seagoing pier when access to on-shore bases and support are unavailable. The T-ESD integrates landing craft, air cushion (LCAC) into offload operations via three LCAC lanes. The T-ESD is also capable of splashing AAV's from the LCAC lanes.

T-AKE LEWIS AND CLARK CLASS

LEWIS and CLARK class dry cargo/ammunition ships (T-AKE) are auxiliary support ships capable of prepositioning supplies in a manner that supports selective offload. Previously containerized Class II and VII equipment loaded in support of the CRFP is now loaded aboard the T-AKEs, enabling force stand-up without the need for large scale container operations. The T-AKE's are ready access sustainment supplies (ammunition, food, limited quantities of fuel, repair parts, ship store items, and expendable supplies and material) support resupply and sustainment of forces ashore. The T-AKEs are designed to be fully inter-operable with all US Navy and North Atlantic Treaty Organization (NATO) ships capable of underway replenishment, using standard US Navy Underway Replenishment (UNREP) equipment, or improved systems developed by industry. The T-AKE is equipped with a hanger and is MV-22 Osprey capable.



	T-AK BOBO CLASS	T-AK SHUGHART CLASS	T-AKR BOB HOPE CLASS
SPEED	17.7 knots	24 knots	24 knots
CREW	34 MSC, 10 MCMC	34 MSC, 10 MCMC	34 MSC, 10 Marine Corps Maintenance Contractors (MCMC)
EMBARKED LANDING FORCE	96	129	~125
MEDICAL CAPABILITY	Sick-call	Sick-call	Sick-call
FLIGHT DECK	1 Spot H53 (LVL II, CL 3/4) MV22: (LVL II, CL4)	1 Spot, H53 (LVL II, CL 2/4)	1 Spot H53 (LVL II, CL 3/4) MV-22: Lvl II, CL 4
AIRCRAFT PARKING	None	2 MH-60s Hangar	None
ORGANIC LIGHTERAGE	INLS: 3 CF, 1 WT (Williams RRDF vice CF)	INLS: RRDF, 1 WT	INLS: 3 CF, 1 WT
SURFACE INTERFACE POINTS	INLS, MPF UB, LCM-8, RRDF	INLS, MPF UB, LCM-8, T-ESD	INLS, MPF UB, LCM, T-ESD w/CCS
ELEVATORS (CARGO)	None	None	None
RAMP	Stern	Stern Ramp (Slewing) 79.5 short tons	Stern
SQUARE FEET (GROSS) unless occupied by TEUs	152,185 sq ft	304,313 sq ft	395,312 sq ft
CARGO/TEU CONTAINERS	546 TEU	1107 TEU, 950 w/ INLS	598 TEU or 427 w/INLS
LO/LO CAPABILITY	Five Cranes - 46.68 S/T each, Twin 87.36 S/T, Triple 131.04 S/T	Two sets: Single 63 Short Tons, & Twin 126.56 Short Tons	Two sets (Single - 63 Short Tons; Twin - 126.56 Short Tons)
POTABLE WATER	98,990 gal; 36K/day	160,320 gal; 19K/day	55,014 gal; 20.5K/day
CARGO FUEL (JP5)	1,430,000 gallons	46,533 gallons	0 gallons
OTHER INFORMATION	Carries the amphibious bulk liquid transfer system (ABLTS) that can send bulk fuel and water from the ship to the shore from a distance of 2 miles	Can moor skin-to-skin at sea with the T-ESD and conduct RO/RO operations through its side port to the T-ESD raised vehicle deck	Can moor skin-to-skin at sea with the T-ESD and conduct RO/RO operations through its side port to the T-ESD raised vehicle deck via the vehicle transfer ramp to LCACs for delivery ashore Capable of self-sustained LO/LO cargo operations in an MPF offload by interfacing with Lighterage
SHIP NAMES	T-AK 3008 USNS Bobo T-AK 3009 USNS Williams T-AK 3010 USNS Lopez T-AK 3011 USNS Lummus T-AK 3012 USNS Button	T-AK 3017 USNS Stockham	T-AKR 302 USNS Seay T-AKR 304 USNS Pililaau

SITIONING SHIPS



T-AKR WATSON CLASS	T-ESD MONTFORD POINT CLASS	T-AKE LEWIS & CLARK CLASS
24 knots	15 knots	20 knots
34 MSC, 10 MCMC	34 MSC	54 MSC, 10 MCMC
~125	0	~134
Sick-call	None	Sick-call
1 Spot H53 (LVL II, CL 3/4) MV-22: Lvl II, CL 4	1 Spot USCG - MOD EMERGENCY ONLY	1 Spot, H53 / MV22: (LVL I, CL 2/4)
None	None	2 MH-60S (Hangar - 2.5K sq ft, Crane 4K)
INLS: 2 CF, 1 WT	None	None
INLS, MPF UB, LCM, T-ESD	LCAC, (AAV Launch only)	None
None	None	Eight: (4) 8 ST; (4) 6 ST
Stern, Side-port	Side-port Vehicle Transfer Ramp	None
364,075 sq ft	25,000 sq ft (raised vehicle deck)	None
586 TEU	20 TEU double stacked	953,700 cu ft
Two sets (Single - 63 Short Tons; Twin - 126.56 Short Tons)	One 11 short ton crane (port)	Four Cranes 11 Short Tons
70,646 gal; 16.5K/day	100,000 gal; 25K/day	50,488 gal; 30K/day
0 gallons	380,000 gallons	1,048,000 gallons
Can moor skin-to-skin at sea with the T-ESD and conduct RO/RO operations through its side port to the T-ESD raised vehicle deck via the vehicle transfer ramp to LCACs for delivery ashore Capable of self-sustained LO/LO cargo operations in an MPF offload by interfacing with Lighterage	Functions as a seagoing pier when access to on-shore bases and support are unavailable. Launch/recovery of LCAC, launch of AAV (no recovery). S&T Program: Advanced Mooring System Experimentation: Displacement craft interface, AAV recovery	Largest cargo-carrying capacity and the largest flight deck of any combat logistics ship afloat
T-AKR 311 USNS Sisler T-AKR 312 USNS Dahl	T-ESD 1 USNS Montford Point T-ESD 2 USNS John Glenn	T-AKE 1 USNS Lewis and Clark T-AKE 2 USNS Sacagawea

Note: The information presented in these charts represents Seabasing Integration Division baseline information derived from current Ship Loading Characteristics Pamphlets, Program Office, and ICODES, etc. References available upon request.

MSC SUPPORT SHIPS

While most active ships in MSC's prepositioning fleet strategically place military supplies and equipment at sea, there are Navy Fleet Support, Expeditionary Support, and Auxiliary ships that are in service (e.g. LCC, EPF) or activated from reduced operating status (ROS) when needed to support the Navy-Marine Corps team. These in-active ROS ships include two aviation logistics (T-AVB) ships (SS Curtiss and SS Wright) that provide at-sea intermediate maintenance activities for fixed- and rotary-wing aircraft; and two hospital (T-AH) ships (USNS Mercy and USNS Comfort). The hospital ships each contain 12 operating rooms and up to 1,000 beds. Each of these ships are in ROS but when called into action can be underway in five days with an expanded crew of more than 60 Civilian Mariners (CIVMARs) and up to 1,200 medical personnel.

LCC BLUE RIDGE CLASS

The LCC is an amphibious command ship that can fulfill command and control requirements for surface, subsurface, and air units engaged in amphibious operations. The LCC's mission is to be the command ship for an amphibious task force (ATF) or the C4I platform for a joint task force. This is the only class of ship designed from its hull up to support the command and control needs of the ATF, landing force commanders, and the tactical air control center (TACC).

T-EPF SPEARHEAD CLASS

The Expeditionary Fast Transport (T-EPF), formerly known as the JHSV, provides critical intra-theater, shallow-draft capability to enable the joint force commander to project forces and sustainment at high speeds over operational distances. The T-EPF can self-deploy to a theater of operations and, once in theater, provide high-speed transport to move personnel, equipment and supplies within that theater. Specifically, the T-EPF can deliver combat ready assault forces, weapons systems, equipment, and supplies over the intra-theater ranges to shallow, austere, or degraded ports. Ahead of the fleet introduction Joint High Speed Vessel 1, Spearhead, SID collaborated with the Military Sealift Command (MSC) Headquarters, and the JHSV program office to produce the JHSV Planning Guide. Since its release in Jan 2014, there have been a number of JHSV/EPF deployments, missions, and lessons identified. These are being captured in a new version of the EPF Planning Guide that is forecast for release by the end of FY-16. The JHSV Planning Guide can be found at the Seabasing SharePoint site under the Connectors & Doctrine Branch tab.

T-AVB WRIGHT CLASS

USMC aviation currently employs two dedicated Aviation Logistics Support Ships (T-AVBs). The ships provide dedicated sealift for the rapid movement of Marine Aviation Logistics Squadron mobile facilities to sustain fixed and rotary-wing aircraft. This capability is available enroute, pier-side, or seabased (afloat), providing selective offload, seabase enabled expeditionary logistics support to the MAGTF. The T-AVB also provides strategic lift in a Lift-On/Lift-Off (LO/LO) or Roll-On/Roll-Off (RO/RO) conventional container configuration, and supports MEB level operations in a variety of both doctrinal and non-traditional roles. The expeditionary aviation logistics capabilities found in the T-AVB vessel may be augmented with ground logistics maintenance to enhance support for peacetime distributed laydown, Phase 0 and 1 Theater Security Cooperation (TSC) missions, and across the Range of Military Operations (ROMO).

T-AH HOSPITAL SHIP MERCY CLASS

T-AH hospital ships are owned and operated by MSC. They provide emergency, on-site care for forces deployed in war or other operations as well as full hospital services to support U.S. disaster relief and humanitarian operations worldwide. Each hospital ship contains 12 fully equipped operating rooms, a 1,000 bed hospital facility, digital radiological services, a medical laboratory, a pharmacy, an optometry lab, a CAT-scan, and two oxygen producing plants. Each is equipped with a flight deck capable of landing large military helicopters, and also have side ports to receive patients at sea. The ships are kept in ROS but can be fully activated and crewed within five days.

T-ESB PULLER CLASS

The Expeditionary Mobile Base (T-ESB), formerly known as the AFSB, is a variant of the T-ESD and is the first purpose-built T-ESB vessel for the Navy. The Ponce, formally LPD 15, was repurposed as an interim (I) AFSB in 2012. Based on the hull of an Alaska class crude oil tanker, the T-ESB is optimized for airborne mine countermeasures (AMCM) with potential to support SOF and USMC expeditionary operations. This ship has enhanced aviation spaces and accommodations for 150 embarked personnel. Born from a long-standing request from CENTCOM, the T-ESB is an affordable and effective option to deploy forces for low-intensity operations without reducing the availability of amphibious warships required for other missions. A third T-ESB has been funded for a projected FY20 delivery. Concept development for employment of SPMAGTFs and other USMC force packages are ongoing.

	LCC BLUE RIDGE CLASS	T-EPF SPEARHEAD CLASS
SPEED (KNOTS)	23 knots	35 knots in SS3
RANGE		1200 nm (at 50% fuel) / 4700 nm (at 95% fuel, minimal cargo)
CREW	774	26 CIVMARS
EMBARKED LANDING FORCE	209	312/4 days or 104/14 days
MEDICAL CAPABILITY	The embarked force will have access to the ship's medical spaces for conducting sick call and treating patients with augmentation of an Independent Duty Corpsman (IDC)	The embarked force will have access to the ship's medical spaces for conducting sick call and treating patients with augmentation of an Independent Duty Corpsman (IDC)
POTABLE WATER		
FLIGHT DECK	1 Spot (day/night IMC, landing area with service; VERTREP)	Class 2 (Landing/Take-off) UH-1N/Y; AH-1W/Z; H-6; H-58; H-46; H-60 A/G/K/L/S/B/F/H/R/M; AH-64D; MH-53E, CH-53E/K Class 4, Special Type 2 (VERTREP) H-46; H-47; H-60 A/G/K/L/S/B/F/H/R; MH-53E, CH-53E/K; MV-22 ; MV-22 can only VERTREP
AIRCRAFT PARKING		1 Spot for H-60 (folded)
RAMP		Slewing Stern Ramp capable of holding M1A2 tank
VEHICLE SQ FT (NET)		
CARGO/TEU CONTAINERS	2,175 cu ft	20,300 sq ft (cargo or vehicles)
LIFTING CAPACITY		600 ST (includes crew/stores, embarked forces, aviation & ship's fuel)
CARGO FUEL	123K gallons	
	LCC 19 USS Blue Ridge LCC 20 USS Mount Whitney	T-EPF 1 USNS Spearhead T-EPF 2 USNS Choctaw County T-EPF 3 USNS Millinocket T-EPF 4 USNS Fall River T-EPF 5 USNS Trenton T-EPF 6 USNS Brunswick T-EPF 7 Carson City (delivery est 2016) T-EPF 8 Yuma (delivery est June 2016) T-EPF 9 Bismark (delivery est 2017) T-EPF 10 Burlington (delivery est 2018) T-EPF 11 TBD (delivery est 2019) T-EPF 12 TBD (delivery est 2020)

ORT SHIPS



T-AVB WRIGHT CLASS	T-AH HOSPITAL SHIP MERCY CLASS	T-ESB LEWIS B. PULLER CLASS
18 knots (80% power)	17.5 knots	15 knots
41 MSC	65 with 1215 medical personnel (max)	34 MSC, 101 MILCREW
Berths: Military stateroom capacity: 25/ Troop berthing capacity: 300		Berths: 150 Embarked Troops
Exam room with 6 Ward beds	12 OR, 100 ICU, 1,000 Ward beds Care Beds: Post Surgery/Recovery (20), Intermediate (400), Minimal Care (500) Mass Casualty: Level III	The embarked force will have access to the ship's medical spaces for conducting sick call and treating patients with augmentation of an Independent Duty Corpsman (IDC)
	300,000 gal/day	115K gallons
1 Spot (day/night VMC, landing area without support facility; VERTREP)	1 Spot (day/night Ops with IMC, landing area without support facility)	2 Expanded Spots (day/night IMC, landing area with service and maintenance) (H53). Pending 4x V22 operating spot modifications/ certifications.
		1 spread or 2 stowed MH-53 (in Hangar)
Stern Ramp (125K lbs); Side Port Ramp (13 ft width		
23.1K sq ft (UV – 6.5K sq ft; LV – 7.3K sq ft; MV – 9.3K sq ft)		
Transport – 688 (8'x8'x20'); Operational – 300 w/52 access modules		20 TEU & Mission Deck Cargo 65K sq ft
Ten Boom Cranes (30 tons); Equalizing Bar (60 tons); One Lifting Boom (70 tons)	Crash Crane (50K lbs; lift/roll 25 ft outreach)	One 12.5 S/T boat crane (midship); One 11 S/T crane (port-aft flight deck)
		350K gallons
T-AVB 3 SS Wright T-AVB 4 SS Curtiss	T-AH 19 USNS Mercy T-AH 20 USNS Comfort	T-ESB 3 USNS Lewis B. Puller T-ESB 4 USNS Hershel "Woody" Williams T-ESB 5 TBD

Note: The information presented in these charts represents Seabasing Integration Division baselined information, derived from current Ship Loading Characteristics Pamphlets, Program Office, and ICODES, etc. References are available upon request.

CONNECTORS

Connectors are arguably the most critical capability in and supporting the sea base. The *MV-22 Osprey*, CH-*53 Super Stallion, UH-1Y Huey, Landing Craft Air Cushion (LCAC), Landing Craft Utility (LCU), Expeditionary Fast Transport (T-EPF, formerly known as JHSV), Improved Navy Lighterage System (INLS)* and the *Lighter, Amphibious Resupply, Cargo-V (LARC-V),* among others, combine to ensure the key functions of preparing for movement, littoral maneuver, and force projection can be effectively executed from the sea base.

Connectors transport personnel, equipment and supplies within the amphibious operations area; they enable maneuver. With the modernization of our vertical connectors, MV-22 and the CH-53E, and the future CH-53K model, there is a growing, nearly revolutionary leap in the operational reach capability in the MAGTF. Further, the Navy is in the process of modernizing the surface connector fleet by replacing the Landing Craft Utility (LCU) and the Landing Craft Air Cushion (LCAC) which will provide higher-payload capacities at longer ranges, and more intense environmental conditions for surface maneuver.

The term “Connector” was coined in the Seabasing Joint Integrating Concept (JIC), published by the Vice Chairman of the Joint Chiefs of Staff in 2005, and it has served well to inform science and technology and amphibious and expeditionary maneuver capabilities development since that time. The JIC characterizes the surface and vertical lift platform capabilities that are critical components either organic to, or in support of, the sea base to transport personnel, supplies, and equipment within the sea base and maneuver them from the sea base to objectives ashore.

Maintaining the combined capabilities of the Navy’s fleet of landing craft, both non-displacement and displacement, along with the intra-theater range of the T-EPF are essential to realizing the operational attributes and flexibility of the future sea base.

LANDING CRAFT AIR CUSHION (LCAC)

The LCAC is a high-speed, non-displacement, fully amphibious craft. Its ability to ride on a cushion of air allows it to operate directly from the well decks of amphibious warfare ships and to access more than 70 percent of the world's beaches, compared to 17 percent for displacement landing craft. A service life extension program (SLEP) began in late 2000 for the 72 active LCACs and provides major refurbishment to extend LCAC craft service life to 30 years. The LCAC 100 class craft being produced in the Ship-to-Shore Connector (SSC) program will be a one-to-one replacement for the in-service LCACs and the LCAC (SLEP) as these craft reach the end of their service lives.

LANDING CRAFT UTILITY (LCU)

The LCU, the displacement craft component of the Navy's landing craft fleet, complements the LCAC by transporting the heaviest loads of equipment and supplies ashore while providing the ability to operate independently in support of intra-theater transport, security cooperation, non-combatant evacuation, foreign humanitarian assistance, and disaster relief operations. LCUs have both bow and stern ramps for onload/offload and are capable of conducting independent open ocean transits or operations at sea for up to 10 days. The 45+ year old LCU fleet will be replaced one-for-one by the LCU 1700 program.

LIGHTER, AMPHIBIOUS RESUPPLY, CARGO-V (LARC-V)

The LARC-V SLEP is an amphibious vehicle used by the beach party in surf zone salvage, recovery, dewatering, casualty evacuation, C2 roles, ramp checks, and occasionally for the transportation of personnel and equipment. LARC-V SLEP are currently the only Beach Master Unit assets available for hole checks, a method used to determine the best/safest offload point for displacement craft. In general, each ARG or ATF deploys with at least one LARC-V SLEP, and often two. The Navy is currently assessing LARC-V replacement options via the Amphibious Surf Capable Vehicle (ASCV) program.

IMPROVED NAVY LIGHTERAGE SYSTEM (INLS)

The INLS is comprised of powered and non-powered barge-like platforms/modules that reconnect to form the Causeway Ferries (CFs) designed to transfer cargo from MPF's and MSC's ships to the shore when port facilities are damaged, inadequate, or not available. The RO/RO Discharge Facility (RRDF) made up of 9 non-powered causeway sections provides the at-sea interface capability between the MPS and the CF to conduct in-stream offloads of vehicles and equipment. CFs can also enter the well decks of amphibious warfare ships to provide additional options to support ship-to-shore movement.

MPF UTILITY BOAT

The Maritime Prepositioning Force Utility Boat (MPF UB) is designed for personnel, supplies, and light equipment transfers between MPS for the conduct of MPF offload operations. Additionally, the MPF UB can provide water-borne force protection as well as limited movement of injured personnel or casualties evacuation support in a protected environment. Personnel can embark or debark using its forward ramp, or over-the-side via a low pier or quay wall. Payload is five short tons, including up to 30 personnel with 150 pounds of equipment at up to 25 knots fully loaded.

MV-22B OSPREY

The MV-22B joins T-EPF, CH-53, and LCAC as the seabasing connectors that enhance our ability to execute over-the-horizon expeditionary maneuver warfare. Specific missions for the MV-22B include expeditionary assault from land or sea, medium-lift assault support, aerial delivery, tactical recovery of aircraft and personnel, air evacuation, and rapid insertion and extraction. The V-22 is a multi-mission aircraft designed for use by the Marine Corps, U.S. Navy, and U.S. Air Force.

CH-53E/K

The CH-53 is a heavy lift helicopter designed to transport heavy equipment and supplies during the ship-to-shore movement of an amphibious assault and during subsequent operations ashore. The CH-53K new build copter is the only helicopter that can lift 100% of the USMC equipment designed for vertical lift from amphibious shipping to inland objectives under high altitude and hot atmospheric conditions. The aircraft will be capable of externally transporting 27,000 lbs, to a radius of action (ROA) of 110 NM in support of amphibious operations, and is the only heavy lift helicopter currently being developed within DoD.

UH-1Y HUEY

The UH-1Y is a multi-purpose utility helicopter that can be used in the sea base as a ship-to-ship or ship-to-objective vertical connector capable of transporting personnel, equipment, and supplies. With its increased speed and lift capacity, the UH-1Y gives the MAGTF a significantly increased maneuver, C2, and logistics capability.

CONNECTORS




	LCAC	LCU	LARC-V	INLS
SPEED	35 knots	10 knots	8-9 knots	10 knots
RANGE	116 nautical miles	1200 nautical miles	40 nautical miles	243 nautical miles
TROOP CAPACITY	24	400 (passengers only)	20	Varies based on load
CARGO CAPACITY/ PAYLOAD	60/72 overload/short tons	137 short tons	5 short tons	280 short tons
NOTES	Range is based on payload of 74.5 tons in an operational environment of 80 degrees F, 35-knot speed of advance, 1 ft. significant wave height, and 8-knot winds. (Safe Engineering & Operations (SEAOPS) Manual - LCAC (SLEP) Program)	Cargo capacity reflects LCU technical warrant holder recommended maximum deck cargo load due to the service life/increased light ship weight of LCU. The LCU-1700 class will increase cargo capacity to 170 short tons/restore 2 M1A1 load.	None	Range is based on 50% payload at 9 knots.




	MPF UB	MV-22	CH-53E	UH-1Y
SPEED	38-42 knots	262 knots	150 knots	145 knots (cruise), 179 knots (max)
RANGE	300 nautical miles	325 nautical miles, Self-deployment Range 2100 nm	540 nautical miles	129 nautical miles w/ 2.2k lbs payload
TROOP CAPACITY	30 combat troops	24 combat troops	32 troops	8 troops
CARGO CAPACITY/ PAYLOAD	5 short tons	*External* 10K lbs single (175nm) /15K lbs dual (25 nm) / 6K lbs (at range) *Internal* 20K lbs cargo (25nm)/ 12K lbs cargo (at range), 12 litters	*External* 6.8K lbs (110nm) ROA; cargo hook rated to 36K lbs *Internal* : 6.2K lbs (110nm); 24 litters	*External* 3.1K lbs *Internal* 6.6K lbs, 6 litters
NOTES	None	None	None	None

SCIENCE & TECHNOLOGY

Seabasing science & technology (S&T) efforts are designed to continuously improve our ability to operate in varying environmental conditions and sea states. Our goal is to optimize efficiencies through inter-operability thereby improving MAGTF maneuver, distribution, and throughput.

Technological superiority is a cornerstone of our national military strategy. In peacetime, technological superiority is a key element of deterrence. In crisis, it provides a wide spectrum of options to the Nation, while providing confidence to allies. In war, it enhances combat effectiveness, reduces casualties, and minimizes equipment loss -- it provides the edge. Advancing military technology and rapidly transitioning it to the warfighter are now national security obligations of ever-greater importance. New technologies, coupled with new operating concepts, provide ever greater degrees of selective access and retrieval of equipment and supplies.

Since its approval in 2005, no concept has been the focus of more analysis and discussion than the Seabasing Joint Integrating Concept (JIC). Driving the need for seabasing is the increasingly difficult problem of operational access for our military forces -- not only of an adversary seeking to deny access to an operating area but also of reluctant allies struggling to balance domestic sensitivities and priorities with their regional security obligations. For Marines operating in this environment, seabasing provides GCCs and the MAGTFs the capabilities needed for engagement, crisis response, and power projection across the range of military operations.

Advanced Mooring System

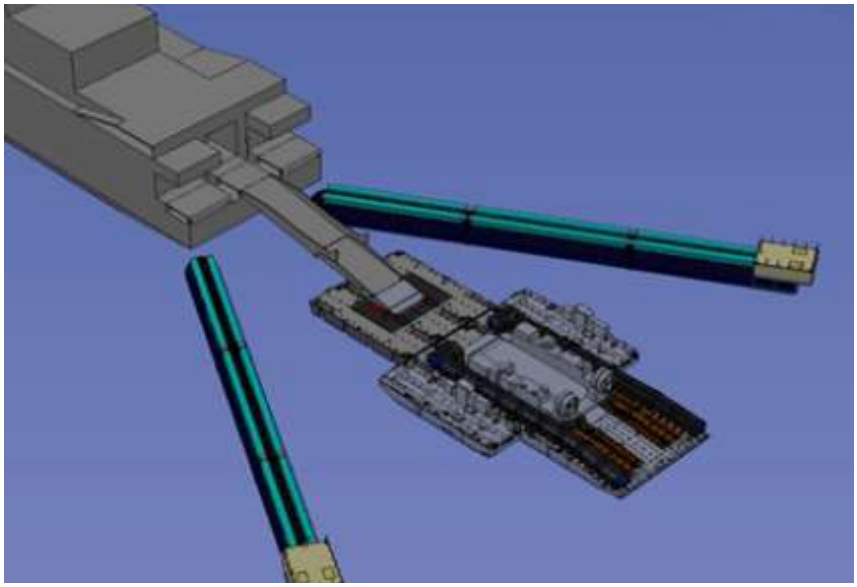
One of the most difficult challenges facing forces conducting sea-based operations is the need to bring ships, vessels, craft, and lighterage together to facilitate the transfer of personnel, equipment, and cargo from one platform to another in less than ideal weather conditions. AMS enables frequent, safe, and fast mooring at sea with minimal manpower (no line handling). When installed on the T-ESD or other ships, it will facilitate their use as an open-ocean hub for transfer of equipment, supplies, mission packages, and personnel. AMS will complete its S&T phase in FY16. No transition or procurement path has been identified.

Environmental Ship Motion Forecasting

The ESMF is a tool that forecasts wave motion and ship motion response. The tool will help ship captains, masters, and their deck crews determine whether it is prudent and safe to conduct ship-to-ship transfer of people, equipment, and cargo. It extends the operational environment for various missions by predicting time periods or ship headings where cargo movement may be conducted despite sea states normally considered beyond safe operating limits. Conversely, it would predict unsafe operating conditions in sufficient time to take action to amend or suspend operations. ESMF's ability to predict ship motions will significantly increase the safety of operations between two vessels conducting cargo transfer at sea. ONR will complete the ESMF S&T phase during 2016 and is finalizing the transition to PEO Ships for continued development and testing.

Large Vessel Interface LO/LO

Large Vessel Interface Lift On/Lift Off (LVI LO/LO) is an advanced, motion-compensated, at-sea cargo transfer system enabling transfer of fully-loaded cargo containers between ships and vessels in up to SS4. The fully developed technology gives the warfighter the ability to move containerized logistics through the sea base without having to secure a deep water port for container ship off-loading. This capability greatly increases the sea base's potential throughput capacity and provides a key logistical enabler for the GCC to support joint task force operations ashore. LVI LO/LO completed its S&T phase in 2011. Technology has been completed and will inform future MPF recapitalizations.



Flexible Sea-based Force Projection

The FSFP is a unique and simple concept for reducing local sea states in lieu of developing potentially expensive engineering solutions to overcome adverse operating conditions. Inflatable, fillable rigid structures deploy as a wave barrier in and around ships, vessels, craft, and platforms that reduces sea states from SS4 to SS3 or from SS3 to SS1-2, thereby better enabling cargo transfer operations, surface connector interfaces, and amphibious vehicle launch and recovery. The FSFP uses inflatable structure technologies to enable launch and recovery of amphibious vehicles from a wide range of sea -based platforms. This system will interface with existing sea base components to support surface vessel transfer operations. The development of FSFP was to start in FY17, but was cancelled due to funding constraints.

Ultra Heavy-Lift Amphibious Connector (UHAC)

The UHAC is a displacement craft designed with buoyancy and propulsion systems enabled by innovative common articulated cell technology. A full scale UHAC would have the same well deck footprint as a SSC and at 20 knots up to three times the payload of the SSC. It would also be approximately the same payload as a 1600-series LCU but twice as fast. The captive air cell technology also yields a low ground pressure footprint (less than two psi), and would give it the ability to traverse mud flats or climb over obstacles in excess of 10 feet. With a projected range of over 200 miles, UHAC could deliver forces and sustainment from well over the horizon. Future surface connectors with UHAC's speed, payload, range, and ability to operate to and through a beach would give GCC and MAGTF commanders a significant time-distance advantage in projecting forces ashore. UHAC is an ONR initiative. A 4/10th scale demonstrator has been designed, built, and tested.

T-ESD Displacement Craft RDT&E

The T-ESD provides capability to transfer vehicles and personnel from an LMSR and offload them via LCACs for transit to shore. Providing the capability to transfer vehicles to displacement landing craft would vastly increase the utility and options for T-ESD employment. OPNAV N95 funded PMS385 to conduct studies and execute tests to demonstrate the feasibility of the T-ESD to interface with and transfer vehicles to and from the LCU displacement landing craft and the INLS causeway ferry if feasible. These demonstrations establish the feasibility of enhancing the T-ESD's surface interface capability with displacement landing craft. After developing an Interface Platform (IP) from INLS modules, and a ramp to facilitate the transfer of vehicles from T-ESD to IP, the capability was successfully tested during October 2015. Further tests are scheduled for 2016, with an eventual goal of maturing capabilities and procedures for inclusion in future exercises. With future experimentation, the ideal goal is to achieve direct craft interface without the requirement of an enabling platform.


LVI LO/LO

JOINT CAPABILITY TECHNOLOGY DEMONSTRATION (JCTD)

The Joint Capability Technology Demonstration (JCTD) Program directly addresses DoD, multi-Service and GCC priorities through partnering and cost sharing with solution providers and resource sponsors. The JCTDs provide key partnerships with the Department of Defense, the Services, and other government agencies, select allies, and industry that allow for expedited development, deployment, and evaluation of capability solutions with the potential to close validated warfighting capability gaps. The JCTD program typically demonstrates solutions within two to four years and has a transition rate to the warfighter of greater than 80 percent.

Dense Pack Access, Retrieval and Transit (DPART)

The DPART JCTD is an effort co-sponsored by PACOM and TRANSCOM with the Marine Corps as the lead service. DPART JCTD officially commenced in August 2013 and is currently scheduled to transition to the General Services Administration after completion. The JCTD will deliver one hybrid powered Container-Lift and Maneuver System (C-LMS), one battery powered Autonomous Naval Transport-Large Wheeled Vehicle (ANT-LWV), and two Universal Remote Controls (URC) to operate both systems. C-LMS is designed to lift and Omni-directionally maneuver 20-foot ISO Containers in confined spaces not accessible by traditional material handling equipment (MHE), whereas the ANT-LWV is designed to lift and omni-directionally maneuver the MTVR family of vehicles. This technology has the potential to significantly enhance current MHE capabilities in dense pack environments aboard sea lift vessels, the seabase, and lighters/connectors. Furthermore, the DPART JCTD team has recognized additional applicability for DPART technology during shore-based operations; from maintenance depots to container handling and port facilities, DPART's unique maneuverability will be able to improve efficiency and add value.

A diesel powered interim C-LMS prototype executed a Limited Operational Utility Assessment (LOUA) in March 2015, where an Independent Assessor recommended the continuance of technology development, issue resolution, and assessment planning in order to fully evaluate the capabilities and concepts of the hybrid powered deliverable. Further assessment events of the diesel powered interim C-LMS prototype and URC will be executed in July and August 2016.

AFLOAT COMMAND AND CONTROL, COMMUNICATIONS, AND COMPUTERS (C4)

To be successful in maritime and amphibious operations across the range of military operations (ROMO), GCCs and forward-deployed forces require sea-based platforms and connectors. However, just as essential to their success are naval and joint Afloat Command, Control, Communications, and Computers (C4) capabilities. These afloat C4 systems at the most basic level are about information: receiving it, judging its value, processing it into useful forms, acting on it, and sharing it with others. C4 systems enable our GCCs and MAGTFs to make the most of the information they have.

Critical C4 capabilities include high throughput (bandwidth) communications that are especially relevant to independent, disaggregated, and special operations. The minimum thresholds required will enable individual platforms to operate as single ship deployers, synchronize effects in a joint-environment, leverage reach-back support, exploit ISR products, and perform basic logistics and administrative functions.

Afloat networks continue to degrade and become obsolete much faster than they are being upgraded or refreshed. Recently deployed ARG/MEUs have reported that their degraded shipboard networks significantly impact operations, to include multiple levels of Command and Control (C2), specifically, the Common Operational Picture/Common Tactical Picture situational awareness; Intelligence, Surveillance and Reconnaissance (ISR) receipt and dissemination, and embarked Navy and Marine Corps elements.

Mitigating the challenges of command and control of afloat forces is crucial to the success of our nation, GCCs, and Navy and Marine Corps. Recent history of deployed forces strongly indicates that the new, non-traditional norm will be ARG/ATF ships operating independently from the MEU or the MEB as single ship deployers or for special operations. Hence, MAGTF afloat C4 capabilities must support this new norm to ensure a viable C4 environment across a wide variety of operating requirements.

The different uses, configurations, and concepts over the ROMO, as well as their continuing evolution, require a naval and joint C4ISR architecture that is sufficiently adaptable and interoperable to meet the highly variable and changing needs that we will be called on to meet, especially including those operations with Coalition and Allied forces. For example, recent operations have shown that the ability to acquire mobile targets and deliver timely fires may depend on the integration of C4ISR capabilities that are supplied by other military forces or other Federal Agencies (NRO, Intelligence Agencies, U.S. Air Force and Special Operations Forces).

These and other naval and joint capabilities are being transformed through new operating concepts and systems collected under the construct of “network-centric warfare” which applies the integrating power of modern information technology to naval operations.

AMC4RC Letter. Since 1992, the Marine Corps has published afloat C4 requirements in various formats. The most recent is the 2015 MAGTF Command and Control, Communication, and Computers (C4) Required Capabilities (AMC4RC) letter. The AMC4RC Letter lists the Marine Corps C4I required capabilities to support maritime and amphibious operations. It articulates afloat MAGTF C4 gaps, capabilities, and services required rom an operational perspective across the full ROMO. It identifies C4 budget priorities as they relate to amphibious ships, MPF ships, and Expeditionary Fast Transport (EPF). It is intended to inform Navy and Marine Corps programming efforts during near-term POM funding cycles.

Specifically, the AMC4RC includes 1) prioritized list for direct near-term POM development for USMC and MPF platforms, 2) capabilities required to support USMC war-fighting functions, 3) required services with detailed technical specifications to facilitate integrated materiel solutions, 4) network connections and telephony requirements by vessel class and space, and 5) afloat baseline that lists systems required aboard designated class ships to conduct operations and assigned missions. The letter is prepared annually by the Seabasing Integration Division on behalf of the Deputy Commandant for Combat Development & Integration.

Afloat Networks. Afloat network capabilities directly impact warfighting functions and all facets of Command and Control (C2) for both Navy and Marine Corps embarked elements and therefore should operate and support the same functions and capacities as the ashore network environment. Consolidated Afloat Networks and Enterprise Network Services (CANES), is the U.S. Navy's next generation tactical afloat network, representing the consolidation and enhancement of multiple shipboard legacy networks and programs. CANES provides a common computing environment for more than 40 command, control, intelligence and logistics applications. Some of the improvements include network upgrades, enterprise services (chat, e-mail, internet, and video), increased network security, and virtualization of the USMC afloat network environment.

SATCOM (Satellite Communications). Warfighters increasingly rely on satellite connectivity for command and control and to coordinate Beyond-Line-of-Sight (BLOS) operations. New requirements such as full motion video (FMV) from unmanned platforms can stress overburdened systems. New generations of high-capacity SATCOM systems allow seabased warfighters to share information and intelligence quickly and efficiently.

MILSAT (Military Satellite). MILSAT communications is the primary secure means for over-the-horizon and beyond line of sight support to strategic, operational, and tactical level warfighting capabilities. The Navy Multiband Terminal (NMT) is the next generation protected Military SATCOM system which will ensure secure, protected, command, control and communications capabilities and will support the exchange of tactical data, imagery, real-time video, battlefield maps and targeting information. NMT will provide critical, high-throughput (bandwidth) communications that are especially relevant to independent, disaggregated, and special operations.

COMSAT (Commercial Satellite). COMSAT communications provide redundancy, survivability, and surge support to the forward deployed forces. Commercial satellite systems are not required to be protected and provide flexibility in coverage and cost for service throughput augmentation to MILSAT. The Commercial Broadband Satellite Program (CBSP) and INMARSAT systems provide this capability. CBSP throughput for individual ships varies depending on the amount of commercial bandwidth that is leased and the amount of allocated bandwidth. MPF and MSC platforms rely almost exclusively on this capability for connectivity between platforms and shored based facilities.

Both the NMT and CBSP are designed to allow ships to transmit voice, video and data faster and at greater volume. The programs are a successful application of the Navy's satellite communications strategy because by consolidating these efforts, the military can leverage emerging technology at reduced costs.

HF-SAR (High Frequency - Shipboard Automatic Link Establishment Radio). HF-SAR is used for non-satellite, over-the-horizon voice and data communications to request air support, control maneuver, perform reconnaissance, coordinate fires and effects, and coordinate logistics during the advanced force and assault phases of an amphibious operation. HF-SAR is the only voice and data, single-system over-the-horizon capability in a satellite communication (SATCOM) denied or congested environment.

EMUT (Enhanced Manpack Ultra-High Frequency (UHF) Terminal). EMUT supports voice and data satellite communications from the MAGTF afloat C2 spaces (Landing Force Operations Center (LFOC), Tactical Logistics (TACLOG), etc.) to static and on-the-move maneuver (mounted and dismounted) forces ashore. It is the only dedicated afloat Landing Force SATCOM.

Iridium Antenna and Infrastructure Installation. Iridium Antenna and infrastructure installation will enable the embarked landing force to transmit and receive Iridium phone calls and send or receive limited data directly from inside the Troop Operations compartment and/or LFOC. Iridium telephone provides an independent capability separate from the existing ship telephone system and networks. It provides communications in the event of shipboard power, telephone, network, or satellite outages. This provides dedicated, reliable access to commercial telephone, Defense Switch Network (DSN) and secure voice communications while maintaining situational awareness from operational spaces.

Blue Force Tracker—2 (BFT-2)/Joint Battle Command—Platform (JBC-P). BFT-2/JBC-P is a digital, information family of systems that provides integrated, on the-move, timely, relevant Command and Control/ Situational Awareness (C2/SA) information to tactical combat, combat support and combat service support commanders, leaders, and key C2 nodes. JBC-P provides MAGTF Commanders a capability for selecting, managing, and assimilating relevant data and information. The ability to pass orders and graphics provide the joint warfighter the capability to visualize the commander's intent and scheme of maneuver. BFT-2/JBC-P enables Warfighters to share a common operating picture of the battlefield and allows Warfighters to exchange Position Location Information (PLI) and tracks, graphic overlays, tactical chat, and to gain access to terrain maps, logistics information and other data securely. Most importantly, BFT-2/JBC-P provides a joint, shared Situational Awareness (SA) display indicating the identification, location and movement of friendly and enemy units.

Landing Force Terrestrial Communications. Landing Force Terrestrial Communications provide non-satellite dependent, high throughput Line-of-Sight (LOS) and Beyond-Line-of-Sight (BLOS) means of command and control. This capability is especially critical in Anti-Access, Area-Denial (A2AD) environments. Terrestrial communications enable collaborative planning, ISR/FMV distribution and secure voice, video and data within the battle group. Terrestrial communications need to be maintained and upgraded to enhance C4ISR capabilities across the ARG/ATF, increase joint interoperability, and reduce traffic loads on shipboard SATCOM systems.

Cyberspace and Electromagnetic Spectrum Operations. Future military operations will require freedom of action in cyberspace and the Electromagnetic Spectrum (EMS). This will include defense and protection for the MAGTF Commander's use of the cyber and physical domains while exploiting, denying or even attacking the enemy's spaces and resources. Adversaries will seek to gain cyberspace superiority by exploiting, disrupting and sometimes creating physical destruction via the cyber domain. By making use of relatively inexpensive, game-changing technologies, they will stage operations in cyberspace that could have significant impacts to include physical domain operations and warfighting support. MAGTF commanders will use the cyber domain as battle space defending, maneuvering, contesting and even attacking known and unknown cyber adversaries. Commanders of the future will need to fight the "Spectrum and Network" when it is infiltrated or denied. The Cyberspace and Electronic Warfare Coordination Cell (CEWCC) will be the Marine Corps initial capability implementation afloat. The MAGTF commander uses the CEWCC to ensure organic and non-organic cyberspace and EMS-dependent capabilities are planned, executed, and assessed during all phases of an operation; and are incorporated into the MAGTF's operational design, CONOPS, scheme of maneuver, concept of fires support, intelligence operations.

Joint Strike Fighter and Unmanned Aerial Vehicle Information Exploitation. The F-35B and UAVs provide great potential for increased capability within the MAGTF and the Joint Force, but only if it is appropriately integrated. To meet the MAGTF requirement for enhanced C2 while embarked afloat, and exploit the improved capability of the F-35B and the UAVs, we must improve the capability of the amphibious force to send, receive, and distribute C2 and Intelligence, Surveillance and Reconnaissance data. This includes shipboard integration of weapons coordination / control and status reporting with remote land, air, surface, and subsurface units. The future roles of unmanned platforms are predicted to expand into strike and logistics areas of operation and will also need to be integrated into the afloat environment. Five areas of improvement for amphibious platform are necessary for F-35B digital interoperability: Link 16, Variable Message Format, ISR Full-Motion Video/Still Imager Photography, combat systems and C4 cross-domain data exchange, and network and communications capacity. UAS operations will require an expanding role on amphibious platforms to launch/recover, execute missions, control and operate payloads and weapons, and receive and distribute UAV ISR data.

SEABASING CAPABILITY OBJECTIVES

The Deputy Commandant for Combat Development and Integration (DC, CD&I) is the Marine Corps Seabasing Advocate. As such, DC, CD&I identifies seabasing required capabilities, deficiencies, issues, and solutions and advances them through various HQMC, Department of the Navy, Joint Staff and Department of Defense processes.

DC, CD&I chartered the Seabasing Operational Advisory Group (SOAG) to solicit input from the operating forces on seabasing capabilities, gaps, solutions and the integration of emerging concepts and capabilities. The SOAG is managed by SID and meets quarterly to consistently and deliberately develop and deliver the most effective seabasing solutions. In delivering this Seabasing Report, SID sought out and solicited operational input from various activities and forums. The outcomes and lessons learned from testing, modeling, analysis, demonstrations, war games, exercises, and operations are collated and presented here as the Seabasing Capabilities Section and are necessary to enhance the afloat MAGTF's capabilities and capacities.

INPUTS.

Seabasing's capabilities are derived from analytic assessments of past, present and future operations, exercises, Joint/Service level tasks and concepts, and a wide range of Navy and Marine Corps operational advisory groups and warfare improvement programs.

- Expeditionary Force 21
- Marine Corps Operating Concepts
- Marine Corps Capability Based Assessment
- Seabasing Operational Advisory Group
- MEU Operational Advisory Group
- Science and Technology Operational Advisory Group
- Prepositioning Operational Advisory Group
- Maritime Working Group
- Expeditionary Warfare Improvement Program
- Amphibious Warfare Improvement Program
- Expeditionary Warrior Title 10 Wargame
- Service Directed Exercises and Wargames
- Auxiliary Platforms and Payloads Council
- Adaptive Force Packaging Guidance

SEABASING RELATED GAPS FROM POM 18 MCEIP.

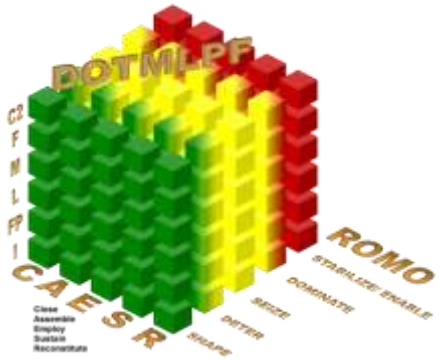
Each year the Marine Corps conducts an enterprise wide capability based assessment and publishes a Marine Corps Enterprise Integration Plan (MCEIP). The MCEIP is designed to inform capability development and investment to ensure we get the best Marine Corps we can afford. Gaps in seabasing capabilities are identified through the analysis lessons learned, after action reports, needs statements, modeling and simulation, and war gaming.

Solutions for seabasing gaps are developed using DOTMLPF (Doctrine, Organization, Training, Materiel, Leadership, Personnel, and Facilities) framework. Proposed solutions are introduced for investment consideration into the annual POM planning cycle of the Navy and Marine Corps.

SOLUTION DEVELOPMENT.

Gaps are examined through multiple seabasing-related factors such as the seabasing lines of operations (Close, Assemble, Employ, Sustain, Reconstitute - CAESR), warfighting functions (C2, ISR, Fires, Maneuver, Logistics, Force Protection, Cyber), and across the range of military operations (ROMO).

- Surface Assault during Amphibious Maneuver
- Ship to Shore Connectors
- Amphibious Force Sufficiency and Strategic Lift
- MPF Selective On-load
- PACOM ARG/MEU
- Seabasing Experimentation
- Seabasing Force Preparation
- MEU UAV/UUV ISR
- C2 aboard Non-traditional Naval Platforms
- AAV at Sea Recovery
- Opposed Surface VBSS
- NSFS for MAGTF Operations
- Engage Direct Fire Targets during Amphibious Operations
- Proof Assault Lanes/Craft Landing Zones during Amphibious Operations
- Spatial & Situational Awareness during Amphibious Operations



FIVE SEABASING CAPABILITIES DEVELOPMENT FACTORS.

Each seabasing capability is grounded in five Seabasing Capability Development Factors: Marine Corps Tasks, Navy Tasks, Warfighting Functions, Seabasing Lines of Operations, and Joint Capability Areas. These Seabasing Capability Development Factors are essential in ensuring the development and delivery of the right capability for mission accomplishment.

- Marine Corps Tasks
- Navy Tasks
- Warfighting Functions
- Seabasing Lines of Operations
- Joint Capability Areas

LHD 1/LHA 6 Class MMP Assault & Aviation Systems Integration

CURRENT STATUS USS Essex (LHD 2) is scheduled to complete the first Mid-Life (ML) availability in FY17. Other 7 LHD 1 class complete ML by FY24.

BACKGROUND. LHD 1/LHA 6 Class Maintenance and Modernization Periods (MMP) consist of three phased shipyard periods (Pre-Mid-Life (ML), ML and Post-ML) over the 40 year expected service life. MMPs are critical to sustaining the ship and the amphibious force in general. Integrated plans identify maintenance burdens, engineer cost effective solutions, and provide prioritized warfare capability improvements. Modernization efforts will include aviation and assault systems integration and Command, Control, Communications, Computers, Combat systems and Intelligence (C5I) systems necessary for expeditionary operations. Projected integration plans to support Marine Corps aviation, specifically Joint Strike Fighter (F-35B) and Osprey (MV-22), are the Cornerstone and External Environment (EE) ship alterations. Changes to pace current and future threats include the ship self-defense system (SSDS) MK2 upgrades and Link 16 installation. Several communications and network upgrades (i.e. CANES) are planned over each period.

CAPABILITY OBJECTIVE. The LHD 1 class (8) and LHA 6 class (2) ships are capable of meeting global forward presence, power projection, and crisis response requirements. These ships provide significant heavy lift capacity, aviation facilities, and command and control. LHD 1 class ships can operate both displacement and non-displacement surface connectors and can conduct simultaneous vertical and surface connector operations. LHA 6 class optimizes the enhanced aviation capabilities of the future Aviation Combat Element (ACE) with an enlarged hangar deck, aviation maintenance facilities and increased aviation fuel capacity providing a warfighting dimension not previously available to the Joint Force Commander. Both the LHD 1 and LHA 6 class ships can deploy independently aggregated or disaggregated as part of the Amphibious Ready Group (ARG), and Amphibious Task Force (ATF) in support of Special Purpose Marine Air-Ground Task Forces (SPMAGTF), Marine Expeditionary Unit (MEU), and Marine Expeditionary Brigade (MEB) amphibious operations. The MAGTF's ability to execute the full spectrum of military operations is dependent on enhancements gained through these modernization periods.

IMPACT. MMP completion is critical for sustaining a modern expeditionary force and providing a qualitative edge over an opponent. Eleven big decks will be delivered by FY24 meeting the requirements for the Assault Echelon (AE). LHD 1 and LHA 6 classes provide the largest amphibious capacity to operate, project air power, and provide surface connectors combined with an embarkation capacity that offers significant heavy lift capability to support COCOM requirements in support of validated OPLANS, CONPLANS, and Theater Engagement Plans.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.1 Conduct Amphibious Ops
1.12.5 Conduct Seabasing Ops
1.3.3.3.1 Conduct Aviation Operations from Expeditionary Sea-based Sites

UNIVERSAL NAVAL TASK LIST (UNTL)

Conduct Amphibious Ops
Conduct Ship-to-Shore or Ship-to-Objective Maneuver

WARFIGHTING FUNCTIONS

Command & Control
Fires
Maneuver
Logistics

SEABASING LINES OF OPERATION

Close
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

2 Battlespace Awareness
3.1 Force Application, Maneuver to Engage, Insert, Influence, (Maritime)
4.1 Logistics, Deployment & Distribution, Move the Force, Sustain the Force
5 Command and Control

LHA 8: LHA(R) Flight 1

CURRENT STATUS LHA 8 is currently in competitive source selection as part of an amphibious and auxiliary shipbuilding acquisition strategy. Long lead item material procurement and detailed design is scheduled to begin in FY17, procurement is funded in FY17 and FY16 and delivery is planned for FY24. Early industry involvement starting in FY15 provided over 300 cost reduction initiatives that were developed by industry, Navy and the Marine Corps. These affordability cost reduction initiatives drove technical and production improvements throughout the ship design culmination in the ship specification issued to industry for more affordable ship design and construction.

BACKGROUND. LHA 8 is a modified repeat of the LHA 6, which restores the well deck with capacity for two landing craft air cushion (LCAC). An additional feature is the reduced island which increases the aviation capacity of the flight deck while retaining the enhanced aviation support capabilities of LHA 6. LHA 8 will provide a functional replacement for the aging LHD 1 WASP Class ships which begin to retire in FY29. This technologically advanced amphibious ship will be capable of providing forward presence and power projection as an integral part of joint, interagency, and multinational maritime expeditionary forces while exploiting 5th generation aviation assets like the Joint Strike Fighter.

CAPABILITY OBJECTIVES. The Marine Corps requires an Amphibious Assault Ship with multiple surface connector interface capability which was removed in LHA 6 and LHA 7. The first LHA 8 is scheduled to deliver in FY24 achieving the minimum requirement of 11 big decks (three LHA, eight LHD). These ships must be capable of meeting global forward presence, power projection, and crisis response requirements. LHA 8 restores the capability to conduct simultaneous vertical and surface connector operations enabling independent, aggregate and disaggregated ARG, and ATF operations in support of SPMAGTF, MEU, and MEB, amphibious operations. The MAGTFs operational capability and embarkation capacity to execute the full spectrum of future military operations is dependent on a force sufficient to support emerging global operational requirements in the littorals and a surface interface for armored vehicle that cannot be transported by air operations.

IMPACT. LHA 8 is critical to sustain the attributes of a future expeditionary force. The evolution of the LHA design is necessary to leverage technology associated with a modern force and preserve a qualitative edge over opponents and integrate 5th generation aviation, fires, mobility and logistics. Sustained new construction of the LHA 8 every four years, as LHD 1 class ships retire will ensure a sufficient force is operationally available to support the COCOM requirements. Reduced numbers of Amphibious Assault Ships would negatively impact our ability to carry out National Defense Strategies. The new LHA 8 design will provide the operational flexibility to conduct simultaneous vertical and surface employment of the MEU and MEB Assault Echelon in support of validated Operational Plans (OPLANS), Contingency Plans (CONPLANS), and Theater Engagement Plans.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.1 Conduct Amphibious Ops
1.12.5 Conduct Seabasing Ops
1.3.3.3.1 Conduct Aviation Operations from Expeditionary Sea-based Sites

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2 Conduct Amphibious Ops
1.5.2.1 Conduct Ship-to-Shore or Ship-to-Objective Maneuver

WARFIGHTING FUNCTIONS

Command & Control
Fires
Maneuver
Intelligence
Logistics

SEABASING LINES OF OPERATION

Close
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

2 Battlespace Awareness
3.1 Force Application, Maneuver to Engage, Insert, Influence, (Maritime)
3.2 Engagement
4.1 Logistics, Deployment & Distribution, Move the Force, Sustain the Force
5 Command and Control

LX(R) Amphibious Ship Replacement Program

CURRENT STATUS The Consolidated Appropriations Act of 2016 added funding for the acceleration of LX(R). The program focus during FY16 will be the validation of the LX(R) Capability Development Document and executing LX(R) contract design efforts with lead ship procurement in FY20, the Navy will initiate key long lead time material procurements critical to maintaining a stable supplier base, and accelerate design activities in order to begin lead ship construction in FY21, and lead ship delivery in FY25.

BACKGROUND. LX(R) is the replacement program for the landing ship dock, LSD 41 and LSD 49 classes, which will begin reaching their estimated service life in FY27. LX(R) is envisioned to be a flexible, multi-mission warship with capabilities that support execution of the full range of military operations. The need to support disaggregated or split operations away from the Amphibious Ready Group or to deploy independently is a key driver for the design of the LX(R) ship class. LX(R) will leverage the mature design of the LPD-17 hull form while balancing cost and requirements to deliver key capabilities.

CAPABILITY OBJECTIVES. The capabilities inherent in the LPD 17 derivative hull-form provide LX(R) the required operational capabilities and embarkation capacities necessary to conduct operations in an increasingly complex environment. As a 25,000 ton hull form, LX(R) will possess greater troop, flight deck/aviation capacity, and fuel, medical, and C2 capabilities than the smaller 16,000 ton LSD 41/49 class ships. The increased hull size will accommodate future changes to afloat MAGTF operational requirements and capabilities. Operational risk was assessed and deemed acceptable in reducing LCAC capacity from four LCAC spots (LSD 41 class) to two LCAC spots in order to increase overall capability and capacity in other key areas. Balanced capabilities and capacities will enable LX(R) to operate across a broader range of military operations, while supporting operational objectives for independent, ARG/MEU, and ATF/MEB mission profiles. Substantial increases in aviation capabilities (operational and maintenance) offset the reduction in landing craft capacity, resulting in an equitable balance between ship aviation and surface interface capabilities. 11 LX(R) amphibious warships, with a 40 year service life are required to replace 12 LSD 41/49 class ships that decommission from FY27 to FY38.

IMPACT. LX(R) is critical to sustain the attributes of a future expeditionary force. Sustained delivery of LX(R) as LSD 41/49 class ships retire will provide a sufficient force that is operationally available to support COCOM requirements. The new LX(R) design will provide the operational flexibility to conduct simultaneous vertical and surface employment of the MEU and MEB Assault Echelon in support of validated Operational Plans (OPLANS), Contingency Plans (CONPLANS), and Theater Engagement Plans. Additionally, LX(R) will provide an Independent operational capability in support of urgent COCOM requirements. Failure to fully fund or execute LX(R) will impact the Marine Corps ability to maximize forward presence and crisis response.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.1 Conduct Amphibious Ops
1.12.5 Conduct Seabasing Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2. Conduct Amphibious Ops
1.5.2.1 Conduct Ship-to-Shore or Ship-to-Objective Maneuver

WARFIGHTING FUNCTIONS

Command & Control
Maneuver
Logistics

SEABASING LINES OF OPERATION

Close
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

3.1 Force Application, Maneuver to Engage, Insert, Influence, (Maritime)
4.1 Logistics, Deployment & Distribution, Move the Force, Sustain the Force

MPS and Auxiliary Platform Modernization

CURRENT STATUS. The objective of MPS and auxiliary platform modernization is to ensure our platforms remain relevant over their service lives as strategies, methods of deployment/employment, and requirements/capabilities evolve by planning and programming appropriate modernization priorities for legacy ships in a manner that answers near and mid-term demands while informing eventual new ship builds (recapitalization). Currently planned and funded upgrades include aviation modifications for the MPF T-AKEs (expanded hangar door to enable MV-22 spotting, crane modification, etc.), beginning with USNS Sacagawea in FY17 and possibly USNS Lewis and Clark in FY19. Feasibility of expanded MV-22 operating spots for the T-AKEs is also being considered by NAVAIR. Efforts are underway to expedite, if possible, MV-22 flight deck certification for the Bob Hope Class LMSRs. Throughout the current MPF Maintenance Cycle (MMC-11), MPS loads have been reconfigured to accommodate the CFRP concept. This will continue to evolve as the CRFP and other AFP concepts evolve. In addition, ADHOC AFP(s) within the SPMAGTF construct are continuing to be deployed globally in support of theater engagement plans. These AFP(s) are also conducting integrated exercise experimentation, concept testing and validation. Information that is derived from these events is coalesced and fed into the capabilities and requirements Force Development process. To date, USMC Service leads have coordinated AFP development efforts with resource sponsors and program managers through a formally established Auxiliary Platforms and Payloads Council (APPC), which reports progress to the Naval Board.

BACKGROUND. In addition to the AFP initiative, the APPC, co-chaired by OPNAV N42/95 and fully engaged by Blue-Green representation, has been developing similar near-mid- and far-term solutions. Findings have shown that, currently, MPS and auxiliary platforms can only support theater security cooperation (TSC), mil-to-mil, and other low-end ROMO mission profiles. In order to improve the operational feasibility and utility of MPS and auxiliary platforms to meet the increased operational requirement, as directed, incremental ship enhancements must be planned and programmed.

CAPABILITY OBJECTIVES. Near-term presents significant challenges in ship allocation, tasking, modification planning, funding and execution, so AFP(s) must adjust to "Today's" platform capabilities. Mid-term execution requires near-term analysis and planning for platform operational capability development and programming incremental capability development. Far-term planning enables the shaping of ship recapitalization for sustainable AFP employment.

Per the recently submitted response to SECNAV request for AFP update, the following near-mid-far-term objectives are among options being considered:

<u>Near-term</u>

USNS Sacagawea aviation upgrades FY17 $3M (N42) / USNS Lewis and Clark in FY19.

Bob Hope Class T-AKR MV-22 Flight deck certification. Potential DI USNS Pililaau FY16 (N42 for action).

MPS Surface Connector CBA (Recapitalization) from LCM-8 to enhance ship to shore employment of adaptive force packages.

T-AKE MV-22 expanded spot flight deck (pending NAVAIR analysis, funding and modifications).

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.3 Conduct Prepo Ops
1.12.5 Conduct Seabasing Ops
4.1.2.4 Conduct Distribution Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2.2.3 Buildup the Force

WARFIGHTING FUNCTIONS

Maneuver
Logistics

SEABASING LINES OF OPERATION

Close
Assemble
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

4.1.1 Logistics, Deployment & Distribution, Move the Force
4.1.2 Logistics, Deployment & Distribution, Sustain the Force

MPS and Auxiliary Platform Modernization

Mid-term

Bob Hope Class T-AKR 1-2 spot MV-22 land/launch capability.
MPS surface connector solution.
Expanded berthing aboard auxiliary platforms
Full interface of INLS, LCU-1600/1700, AAV with T-ESD.
Employment of USMC Force packages from the T-ESB.

Far-term

Motion Compensating Cranes
MPS recapitalization with increased embarkation capacity and operational capabilities that support the MCO mission while maintaining the ability to execute AFPs.

IMPACT. Answers SECNAV and Service-level guidance, as well as GCC near and mid-term operational requirements. Moreover, this effort will achieve enhanced operational relevance for the service life of current MPS and inform the long term recapitalization with a thorough (Naval Integrated) analytical (S&T, RDT&E, modeling) foundation.

In addition to the above objectives, SID, CDD has initiated several studies that will impact current and future modernization/recapitalization initiatives. Analytical data, modeling results, and feasibility conclusions may result in additions to the near and mid-term objectives, and will certainly influence overall recapitalization of MPS. The studies include:

Prepositioning Capabilities Based Assessment (CBA). Jan 2012 EOS directed a look at ashore/afloat-CONUS/OCONUS prepositioning; 3-Phase approach. Phase I is complete and phase II is complete awaiting final approval of resulting gaps and a *USMC Prepositioning Vision 2017-Beyond*. Phase III, a fully Naval Integration effort with OPNAV participation, will begin sometime in 2016.

MPF Deployment Study (modeling development effort). To provide MPF USMC/USN operational planners notional timelines for the pier-side, in-stream, and at-sea offloads of a MPSRON. Significant changes in the MPF program and platforms have made older planning timelines no longer relevant. Enhancements to MPF now afford greater capabilities for over-the-horizon operations and persistent sustainment. The results of this study will accurately inform GCCs, planners and Navy and Marine Corps units of realistic MPSRON offload timelines which could significantly impact standing OPLANs, ROC/POE, doctrine and unit manning and training. Initial models are complete and SID is currently planning follow-on study/development and scenarios to run which will inform all modernization and recapitalization efforts.

MPF Force Sufficiency Study. Establishes sustained modeling that will allow thorough analysis of MPF capabilities, facilitating examination of gaps in force sufficiency, operational capability, and embarkation capacity. This forward looking analysis will focus on the cumulative effects that simultaneous demand for forces and MPF modernization will have on readiness and operational availability in the near-term in order to consider mitigation strategies for training and ship inventory shortfalls.

T-AKE Engineering Feasibility Study.

Evaluating the feasibility, structural impacts and rough order magnitude (ROM) costs associated with potential T-AKE modifications. The two MPF T-AKEs are experiencing increased operationalization in order to support GCC theater engagement requirements that cannot be fulfilled by other naval vessels. The study is evaluating the capabilities to stow, deploy and recover the INLS, serve as ABLTS platform, stow, deploy and recover the MPF Utility Boat, and stow Class VII rolling stock (USMC vehicles) in below deck cargo holds. This study has the added benefit of addressing a MARFORPAC Deliberate Universal Needs Statement (D-UNS) (2014) seeking an organic surface connector for the T-AKE. These modifications, along with the currently funded aviation capability expansion (hangar door enlargement, V-22 spotting expansion, etc.), have the potential to greatly increase the operational capabilities of the MPF T-AKEs.

Expeditionary Fast Transport (T-EPF)

CURRENT STATUS T-EPF is a fully funded program to build 12 EPFs; six have been delivered.

BACKGROUND. The T-EPF, formerly known as the JHSV, bridges the gap between low-speed sea lift and high speed airlift by transporting personnel, equipment, and supplies over intra-theater distances with access to littoral offload points including austere, minor and degraded ports.

CAPABILITY OBJECTIVES. The T-EPF is a non-combatant, and is designed to operate in permissive environments. Key capabilities* are (1) Transport 600 short tons of cargo, combat-loaded vehicles, and supplies for 1200 nautical miles at 35 knots, (2) Off-load pier side in austere environments without reliance on shore infrastructure or to a roll off/roll-on discharge facility (RRDF) in sea state (SS)1, (3) 20,000 ft² mission bay/cargo space to support a combat-loaded M1A2 tank, (4) 312 airline seats and 104 permanent berths for embarked troops, (5) Launch/recover small boats (11 meter RHIBs) with its organic 20-ton crane, and (6) Flight deck accommodates H-60, H-1, and H-53 aircraft operations. It can also accommodate vertical replenishment (VERTREP) – including with the MV-22.

IMPACT. The T-EPF enables rapid closure of forces to the sea base from advanced and intermediate bases, maneuver of combat ready forces in acceptable threat environments to in-theater austere or degraded ports, and at-sea logistics movement from APF and MPS. T-EPF can be used to support theater security cooperation, HA/DR, non-combatant evacuation, and other missions.

**Note: Payload weight includes crew, embarked personnel, cargo, vehicles, equipment, aviation and ship's fuel. The 'iron-triangle' effect applies, i.e., as cargo increases, speed and/or range decrease.*

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.5 Conduct Seabasing Ops
4.1.2.4 Conduct Distribution Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2.2.3 Buildup the Force

WARFIGHTING FUNCTIONS

Maneuver
Logistics

SEABASING LINES OF OPERATION

Close
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

3.1 Force Application, Maneuver to Engage, Insert, Influence, (Maritime)
4.1 Logistics, Deployment & Distribution, Move the Force, Sustain the Force

Amphibious Vehicle Launch Capability

CURRENT STATUS

EPF . ONR's Interface Ramp Technology demonstrator successfully completed motion testing. It is in storage at Aberdeen Test Center, MD. NAVSEA and the EPF builder completed an initial assessment of the current ramp capability and found that modifications will be needed for the ramp and the ship depending on the weight of the vehicles, e.g., tank will drive more significant changes to both. A Phase 2 is pending which will examine what ramp changes might be needed to accommodate at-sea launch of AV.

LCAC. Navy Surface Warfare Center-Panama City Div. (NSWC-PCD) has designed, and is fabricating, a ramp restraint to better accommodate AAV at-sea launch. It will be installed to enable testing this summer. The final report will be completed this FY. Results may inform Engineering Change Proposals (ECP) for future LCAC 100 and LCU-1700 class craft.

BACKGROUND. In the summer of 2013, per USMC's request, NAVSEA conducted a quick-look examination of potential ramp modifications to determine the technical feasibility of launching AAVs from JHSV. Three options were identified: 1) design a stand-alone platform to be placed under the ramp foot using the crane, 2) design and attach a buoyancy apparatus to the foot of the ramp, or 3) design removable ramp that could be installed while at sea. In 2014 NAVSEA then partnered with the EPF shipbuilder, Austal USA ,to conduct a detailed examination of the ramp (designed for 0.1m SWH) in order to determine it's true sea state limitations for at-sea transfers alongside the ESD.

The USMC decision to cancel the EFV program developing a high water speed, over-the-horizon self-deploying amphibious vehicle prompted a re-examination of the LCAC aft ramp as well. The purpose of this effort began in 2014 was/is to improve its ability to launch AAVs the procedures for which were published in the LCAC Safe Engineering And Operations (SEAOPS) manual in the late 1980s. Navy Surface Warfare Center Panama City Division's mandate was to identify potential engineering change proposals for the ramp to improve the launch capability of the AAV and examine a potential ACV launch (using a Marine Personnel Carrier [MPC] as a surrogate ACV. NSWC-PCD has completed an analysis of alternatives and designed an aft ramp restraint device that will keep the ramp stable during the launch procedure.

CAPABILITY OBJECTIVES. The AAV will remain the Marine Corps' surface amphibious assault platform for the MAGTF through 2035. With the increased stand-off distances associated with near-peer A2/AD capabilities, landing craft and EPF provide a potential opportunity to complement and enhance our ability to project the leading elements of the surface assault from over-the-horizon to a line-of-departure commensurate with the swim range of the AAV, and perhaps the ACV. As such, we will continue to work with the Navy to pursue this capability.

IMPACT. These initiatives are being carried out so as not to disrupt the current POR/ build plan for EPF, LCAC-100., and LCU-1700. The ability to conduct at-sea launch of AAV has been included as an additional performance attribute (APA) in the LCU-1700 CDD.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.1 Conduct Amphibious Ops
1.12.5 Conduct Seabasing Ops
4.1.2.4 Conduct Distribution Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2 Conduct Amphibious Ops
1.5.2.1 Conduct Ship-to-Shore or Ship-to-Objective Maneuver
1.5.2.2.3 Buildup the Force

WARFIGHTING FUNCTIONS

Maneuver

SEABASING LINES OF OPERATION

Close
Assemble
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

3.1 Force Application, Maneuver to Insert, Influence, (Maritime)

LCAC (SLEP) & Sustainment

CURRENT STATUS 72 craft were planned to undergo SLEP from the original 91 produced. However, with the recently funded Post-SLEP Extensions (PSE) that will add 5 to 7 more years of SL, it was determined to be more economically sound to extend a SLEP rather than conduct a full SLEP on all 72 craft. Combined, the LCAC SLEP and PSE are intended to maintain the 72 craft inventory required while the LCAC-100 class craft achieve full operational capability (FOC) in 2027.

BACKGROUND. The LCAC Service Life Extension Program (SLEP), which began in 2000 and is planned to be completed in this year (FY16), is designed to extend the service life of LCAC from 20-30 years. Coupled with the LCAC post-SLEP extension (PSE) sustainment effort, SLEP helps minimize the non-displacement landing craft quantity gap while the LCAC-100 class craft, produced in the Ship-to-Shore Connector (SSC) program, is introduced into the fleet.

CAPABILITY OBJECTIVES. Fully fund LCAC (SLEP), LCAC Fleet Maintenance Program (FMP), and LCAC (PSE) to minimize pending craft gap. The SLEP program is designed to upgrade engines and refurbish rotating machinery for more power along with the outfitting of a deep skirt to reduce maintenance and increase performance and replacement/upgrade of C4N equipment.

IMPACT. A non-displacement landing craft gap will have a negative impact on our ability to conduct amphibious operations. LCAC (SLEP), the Fleet Maintenance Program (FMP), and PSE are all critical to maintain the fleet inventory/minimize gaps in LCAC service life as LCAC-100s enter service. LCAC (SLEP) and sustainment has been in the top 10 of the Amphibious Warfare Warfighter Improvement Program (AMW WIP) Integrated Prioritized Capability Lists (IPCL) for the past five years (2012-2016).

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.1 Conduct Amphibious Ops
1.12.5 Conduct Seabasing Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2 Conduct Amphibious Ops
1.5.2.1 Conduct Ship-to-Shore or Ship-to-Objective Maneuver

WARFIGHTING FUNCTIONS

Maneuver
Logistics

SEABASING LINES OF OPERATION

Close
Employ
Sustain

JOINT CAPABILITY AREA (JCA)

3.1 Force Application, Maneuver to Engage, Insert, Influence, (Maritime)
4.1 Logistics, Deployment & Distribution, Move the Force, Sustain the Force

LCAC-100 (Ship-to-Shore Connector [SSC] Program)

CURRENT STATUS LCAC 100 & 101 are under construction with planned deliveries in 2017. PB17 contains two LCAC-100; an additional three have been proposed in PB17 (Pre-Decisional). A sole source contract has been awarded to Textron for FY17 with options for six LCAC-100 in FY18 and 12 in FY19. Initial Operating Capability (IOC-6 craft) and Full Operating Capability (FOC-72 craft) are planned for 2020 and 2027 respectively.

BACKGROUND. The SSC program of record will produce the LCAC-100 class non-displacement landing craft to replace the current fleet of legacy LCAC and LCAC (SLEP). The LCAC-100 will provide more powerful engines, increased reliability, advanced navigation and engineering control systems, and more payload capacity to maneuver troops and equipment from ships to over-the-shore within the littorals. SSC has been in the top 10 of the Amphibious Warfare Warfighter Improvement Program (AMW WIP) Integrated Prioritized Capability Lists (IPCL) for the past five years (2012-2016).

CAPABILITY OBJECTIVES. A ship to over-the-shore non-displacement landing craft with increased payload and reliability beyond the legacy LCAC and LCAC (SLEP) is required to support MAGTF maneuver in the littorals. The LCAC-100's capabilities include: (1) 74 ton payload capacity to carry an M1A1 tank with track width mine plow, (2) operational environment of a significant wave height of 4.1 feet with an ambient temp of 100 degrees F, (3) main cargo (level) deck ~50 feet x 24 feet wide, strengthened to accommodate heavier footprints (mobile loaded MTVRs) outboard of center-line, and (4) increased automation/human-system interfaces to allow for a pilot/copilot cockpit configuration.

IMPACT. Full funding is critical to minimize the gap in the Required Operational Capability/Projected Operational Environment (ROC/POE) quantity of 72 craft needed for surface ship-to-over-the-shore and over-the-horizon littoral maneuver as legacy LCAC are retired when reaching the end of planned extended service life.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.1 Conduct Amphibious Ops
1.12.5 Conduct Seabasing Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2 Conduct Amphibious Ops
1.5.2.1 Conduct Ship-to-Shore or Ship-to-Objective Maneuver

WARFIGHTING FUNCTIONS

Maneuver
Logistics

SEABASING LINES OF OPERATION

Close
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

3.1 Force Application, Maneuver to Insert, Influence, (Maritime)
4.1 Logistics, Deployment & Distribution, Move the Force, Sustain the Force

LCU Sustainment & Recapitalization

CURRENT STATUS. With the LCU 1610 class averaging more than 45 years of service, the ongoing sustainment program is critical to retain the ROC/POE inventory at 32 craft. The LCU-1700 CDD was approved December 2015 and preliminary design contracts were awarded in May 2016. Request for proposals are expected to be released in Sept 2016 with source selection in March 2017. Initial Operating Capability (2 craft) and FOC (32 craft) are forecast for 2022 and 2028, respectively.

BACKGROUND. The LCU 1600 class landing craft provides the heavy payload capacity and independent operations capability necessary to ensure surface movement and crisis response requirements can be met across the ROMO. These craft were built for a service life of 25 years; however, the fleet age currently averages over 45 years. Maintenance and equipment obsolescence are increasing the challenges associated with the LCU sustainment program while the class continues to experience a high demand signal.

CAPABILITY OBJECTIVES. A heavy lift displacement craft to maintain the necessary balanced landing craft fleet required for surface movement and maneuver in the littorals. The LCU-1700 program (formerly SC(X)) will recapitalize the LCU 1610 class capabilities that provide for:

- Simultaneous transport of personnel and cargo of up to 400 passengers without modification,
- Persistence (10 day/1,200 nautical miles), forward staging, small boat platform, dive support, surveillance (LCAC limited to 12 hours, well deck required),
- Operations in confined or debris-congested waterways; surf salvage; Theater Security Cooperation (TSC), building partnerships, and
- Logistics-over-the-shore operations via interface with RRDF, INLS, and Army Modular Causeway System (MCS).

Moreover, the LCU-1700 program is critical to restore a two M1A1 tank payload and the ability to provide intra-theater/shore-to-shore maneuver of up to 170 short tons of vehicles, equipment, and sustainment. The current ROC/POE quantity of 32 is consistent with the high demand stemming from its flexibility and value for ARG/MEU and independent amphibious warship deployments. LCU sustainment and LCU-1700 were prioritized in the top 10 on the AMW WIP IPCL in 2012-2016.

IMPACT. The LCU Sustainment and LCU-1700 programs require full funding to retain the heavy lift and flexible displacement craft capability needed to fulfill amphibious and expeditionary operational requirements.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.1 Conduct Amphibious Ops
1.12.5 Conduct Seabasing Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2 Conduct Amphibious Ops
1.5.2.1 Conduct Ship-to-Shore or Ship-to-Objective Maneuver

WARFIGHTING FUNCTIONS

Maneuver
Logistics

SEABASING LINES OF OPERATION

Close
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

3.1 Force Application, Maneuver to Engage, Insert, Influence, (Maritime)
4.1 Logistics, Deployment & Distribution, Move the Force, Sustain the Force

Lighter, Amphibious Resupply, Cargo (LARC)-V

CURRENT STATUS The aging LARC-V inventory, built over 45 years ago has undergone a SLEP (LARC-V A1/A2) that included new engines and drive trains, improved tow bits and pad eyes, replacement deck hatches and re-configured stowage areas. LARC inventory: 10 support MPF, 28 are in support of the ARG/MEU deployments, and 4 support Underwater Construction Teams. The Navy initiated an Amphibious Surf Capability Vehicle (ACAT IV) program in 2015 to recapitalize the LARC capability. The Initial Capability Document (ICD) was approved in March 2016, and an Analysis of Alternatives (AoA) Study Plan is currently being routed through OPNAV for approval.

BACKGROUND. The LARC-V (5-ton) is a single crew, four-wheeled, self-propelled amphibian, powered by a diesel engine. Its general mission is to provide the Beach Party Team (BPT) with the capabilities to salvage disabled landing craft (including raising ramps, towing, and dewatering) and transport personnel and cargo between the beach and afloat landing craft. It is also used to determine the best/safest beach access/offload point for the LCU. Each BPT is equipped with two LARC-V.

CAPABILITY OBJECTIVES. The LARC capability requirements include: surf and beach zone salvage, boat lane preparation, landing craft ramp checks, surf zone rescue, recovery of broached landing craft, and personnel transport and equipment transport. A recapitalized amphibian will provide for improved maintainability and reliability/availability in support of MPF and amphibious operations. Current fielding plan has the first LARC replacement craft arriving in FY19.

IMPACT. LARC-V is a critical asset for supporting landing craft operations. If the LARC-V is not recapitalized, the BMUs will lose the capability to perform its ROC/POE missions to support amphibious operations.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.1 Conduct Amphibious Ops
1.12.5 Conduct Seabasing Ops
4.1.2.4 Conduct Distribution Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2.2.3 Buildup the Force

WARFIGHTING FUNCTIONS

Maneuver
Logistics

SEABASING LINES OF OPERATION

Close
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

4.1 Logistics, Deployment & Distribution, Move the Force, Sustain the Force

Surface Connector Compendium

CURRENT STATUS. The Surface Connector Compendium (previously Connector White Paper) has been reformatted with a draft nearing completion for publish and distribution.

BACKGROUND. After the Amphibious Assault and Amphibious Combat Vehicle AAV & ACV decisions and the 2014 Connector Summit, the Marine Corps set to work on developing a Connector Strategy. The purpose of the strategy was to provide leveling information of connector capacities and capabilities.

Another follow-on to the Summit was the posting of a request for information (RFI) in March 2014 on the FedBizOpps (FBO) website to petition industry for connector concept white papers to inform continuing development of our connector way ahead. On the heels of the RFI, ONR posted a Small Business Innovative Research announcement on FBO as a complementary off-shoot of the RFI. Entitled Technology for Ship-to-Shore Connector Concepts with Combined High Speed Payload Fraction, it sought ideas to enhance low speed platforms, explore novel 'high' water speed technologies and research connectors generally. Phase II awards for up to two concepts are pending.

CAPABILITY OBJECTIVES. The current programs of record (POR) for LCAC (SLEP), FMP, and SLEP extensions, the SSC, LCU sustainment, and SC(X) are the underpinnings of the White Paper. Also included are connector-enabling initiatives and even Army watercraft to complete the picture of the surface-based ship-to-shore assets involved in Naval and joint seabasing operations, as well as the ONR initiatives that may lead to future connector enhancements or enablers.

IMPACT. The goal of the Surface Connector Compendium remains to provide a common framework for the further development of connector enhancement initiatives in conjunction with the Connector Council and potential ideas coming out of the Auxiliary Platform and Payloads Council in terms of operational enablers such as surface connector capabilities. It will continue to undergird and validate the February 2014 CMC guidance that any examination of potential future connector capabilities will not interfere with the current POR.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.5 Conduct Seabasing Ops
4.1.2.4 Conduct Distribution Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2.2.3 Buildup the Force

WARFIGHTING FUNCTIONS

Maneuver
Logistics

SEABASING LINES OF OPERATION

Close
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

3.1 Force Application, Maneuver to Engage, Insert, Influence, (Maritime)
4.1 Logistics, Deployment & Distribution, Move the Force, Sustain the Force

Ship Alterations to Support STUAS

CURRENT STATUS LPD 17 STUAS installations are provided in Table 1. USS IWO JIMA (LHD 7) is planned to be the first LHD 1 class ship to receive the STUAS RQ-21A infrastructure. Ship check and SIDs development are in progress. Planning for RQ-21A onboard LHA 6 and LHA 8 are in progress. Installation of STUAS on ESB 3 Lewis B Puller is planned for FY17.

BACKGROUND. Small Tactical Unmanned Aircraft System (STUAS) provides persistent maritime and land-based tactical reconnaissance, surveillance, and target acquisition (RSTA) data collection and dissemination capabilities to the warfighter. The air vehicle's open-architecture configuration can integrate new payloads quickly and can carry sensor payloads. The system consists of air vehicles, ground control stations and multi-mission payloads that will provide intelligence, surveillance, reconnaissance and communications relay for up to 12 hours per day continuously with a short surge capability for 24 hours a day. Payloads include day/night full-motion video cameras, infrared marker, laser range finder, communications relay package and Automatic Identification System receivers. Ancillary equipment includes launch/recovery mechanisms, tactical communications equipment and spares.

CAPABILITY OBJECTIVES. STUAS installation aboard the LHA 6 and LHA 8, LHD, LPD 17, LX(R) and LSD 41/49 platforms is required in order to provide afloat persistent long range ISR capability in support of MAGTF missions across the range of military operations. Amphibious ships mission profiles include ATF/MEB, ARG/MEU disaggregated or split ARG/MEU and independent deployments.

IMPACT. Inability to provide persistent maritime ISR and RSTA to embarked commanders in support of the full range of military operations aboard amphibious ships and COCOM persistent presence and crisis response requirements.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.1 Conduct Amphibious Ops
1.12.5 Conduct Seabasing Ops
1.3.3.3.1 Conduct Aviation Ops from Expeditionary Sea-based Sites

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2 Conduct Amphibious Ops
1.5.2.1 Conduct Ship-to-Shore or Ship-to-Objective Maneuver

WARFIGHTING FUNCTIONS

Command and Control
Fires
Maneuver
Logistics
Intelligence
Protection
Cyber

SEABASING LINES OF OPERATION

Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

2.2.2 Battle Space Awareness & Collection
3.1 Force Application, Maneuver to Insert, Influence, (Maritime)
5.5.2.2 Command & Control

Table 1: STUAS Installation Status List *

Completed

SHIP	NOTES
LPD 17	Complete
LPD 18	Complete
LPD 19	Complete
LPD 21	Complete
LPD 22	Complete
LPD 23	Complete
LPD 25	Compete

In Progress

SHIP	INSTALL	NOTES
LPD 24	85%	ETC 2QFY17

Planned

SHIP	INSTALL	NOTES
LPD 20	FY17	Planned installation
LPD 26	FY17	Planned installation during PSA
LPD 27	FY18	Planned installation
LPD 28	FY22	Planned installation

* *Information provided by NAVAIR Air/Ship Integration Bi-Weekly activity status report*

MV-22B Aviation Certification

CURRENT STATUS. See *Table 3: MV-22B Aviation Certification Requirement Status List* for current status. This table is the HQMC Prioritized list as of March 2015 and reflects the current progress that NAVAIR has taken to certify all ships to include Combatant ships for V-22 operations. The effort has been categorized in the following sequence and priority of effort:

Priority 1:	Sustainment Operations (MEU/ARG Presence)
Priority 2:	Forward Service Support Mission (i.e. Afloat Forward Staging Base)
Priority 3:	Service Support Operations
Priority 4/5:	Surge/Service Support Operations (MEB/MPF (SE))
Priority 6:	Sealift Operations
Priority 7:	Combat Logistics Operations

BACKGROUND. MV-22 is the medium lift aircraft replacing the CH-46E. It is vital for long range, medium lift, multi-missions, and is capable of conducting combat operations, combat support, combat service support, and special operations missions. MV-22s are a critical component of the Marine's vertical connector strategy for ship-to-ship, ship-to-shore, and ship-to-objective maneuver.

CAPABILITY OBJECTIVES. The Marine Corps requires the MV-22 to be certified on all expeditionary ship classes to include L-Class amphibious warfare ships: LHD, LHA, LPD, LSD, LX(R); MPF ships: T-AK, T-AKR, T-AKE, T-ESD; and support ships T-AVB, T-AH, LCC, T-EPF.

IMPACT. Integration of this capability provides commanders significant flexibility through operational reach, speed, and endurance supporting forces afloat/ashore. Without MV-22 certifications CCDRs are limited in employment options necessary for the projection and sustainment of forces ashore in an A2AD maritime environment. MV-22 certification on all expeditionary ship classes will increase the flexibility and operational reach of the MAGTF.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.5 Conduct Seabasing Ops
4.1.2.4 Conduct Distribution Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2.2.3 Buildup the Force

WARFIGHTING FUNCTIONS

Maneuver
Logistics

SEABASING LINES OF OPERATION

Close
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

3.1 Force Application, Maneuver to Engage, Insert, Influence, (Maritime)
4.1 Logistics, Deployment & Distribution, Move the Force, Sustain the Force

Table 2: MV-22B Aviation Certification Requirement Status List

LEVEL

- **I** Day and Night Operations with Instrument Meteorological Conditions
- **II** Day and Night Operations with Visual Meteorological Conditions
- **III** Day Only Operations with VMC

CLASS

- **1** Landing area with support facilities (service and maintenance)
- **2** Landing area with service facility (fuel and power)
- **2A** Landing area with limited service facility (fuel)
- **3** Landing area without support facility
- **4** VERTREP/External Lift Area Hover in excess of 5 feet
- **5** VERTREP/External Lift Area Hover in excess of 15 feet

TYPE

- **Type 1** Minimum VERTREP/hover area
- **Type 2** VERTREP/hover area (exceeding minimum requirement) with cargo staging area/drop zone aft.
- **Type 3** VERTREP/hover area (exceeding minimum requirement) with cargo staging area/drop zone aft.

Completed

SHIP CLASS	PRIORITY	REQUIREMENT	CURRENT AVCERT/NOTES
LHD 1 – 7	1	I/1, I/4	LHD 1 (JSF Test Platform); requires back-fit flight deck mods for unmitigated Ops
LPD 17-25	1	I/1, I/4/2	LPD 17 and LPD 25 are Class 2 pending upgrades to facilities
LSD 41-45, 47-51	1	I/2A, I/4/2	LSD 43 VERTREP is Class 5
T-AKE 1-14	5	I/2, I/4/2	I/2, I/4 N42 FY15 funded to enhance hangar to Class 1 capability in FY17
T-EPF 1, 3,4	6	I/5/2	I/5/2 VERTREP only
T-EPF 2	6	I/5/2	I/4/2 VERTREP only
T-EPF 5-6	6	I/5/2	III/5/1 VERTREP only

In Progress

SHIP CLASS	PRIORITY	REQUIREMENT	CURRENT AVCERT/NOTES
LHD 8	1	I/1, I/4	I/3, I/4 Requires back-fit flight deck mods for unmitigated Ops
LHA 6	1	I/1, I/4	I/1, I/4 Interim requires back-fit flight deck mods for unmitigated Ops during PSA
LSD 46	1	I/2A, I/4/2	I/5/2 V-22 mods to be scheduled ~FY18 during phased modernization layup
LSD 52	1	I/2A, I/4/2	Scheduled for FY15 re-work; will receive CRES nets/frames during avail
LPD 26	1	I/2, I/4/2	Will receive AVCERT as ship is delivered
LPD 27	1	I/2, I/4/2	Will receive AVCERT as ship is delivered
T-AKR 302	3	II/3, II/4/1	II/4/1 Deck heating analysis complete;; awaiting Flight Sim/Dynamic Interface (DI)
T-AKR 304	3	II/3, II/4/1	II/5/1 Deck heating analysis complete; awaiting Flight Sim/DI
T-AVB 3/4	4	II/3, II/4/1	Nacelle Modulation Authorized; awaiting DI
T-AKR 311/312	4	II/3, II/4/1	II/5/1 Deck heating analysis complete; AVCERT analysis pending
T-AH 19/20	4	I/2, I/4/1	Structural Mods are required for thermal loads; mods are expected in FY17
T-AK 3008	5	II/3, II/4/2	II/5/2 Deck heating analysis complete; flight deck mods required for V22 clearance
T-AK 3009-3012	5	II/3, II/4/2	II/4/2 Deck heating analysis compete; flight deck mods required for V22 clearance
LCC 19/20	5	I/2A, I/4/1	I/4/2 Deck strength/heating complete; general envelope authorized
T-EPF	6	I/5/2	NSWC Carderock conducting feasibility study for launch/recovery ops
T-AO 187	7	II/3, II/4/2	Ships are being certified as fire-wands are received
T-A0E 6	7	I/2, I/4/2	Shipping fire-wands; will complete AVCERT upgrades as ships are available

Not Started

SHIP CLASS	PRIORITY	REQUIREMENT	CURRENT AVCERT/NOTES
LHA 7	1	I/1, I/4	AVCERT on delivery; ship receives unmitigated V-22 Ops if flight deck modified
T-ESB 3	2	I/2, I/4	CV-22 SOF back-fit (4 spots) scheduled 1QFY17
T-ESB 4-5	2	I/2, I/4	AVCERT on delivery
T-ESD 1-2	3	II/4/1	Ship not capable of V-22 certification/operations without major structure design
T-AK 3017	5	II/3, II/4/2	Thermal/structural analysis complete; flight deck mods required
T-EPF 7-10	6	I/5/2	Will receive Class 5 VERTREP once delivered

Lay Up/Decommission

SHIP CLASS	PRIORITY	REQUIREMENT	NOTES
LSD 46	1	I/2A, I/4/2	V-22 mods to be scheduled ~FY18 during phased modernization layup

Indoor Simulated Marksmanship Trainer (ISMT)

CURRENT STATUS. ISMT have been installed on LPDs 17-21 and LPDs 24-25. Installations are planned for LPD 22 (2018) and LPD 23 (2019). The configuration installed in LPD 25 is the baseline for the entire LPD 17 class and a fielding plan (table XX) has been established to ensure each ship of the class meets the baseline requirements for proper operation and training realism. A Ship Change Document (SCD 15307)) has been developed by the Naval Amphibious Baseline Council (NAB) to formally track tracking installation progress. Priority of effort is completion of LPD 26 in Post Delivery Availability in FY16, LPD 27 in FY17, and back-fit in service ships (LPD 17-21) during availabilities schedule across the FYDP. New SCDs are in development for LHA 6 Class which will inform LHA 7 during construction. An SCD for LHD 1 Class ISMT back-fit is in planning which will also inform new construction LHA 8 arrangements. These two ship classes do not have dedicated ISMT spaces, therefore a naval training solution that will leverage existing training spaces and integrate similar Navy and USMC system requirements has been proposed and coordination in progress.

BACKGROUND. The Indoor Simulated Marksmanship Trainer (ISMT) is a three dimensional simulation trainer for indoor instruction in basic and advanced marksmanship, shoot/no-shoot judgment, combat marksmanship, and weapons employment tactics. The trainer consists of an instructor station, audio/visual system, and weapons firing positions for up to 15 lanes. Each firing position is capable of operating simulated weapons that may include:, M2 (.50 cal), M9 pistol, M16A4, , M240MK19, M249 SAW, M870 12 gauge shotgun, SMAW, and 60/81mm mortars.

CAPABILITY OBJECTIVES. The installation of ISMT on all LHA 6/8, LHD 1 LPD 17 and LX(R Class ships to sustain combat readiness for embarked troops. LSD is not under consideration for this capability.

IMPACT. The installation of ISMT on all amphibious platforms will increase marksmanship proficiency during extended periods of embarkation and reduce live ordnance requirements for training.

SCD 15307 BASELINE AND BACK-FIT INSTALLATIONS

LPD 0017 Class	FY16	FY17	FY18	FY19	FY20	FY21	FY22
Ship - SAN ANTONIO - LPD 0017		1			1		
Ship - NEW ORLEANS - LPD 0018		1			1		
Ship - MESA VERDE - LPD 0019			1			1	
Ship - GREEN BAY - LPD 0020*		1		1			
Ship - NEW YORK - LPD 0021			1			1	
Ship - SAN DIEGO - LPD 0022			1				
Ship - ANCHORAGE - LPD 0023				1			
Ship - MURTHA - LPD 0026	1						
Ship - PORTLAND - LPD 0027		1					
Ship - UNKNOWN - LPD 0028							1
Total Ship Installations	1	4	3	1 | 1	2	2	1
Total Site Installations							
Total Installations							
Total Production Units							

Notes:
1) Quantities reflected in black indicate primary availability FY for back-fit installs.
2) Quantities reflected in red indicate alternate availability FY for back-fit installs.
3) Quantities reflected in blue indicated primary availability FY for baseline installs.
4) Primary availability FY will be exectuted to the maximum extent feasible.
*Availability crosses FY17/18.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.8.2 Conduct Precision Marksmanship
1.12.1 Conduct Amphibious Ops
1.12.5 Conduct Seabasing Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2 Conduct Amphibious Ops

WARFIGHTING FUNCTIONS

Fires

SEABASING LINES OF OPERATION

Assemble
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

1.2.1 Training
3.2 Engagement

Large Form Lithium Ion (Li-Ion) Battery Mitigation Suite/Facility

CURRENT STATUS HQMC CD&I promulgated the Marine Corps Lithium Battery Storage and Charging Requirements Aboard Naval platforms letter dated 11 August 2015. Naval Sea Systems Command (NAVSEA) has developed a ship change document (SCD 83220) to install a hazard mitigation suite for large format lithium batteries aboard LHD 1 and LHA 6 class ships and the MPSRONs to contain the hazards associated with these batteries. This solution is linked to the Joint Strike Fighter LHD/LHA MMP fielding schedules and does not support mobile ground system already deployed. No material solution has been approved or funded for shipboard use in other amphibious ships. NAVSEA has identified spaces requirements in LHA(R) Flight 1 and LX(R) to mitigate future charging and stowage requirements. MCSC is also working with industry to identify material solutions to support USMC aviation and ground battery charging and stowage requirements.

BACKGROUND. New technology is driving increased power requirements and dependency on rechargeable batteries (lithium-ion) to support aviation, weapon systems, sensors, and communications. The demand for high density energy requires fact of life ship changes to mitigate hazards associated with lithium-ion batteries. Weapon stowage, well-decks and hangars are particularly susceptible to battery casualty events due to proximity to other energetics and platforms often have limited access and available space to manage a battery casualty. Large form lithium ion battery stowage/charging facilities DO NOT exist aboard LHD 2-8, LPD 17, LSD 41/49 and LX(R) class ships.

CAPABILITY OBJECTIVES. The Marine Corps requires the capability to transport, stow, maintain, and operate with large format lithium-Ion batteries and associated chargers onboard amphibious warfare ships. Marine Corps units that embark lithium Ion batteries must have the proper facilities and employment plans to ensure weapon systems have adequate state of battery charge to support mission capabilities. Large form lithium ion battery stowage and charging stations are required aboard all LHA, LHD 1, LPD 17, LSD 41/49 and LX(R) class ships. Material solutions should be accelerated (i.e. de-couple SCD 13220 from JSF fielding) to support large form lithium ion battery charging and stowage requirements for the MAGTF ground and aviation systems Mitigation facilities in both LHA (R) and LX(R) design specifications are required for future systems.

IMPACT. Reduced expeditionary force readiness and weapon effectiveness due to reduced status of battery charge prior to employment. Large form lithium ion batteries pose a significant hazard to US Navy ships which must be mitigated by dedicated containment systems. Documented casualties have resulted in explosion, fire and venting of large quantities of toxic gas as a result of thermal runaway events. Inability to properly store large form li-ion batteries aboard amphibious ships and MPF ships can limit the ability of embarked forces to fully deploy and employ weapons and communication systems from naval shipping.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.3.3.3.1 Conduct Aviation Ops from Expeditionary Sea-based Sites
4.2.1 Conduct Aviation Maintenance Operations
4.2.2 Conduct Ground Equipment Maintenance

UNIVERSAL NAVAL TASK LIST (UNTL)

1.1.2.3.3 Conduct Flight Ops

WARFIGHTING FUNCTIONS

Logistics

SEABASING LINES OF OPERATION

Employ
Sustain

JOINT CAPABILITY AREA (JCA)

4.3 Maintain Equipment

Troop Rifle Stowage, Troop Armory and Squadron Armory/Weapon Stowage

CURRENT STATUS. HQMC CD&I promulgated the 2016 Afloat Marine Air Ground Task Force (MAGTF) Weapons Stowage and Armory Requirements letter in FY16. Naval Amphibious Baseline (NAB) SCD 19007 was developed to install new rifle stowage small arms lockers in LHD 1 and LHA 6 class ships. LHD 1, LHD 2, and LHD 8 are planned and funded for FY17. LHA 6 is complete and LHA 7 design is funded, in development and planned for PSA (FY19). LSD 41 and LSD 49 designs are in planning.

BACKGROUND. Amphibious ship (LHA, LHD, LPD 17, LSD 41/49, LX(R)) weapons stowage areas (armories and troop rifle stowage areas) have not paced fielding of USMC ground and aviation weapon systems or deployment/employment CONOPS resulting in shortfalls in form, fit, function, flexibility and capacity. Battle Sight Zero (BZO) must be preserved to maintain weapons accuracy and effectiveness (optics and sights cannot be removed). Secure stowage for advanced optics and associated equipment is not provided in existing weapons stowage areas or separate secure stowage areas.

CAPABILITY OBJECTIVES. Marine Forces embark, deploy and are employed with several types of individual and crew served weapons and their associated components and maintenance kits. The Marine Corps requires armory/weapon stowage facilities aboard amphibious ships that will provide an adaptable, high density, and secure stowage to pace the dynamic weapon technology of our embarked operating or forces.

IMPACT. Reduced expeditionary force readiness as a result of individual weapon system interference with fixed rifle racks optics and sighting system attached and firing accuracy decreases and time to issue increases. Current troop rifle stowage space configurations require disassembly of individual weapons systems for storage, which significantly affects the ability to maintain Battle Sight Zero (BZO). BZO is the proper calibration of the weapon system to the individual Marine and is required to ensure weapon accuracy. Mission success is predicated on proper stowage and maintaining configuration integrity of these critical weapons systems. Troop and squadron armory space arrangements do not support the quantity and types of crew served weapon systems needed for Combat Air Support (CAS) and heavy weapon supporting fires.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.5 Conduct Seabasing Ops
4.1.2.3.1 Provide Munitions Supply and Storage

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2 Conduct Amphibious Ops
4.3 Repair and Maintain Equipment

WARFIGHTING FUNCTIONS

Fires
Logistics

SEABASING LINES OF OPERATION

Close
Assemble
Reconstitute

JOINT CAPABILITY AREA (JCA)

4.2.3 Store Equipment and Supplies

Joint Forces Maritime Modular Systems

CURRENT STATUS USSOCCOM has submitted this requirement as FY17-21 IPL item under the title Sea based Support to SOF with J-8 joint staff directorate and Force Application Functional Capability Board (FCB) as the most appropriate to address the issue.

BACKGROUND. The Joint Force, specifically, USMC and Special Operating Forces (SOF), must use the sea as maneuver space to leverage its inherent force protection aspects due to potential access issues and/or required urban littoral work with partner nation GPF and SOF elements. These forces currently lack the ability to rapidly employ aboard any available Navy vessel for use as an AFSB with capabilities that meet their operational needs.

CAPABILITY OBJECTIVES. Joint development of embark-able, SOF modules (C2, planning, SCIF, berthing, maintenance, armory, medical spaces, etc.) outfitted in standard commercial containers (TEU) and are platform agnostic. These modules shall enable the rapid employment of USMC and SOF aboard most any platform as an AFSB allowing the Joint Force to effectively use the maritime maneuver space to accomplish their mission. Capabilities must include execution of command and control from the afloat platforms.

IMPACT. The USSOCCOM Integrated Priority List (IPL) has included this capability in the larger 'Sea based Support to SOF' category, which lists this requirement as having "significant" operational risk to related missions if this requirement is not met. This capability will significantly enhance the greater Joint Force mobility, loiter, mission space, responsiveness, force protection and strike actions in maritime/littoral domains. This ability will be especially important for crisis response capability, especially in the context of the 'Pivot to the Pacific' strategy; large maritime environment, strong partner nation capabilities in maritime/littoral domain.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.5 Conduct Seabasing Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2 Conduct Amphibious Ops

WARFIGHTING FUNCTIONS

Command and Control
Maneuver
Logistics
Fires
Intelligence
Protection
Cyber

SEABASING LINES OF OPERATION

Close
Assemble
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

2.2.2 Battle Space Awareness & Collection
3.1 Force Application, Maneuver to Insert, Influence, (Maritime)
4.1 Logistics, Deployment & Distribution, Move the Force, Sustain the Force
5.5.2.2 Command & Control

Afloat MAGTF C4 Capabilities and Information Dominance

CURRENT STATUS. 2015 AMC4RC was signed by DC, CD&I and submitted to OPNAV N2/6 and N95.

BACKGROUND. The required afloat Command, Control, Communications, and Computers (C4) capabilities to support maritime and amphibious operations across ROMO are critical. The increased reliance on information superiority, extended battle space and increased cyber threats demand a flexible, robust and protected domain capable of enabling all warfighting functions. The brisk evolution of technology dictates that the enterprise rapidly inserts next generation solutions to support the warfighter. The chasm between afloat and ashore capabilities continues to exist and in some cases is expanding.

Since 1992, the Marine Corps has published these requirements in various formats. The 2015 Afloat MAGTF C4 Required Capabilities letter maps gaps and capabilities to the required solutions and/or services. Produced annually, this letter articulates priorities to inform Navy and Marine Corps POM funding cycles.

REQUIRED CAPABILITY. The capabilities and services as put forth in the 2015 AMC4RC.

IMPACT. Afloat networks continue to degrade and become obsolete faster than they can be upgraded or refreshed. This impacts all facets of C2 (e.g. Common Operational Picture/Common Tactical Picture situational awareness; Intelligence, Surveillance and Reconnaissance (ISR) receipt and dissemination; etc.) for embarked USN & USMC elements. Degraded shipboard networks are impacting operations as reported by the deploying ARG/MEUs. CANES will provide network upgrades, enterprise services (chat, e-mail, internet, and video) increased network security, and virtualization in a capable afloat network environment.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

Refer to the 2015 AMC4RC letter

UNIVERSAL NAVAL TASK LIST (UNTL)

Refer to the 2015 AMC4RC letter

WARFIGHTING FUNCTIONS

Command & Control
Fires
Maneuver
Logistics
Intelligence
Force Protection
Cyberspace and Electromagnetic Spectrum

SEABASING LINES OF OPERATION

Close
Assemble
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

Refer to the 2015 AMC4RC letter

Advanced Mooring System (AMS)

CURRENT STATUS AMS will complete its S&T phase in FY16. No transition or procurement path has been identified.

BACKGROUND. One of the most difficult challenges facing forces conducting sea based operations is the need to bring ships, vessels, craft, and lighterage together in order to transfer personnel, equipment, and cargo from one platform to another in less than ideal weather conditions. The AMS under development by the Office of Naval Research (ONR) in partnership with PEO Ships and Navy Facilities Engineering Command Sealift Support Program Office (NAVFAC SSPO) enables frequent, safe, and fast mooring at sea with minimal manpower (no line handling). When installed on the T-ESD or other ships it facilitates their use as a hub for transfer of materials, equipment, payloads, mission packages, and personnel.

CAPABILITY OBJECTIVES. An easily transportable system for at-sea mooring.

IMPACT. AMS will help sea based forces quickly & safely moor connectors to include T-EPF and high flare container ships to the T-ESD in high sea states. In addition to enhancing deck crew safety, AMS significantly widens the operating envelop for force closure, arrival and assembly, employment, sustainment, and reconstitution.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.5 Conduct Seabasing Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2.2.3 Buildup the Force

WARFIGHTING FUNCTIONS

Maneuver
Logistics

SEABASING LINES OF OPERATION

Close
Assemble
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

4.1.3 Deploy the Force

Interface Ramp Technology (IRT)

CURRENT STATUS. ONR's IRT S&T effort was completed in late 2014 after which it delivered those technologies to PEO Ships for further R&D development and ramp design. Incorporation of IRT ramp technologies on T-EPFs and future ship construction is an ongoing discussion within the Navy.

BACKGROUND. The T-EPF is a critical surface connector, linking intermediate staging bases, ships of the sea base, and forces operating ashore. The T-EPF—as currently delivered—is limited in its ability to affect those connections in all but the lowest sea states. In order to enhance its ability to transfer personnel, equipment, and cargo within the sea base in more adverse environmental conditions the T-EPF needs a more capable ramp.

CAPABILITY OBJECTIVES. An advanced, lightweight, cost-effective ramp system for the T-EPF capable of SS3 (threshold) and SS4 (objective) operations. The current T-EPF ramp is limited to SS1 operations.

IMPACT. The IRT project developed technologies for future T-EPF ramps. T-EPF's incorporating these technologies will offload quickly and efficiently across a wider range of operating conditions than is possible with the current T-EPF ramp. IRT technologies will lead to an advanced, lightweight, cost-effective ramp system for the T-EPF capable of SS3 (threshold) and SS4 (objective) transfer operations.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.5 Conduct Seabasing Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2.2.3 Buildup the Force

WARFIGHTING FUNCTIONS

Maneuver
Logistics

SEABASING LINES OF OPERATION

Close
Assemble
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

4.1.3 Deploy the Force

Environmental Ship Motion Forecasting (ESMF)

CURRENT STATUS. ONR will complete the ESMF S&T phase during 2016 and is finalizing the transition to PEO Ships for continued development and testing.

BACKGROUND. ESMF significantly increases the safety of inter- and intra-ship operations while also extending the operating environment for various missions. ESMF's ability to predict ship motions will significantly increase the safety of operations between two vessels conducting cargo transfer at sea (LMSR/T-ESD, T-ESD/LCAC, etc.). It extends the operational environment for various missions by predicting time periods or ship headings where cargo movement may be conducted despite sea states normally considered beyond safe operating limits.

CAPABILITY OBJECTIVES. A decision support tool forecasting wave motion and ship motion in response to wave motion. The tool will help ship captains, masters, and their deck crews determine whether it is prudent and safe to conduct ship-ship transfer of people, equipment, and cargo. ESMF's components include a wave radar and a computer distributing environmental and ship motion information to operators throughout the ship.

IMPACT. ESMF helps ship captains, masters, and their deck crews determine whether it is prudent and safe to conduct ship-ship transfer of people, equipment, and cargo. It extends the operational environment for various missions by predicting time periods or ship headings where cargo movement may be conducted despite sea states normally considered beyond safe operating limits.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.5 Conduct Seabasing Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2.2.3 Buildup the Force

WARFIGHTING FUNCTIONS

Maneuver
Logistics

SEABASING LINES OF OPERATION

Close
Assemble
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

4.1.3 Deploy the Force

Flexible Sea-based Force Projection (FSFP)

CURRENT STATUS. No transition or procurement path has been identified.

BACKGROUND. FSFP is unique approach for reducing local sea states (vice engineering ever stronger interfaces). Inflatable, fillable rigid structures deploy as wave barriers that reduce sea states in and around ships, vessels, craft, and platforms from SS4 to SS3 or from SS3 to SS1. An added benefit of the FSFP is its use of the same inflatable structure technologies to enable launch and recovery of amphibious vehicles from other than amphibious ships.

REQUIRED CAPABILITY. Inflatable structure technologies to facilitate cargo transfer operations, surface connector interfaces, and amphibious vehicle launch and recovery in the sea base by mitigating local sea states and increasing the functionality of existing platforms.

IMPACT. FSFP's payoff is increased access to ships and their equipment across the sea base, better at-sea transfer operations in higher sea states, and potential launch & recovery interfaces for amphibious vehicles.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.5 Conduct Seabasing Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2.2.3 Buildup the Force

WARFIGHTING FUNCTIONS

Maneuver
Logistics

SEABASING LINES OF OPERATION

Close
Assemble
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

4.1.3 Deploy the Force

Ultra Heavy-Lift Amphibious Connector (UHAC)

CURRENT STATUS One fifth and half-scale demonstrators have been successfully tested, and ONR product managers are currently working with a number of stakeholders within the Department of the Navy to secure funding for development of a full-scale technology demonstrator. The complexity of design, energy demand, maintainability and total ownership costs of a full sized UHAC have not as yet been determined.

BACKGROUND. UHAC is an ONR initiative to mature and refine technologies for use in future watercraft development programs. A displacement craft with buoyancy and propulsion provided by an innovative common articulating cell (CAC) technology, a future full scale UHAC would have up to three times the payload of the LCAC-100 and approximately the payload of a 1600-series LCU. It would have the same well deck footprint as an SSC with speeds twice that of an LCU. The CAC technology also yields a low ground pressure footprint (less than 2 psi) giving it the ability to traverse mud flats or climb over obstacles in excess of 10 feet. With a projected range of over 200 miles, UHAC could deliver forces and sustainment from well over-the-horizon.

CAPABILITY OBJECTIVES. Development of amphibious craft technologies potentially yielding three times the lift capacity of the LCAC-100 at twice the speed of the LCU with much greater coastal access than either craft. Technologies developed under the UHAC program could inform the design of the next generation of ship-to-shore connectors and connector enhancements.

IMPACT. Future surface connectors with UHAC's speed, payload, range, and ability to operate to and through a beach gives MAGTF commanders a significant advantage in projecting force ashore.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.1 Conduct Amphibious Ops
1.12.5 Conduct Seabasing Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2 Conduct Amphibious Ops
1.5.2.1 Conduct Ship-to-Shore or Ship-to Objective Maneuver

WARFIGHTING FUNCTIONS

Logistics

SEABASING LINES OF OPERATION

Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

3.1 Force Application, Maneuver to Engage, Insert, Influence, (Maritime)
4.1 Logistics, Deployment & Distribution, Move the Force; Sustain the Force

Large Vessel Interface (LVI) LO/LO

CURRENT STATUS. LVI LO/LO completed its S&T phase in 2011. Technology has been completed and will inform future MPF recapitalizations.

BACKGROUND. LVI LO/LO is an advanced, motion-compensated, at-sea cargo transfer system enabling transfer of fully-loaded cargo containers between ships and vessels in up to SS4. Once the technology is fully developed, it will give the warfighter the ability to move containerized logistics through the sea base without having to secure a deep water port for container ship off-loading. This capability greatly increases potential throughput of the sea base, and provides a key logistical enabler for support of joint forces operating ashore.

CAPABILITY OBJECTIVES. An advanced, motion-compensated, at-sea cargo transfer system that enables transfer of fully-loaded cargo containers between ships and vessels in sea state 4 and below.

IMPACT. The fully developed technology gives the warfighter the ability to move containerized logistics through the sea base without having to secure a deep water port for container ship off-loading. This capability greatly increases the potential throughput of the sea base, and provides a key logistical enabler for support of a joint task force operating ashore.

CAPABILITY DEVELOPMENT FACTORS

MARINE CORPS TASK LIST (MCTL)

1.12.1 Conduct Amphibious Ops
1.12.5 Conduct Seabasing Ops

UNIVERSAL NAVAL TASK LIST (UNTL)

1.5.2.2.3 Buildup the Force

WARFIGHTING FUNCTIONS

Maneuver
Logistics

SEABASING LINES OF OPERATION

Close
Assemble
Employ
Sustain
Reconstitute

JOINT CAPABILITY AREA (JCA)

4.1.3 Deploy the Force

RECOMMENDED WEBSITES

SEABASING DIVISION. http://www.mccdc.marines.mil/Units/Seabasing.aspx

USMC CONCEPTS & PROGRAMS. https://marinecorpsconceptsandprograms.com/

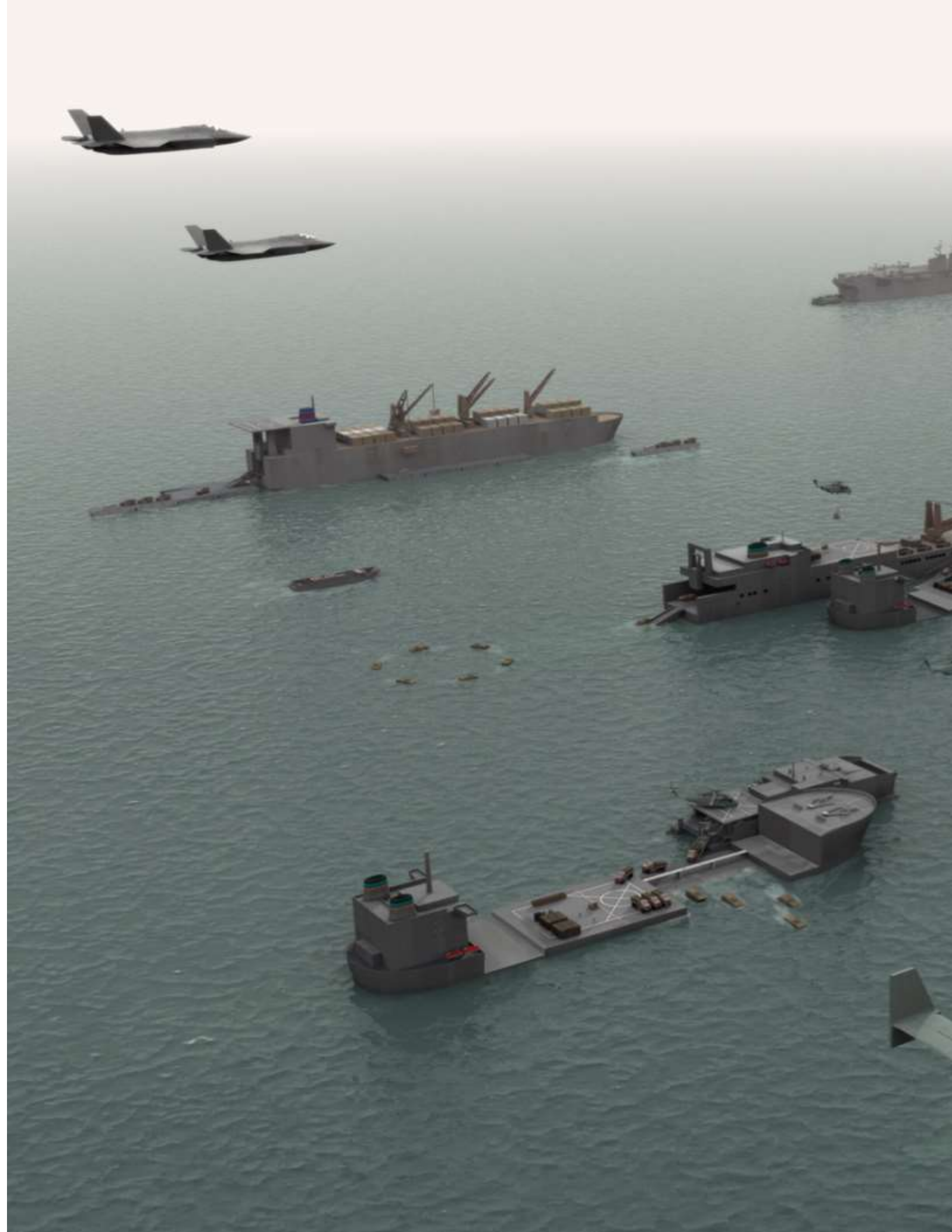
USMC INSTALLATIONS & LOGISTICS. http://www.iandl.marines.mil/Divisions/LogisticsPlansPoliciesStrategicMobility(LP)/LogisticsPlansandOperationsBranch(LPO)/LPOMission1.aspx

MARINE CORPS CENTER FOR LESSONS LEARNED. https://www.mccll.usmc.mil/index.cfm (CAC Required)

MILITARY SEALIFT COMMAND. http://www.msc.navy.mil/

NAVSEA PEO SHIPS. http://www.navsea.navy.mil/Home/TeamShips/PEOShips.aspx

MARINE CORPS PREPOSITIONING INFORMATION CENTER. https://mcpic.bic.usmc.mil/Default.aspx



"We will develop naval expeditionary forces capable of supporting establishment of sea control, denying the sea to adversaries, and conducting operational maneuver from the sea in Anti-Access/Area Denial (A2/AD) environments against all possible threats."

- General Robert B. Neller

37th Commandant of the marine corps

UNITED STATES MARINE CORPS

Seabasing Integration, Combat Development Directorate, Combat Development & Integration

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