ANNEX E
Seabasing Integration Platforms, Programs and Systems

Significant improvements will be provided with the addition of the MLP, T-AKE, LMSR and other platforms to the MPF as detailed in **Chapter One** and **Annex C**. Science and technology investments are intended to further enhance the CAESR lines of operation, and enable the Nation to fully realize the transformational naval, joint, and inter-agency Seabasing capability as envisioned in the below excerpt from the Seabasing JIC.

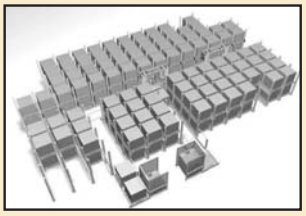
CLOSE joint sea-based capabilities, including elements of joint command and control, to a joint operations area (JOA) to support major combat operations within 10-14 days of execution order.
ASSEMBLE and integrate joint capabilities from the sea base to support major combat operations within 24-72 hours of arrival within the JOA.
EMPLOY over-the-horizon from the sea base at least one (1) brigade for Joint Forcible Entry Operations within a period of darkness (8-10 hrs).
SUSTAIN joint sea-based operations, including up to at least two (2) joint brigades operating ashore, for an indefinite period using secure advanced bases up to 2000 nm away; also support selected joint maintenance and provide level III medical within the sea base.
RECONSTITUTE one (1) brigade from ashore to the sea base and reemploy within 10-14 days of execution order.

Seabasing JIC Top-Level Measures of Performance (Threshold)

Description: Per NOC 10, "...ongoing initiatives are focused on enhancing the Naval Service's capabilities to project task-organized forces at and from the sea. These capabilities include additional high-speed intra-theater lift, improved connectors that can transfer people and materiel at-sea, enhanced maritime prepositioning, and integrated naval logistics. These and other emerging initiatives will be employed in combination to reduce the joint force's reliance on ports in the operational area." These include internal ship cargo handling; ship-to-ship cargo transfer; and connector technologies enabling capability initiatives from ONR's Future Naval Capability program amplified below.

Internal Ship Cargo Handling Technologies

SYSTEM	DESCRIPTION
Compact/Agile Material Mover	Enables efficient weapons/cargo transport in high sea states by providing the capability to move very large payloads of approximately 10,000 lbs using minimal manpower (human amplification technology).
Automated Warehouse	Enables automated storage and retrieval of cargo/munitions onboard ship at rates of over 250 pallets (standard pallet or joint modular intermodal container) per hour.
High Rate Vertical/Horizontal Material Movement	Enables the automatic transition from the horizontal to vertical plane and vertical to horizontal plane during cargo/munitions movement in sea state 5. Enabling technology for strike-down to occur at the rate of underway replenishment reception to achieve required sortie generation rate, and reduce overall manning.

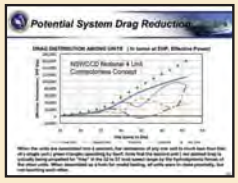


Ship-to-Ship Cargo Transfer Technologies

SYSTEM	DESCRIPTION
Large Vessel Interface Lift-On/Lift-Off (LVI LO/LO)	Advanced positive-control crane that enables the rapid and safe at-sea transfer of standard ISO 20 ft containers from military or commercial vessels onto the sea base in sea state 4.
Small-to-Large Vessel At-Sea Transfer	Enables efficient combined MLP, LCAC/SSC, and MPF/LMSR on-load/off-load operations through the high end of sea state 4 through the development of close-in precision dynamic positioning systems, and advanced fender interface systems.
Interface Ramp Technologies	Enables vehicle transfer via an advanced side port ramp system consisting of a lightweight ramp section, integrated advanced connections, and an active, motion mitigation ramp foot. Current product focus is sea state capable ramp for JHSV.
Advanced Mooring System	Enables automated mooring/positioning of connectors and ships alongside MLP and JLOTS assets in higher sea states.

Connector Technologies

SYSTEM	DESCRIPTION
High Speed Ship-to-Shore Connector	Lift fans and advanced skirts enables SSC by providing the connector with the capability to carry greater payload or have increased range, operate at higher speeds in sea state 4 conditions, and still allow for well deck and beaching operations.
38 Megawatt Axial Flow Waterjet	Enables rapid closure of equipment, materials, and personnel to the sea base via high speed surface connectors. Addresses the need to develop high levels of propulsive thrust in a constrained propulsor diameter.
Intra-Connector Material Handling	Enables the rapid tensioning and instant release of vehicular cargo onboard current and future surface connectors.
Skin-Friction Drag Reduction	Enables rapid closure by providing a means of reducing the hydrodynamic drag of the ship moving through the water which will enable greater speed, range, and/or payload.



Status: Testing of Seabasing enabling technologies continued during 2010 with promising results. During the Vehicle Transfer At-Sea Test (VTAST) conducted in January and February 2010, the US Navy demonstrated the transfer of vehicles between the surrogate MLP, Motor Vessel Mighty Servant 3, and the LMSR, USNS Soderman (T-AKR 317). The test demonstrated a self-deploying vehicle transfer system ramp installed on the surrogate MLP; a new self-deploying sideport platform installed on the LMSR; LMSR enhanced heading control system; and surrogate MLP dynamic positioning thruster operations. Deployment and retrieval of the ramp was controllable by one person. In case of failure, the vehicle transfer system could safely continue to support vertical and horizontal design loads and allow emergency ship separation while carrying a vehicle weighing up to 80 tons anywhere along the length of the ramp. Personnel and vehicles were successfully transferred between the ships in high sea state 3 and low sea state 4 during several days of testing in the Gulf of Mexico. 87 USMC and U.S. Army wheeled and tracked vehicles conducted round trip transfers including high mobility multi-purpose wheeled vehicles (HMMWVs), HMMWVs with trailers, medium tactical vehicle replacements, logistics vehicle system wreckers, AAVs, M88 tank recovery vehicles, and M1A1 main battle tanks.

In May 2010, ONR's LVI LO/LO successfully completed sea trials off the coast of Panama City, FL moving 128 20-foot containers aboard the U.S. Maritime Administration's auxiliary crane ship SS Flickertail State (T-ACS 5). To perform its duties and safely move cargo between two vessels while both were underway on a rolling sea, the LVI LO/LO crane temporarily installed on Flickertail State relied on inputs from sensors, cameras and motion-adjusting software to calculate the ships' motion relative to each other to a high degree of accuracy, and compensated for pitch, roll and yaw of both vessels. LVI LO/LO may ultimately enable the Navy to conduct replenishment or logistics operations transferring large commercial shipping containers in support of the sea base when a sheltered harbor or port is unavailable.