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MARITIME PREPOSITIONING FORCE (FUTURE) CAPABILITY ASSESSMENT

Planned and Alternative Structures

ROBERT W. BUTTON, JOHN GORDON IV
DICK HOFFMANN, JESSIE RIPOSO, PETER A. WILSON

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Summary

This study examines various possible changes to the planned composition of the Maritime Prepositioning Force (Future) (MPF[F]). At the time of this analysis, the planned 14-ship MPF(F) squadron will consist of

- two modified LHA (replacement) (LHA[R]) large-deck amphibious assault ships equipped with Marine Expeditionary Brigade command and control facilities
- one modified LHD large-deck amphibious ship
- three Lewis and Clark dry cargo/ammunition ships (T-AKEs)
- three modified large, medium-speed, roll-on/roll-off (LMSR) sealift ships
- three mobile landing platform (MLP) ships each capable of operating six landing craft, air cushioned (LCAC) surface connectors
- two legacy “dense-pack” MPF ships taken from existing squadrons.2

LHA(R)s and LHDs have large flight decks and hangar decks for embarking and operating helicopters and tilt-rotor aircraft. LHA(R)s and LHDs also provide medical capabilities: With six operating rooms, 17 intensive care unit beds and 60 overflow beds, LHDs have the greatest medical capability of any amphibious platform in operation.

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2 A more detailed description of the program of record MPF(F) squadron is provided in Appendix B.
Most of the possible variations from the program of record MPF(F) entail removing large-deck ships: the LHA(R)s and the LHD. Additionally, we examined cases where a fourth MLP is added (with six additional LCACs) in order to assess a situation where only surface connectors can be used. Most of our analysis focuses on major combat operations (MCOs), but we did consider the possibility of the MPF(F) supporting counterinsurgency (COIN) and special operations. This analysis does not examine the ability of the MPF(F) to support joint operations; rather, it concentrates on the ability of a modified MPF(F) to sustain United States Marine Corps (USMC) Marine Expeditionary Brigades (MEBs).

Analysis and Scenarios

Our analysis assessed potential sea base logistic support performance in MCOs and in COIN operations. It also treated potential roles and capabilities for MPF(F) as an afloat forward staging base for joint special operations. Our MCO scenario cases included support to a single MEB and simultaneous support to two MEBs. Our MCO scenario cases also included scenarios in which constraints (such as a requirement for air-only sustainment) are placed on the use of MPF(F) connectors. We varied MPF(F) assets within the context of the MCO and COIN operation cases. Sustainment distances were also varied for each case. The result is a wide-ranging logistic support analysis.

Our analysis was not limited to the consideration of logistic support. We also considered implications for casualty evacuation (CASEVAC) and care and for the movement of supplies and equipment ashore. In that regard, note that the planned composition of the MPF(F) is based in large part on the USMC requirement that the ground-maneuver elements of the MEB that is carried aboard the MPF(F) be capable of moving ashore in one period of darkness. That requirement to a large extent drives the need for the 18 LCAC hovercraft aboard the new MLP ships (or 21 LCACs including those aboard the single LHD in the squadron). The relatively large tonnage capacity of the LCACs is needed to deploy several thousand Marines and their
equipment ashore in one cycle of darkness. Once the maneuver elements are ashore, however, the daily tonnage requirement of the MEB is far less than the theoretical throughput from ship-to-shore that the LCACs are capable of—not even including the aircraft aboard the squadron. Readers should keep that reality in mind as they encounter study results that show, in many cases, a large theoretical sustainment “excess capacity.”

**Key Findings**

- **Eliminating one LHA(R).** The degradation to logistics throughput resulting from the elimination of one LHA(R) could be offset in all cases by substituting CH-53K helicopters for MV-22 tilt-rotor aircraft; CH-53K helicopters have three times the payload of the MV-22 and, in our scenarios, are just as fast on ingress.³ The MV-22’s higher speed is advantageous in CASEVAC operations, where time is critical and external loads do not limit its speed.

- **Eliminating both LHA(R)s.** The degradation to logistics throughput resulting from eliminating both LHA(R)s cannot be offset by substituting CH-53K helicopters for MV-22 tilt-rotor aircraft; too few aircraft then remain in the MPF(F) squadron. However, a robust throughput capacity remains for all cases considered using air connectors from the remaining LHD and LCACs from the LHD and the MLPs.

- **Eliminating all large decks.** The elimination of all three large decks (both LHA[R]s and the LHD) in the MPF(F), with sustainment conducted entirely using LCACs from MLPs, leaves a marginal capacity to sustain a single MEB (either in MCO or in COIN operations) with three or four MLPs. However, this option also strips out the MPF(F) squadron’s major medical capabilities and

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³ Both helicopters and tilt-rotor aircraft are expected to carry external loads in sustainment operations. The advantage of greater payload weight for internal loads is more than offset by the additional loading time required for external loads. On ingress, aerodynamic constraints imposed by external loads make the MV-22 no faster than the CH-53K. The MV-22 can employ its high speed only on returning from the shore to the sea base.
forces a reliance on slower aircraft for CASEVAC. Aviation command and control capabilities provided by the LHD would also be lost. Further, the ability of MLPs to work with T-AKEs could be constrained by the relatively small number of helicopters carried for vertical replenishments (VERTREPs) by T-AKEs. Finally, removing the aircraft associated with the large flight decks could impose tactical constraints on the MEB commander. While our analysis showed that, in terms of raw throughput, the LCACs of three or four MLPs could meet the MEB’s daily tonnage requirements, we found that significant operational issues could arise without air-capable ships in the force. When sustaining two MEBs in conjunction with an amphibious task force (ATF), throughput capacity is marginal without the addition of a fourth MLP. However, the loss of medical and CASEVAC capabilities is less of an issue. The issues of ability of the MLPs to work with T-AKEs and constraints on the MEB commander are also mitigated by the presence of an ATF.

- **LCAC capacity.** The bulk of ship-to-shore throughput capacity for MPF(F) connectors resides with LCACs. The combined total throughput capacity of the 21 LCACs carried by the MPF(F) alone significantly exceeds daily tonnage requirements for the 2015 MEB. Moreover, the Marine Corps Combat Development Command’s (MCCDC’s) sustainment plans use the three LCACs carried by the LHD; the use of LCACs cannot be discounted completely. However, as noted below, we uncovered important issues associated with a heavy reliance upon LCACs for sustainment.

- **Ashore connectors.** Supplies delivered to the shore by LCACs must be moved forward from the beach (or small port) to the USMC or other forces that will consume the supplies. Such movement requires a quantity of trucks and/or aircraft and a reasonably secure area through which they can move. These conditions will, of course, be situationally dependent.

- **T-AKE/MLP interface.** The USMC does not currently envision a direct T-AKE/MLP interface; the offloading of supplies from the T-AKEs is presently limited to aircraft-only sustainment. This concept would shift the burden of lift from LCACs to vertical-lift
connectors and so reduce the number of CH-53K and MV-22 sorties available to joint force commanders for purposes other than sustainment. In order to realize the full potential of the MLPs’ LCACs, we recommend the Navy and USMC investigate ways that the T-AKEs could interface more closely with the LCACs, either by directly offloading onto the hovercraft themselves or by transloading supplies from T-AKE to MLP, and then into the LCACs.

- **Other LCAC missions.** If the Marine Corps cannot use the full potential of the LCACs, the joint force commander should consider ways to use LCACs for movement ashore and sustainment of other forces. For example, if the MEB does not need, or cannot make use of, the LCACs’ throughput potential, the Army could offload personnel, supplies, and equipment onto the MLPs from Army LMSRs for movement ashore via LCAC.

- **Support for COIN.** The MPF(F) sea base, or portions of it, could provide important capabilities to support COIN operations. Although the daily tonnage requirements of a MEB engaged in COIN operations are situationally dependent, they would be lower than the consumption rates envisioned for MCO, especially in terms of ammunition. Therefore, the overall logistics throughput potential of the MPF(F) could easily support a MEB engaged in COIN operations, as well as additional USMC units or elements from the other services. Given the general desire that local forces have a leading role in COIN, the MPF(F) might also be used to support foreign forces. Finally, COIN operations might not require the employment of all the ships of the MPF(F), depending on the size and duration of the mission.

- **Support for Special Operations Forces (SOF).** The MPF(F) could provide a useful base for SOF operations. Even more than in support of COIN operations, support to SOF might require only a portion of the MPF(F). For example, a single MLP or an MLP plus a large flight deck from the MPF(F) might be sufficient to meet the needs of a SOF element, possibly for a protracted period of time.

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4 This topic is explored in some detail in Appendix A.