LHA-6

Executive Summary

- The LHA-6 will likely satisfy its Key Performance Parameters for vehicular stowage space, F-35 Joint Strike Fighter capacity, vertical take-off and landing spots, cargo space, and troop accommodations. However, all personnel, vehicles, and cargo must be off-loaded via aircraft because the ship does not have a well deck. The Amphibious Ready Group (ARG) Commander will not be able to rapidly offload the ship in support of an amphibious assault due to the lack of a surface means to move heavy equipment ashore. Additionally, the Navy and Marine Corps are finalizing a new concept of operations for deploying LHA-6 as the centerpiece of an ARG.
- The LHA-6 Ship Self-Defense System (SSDS) has demonstrated capability against some classes of anti-ship cruise missile (ASCM) threats. However, based on combat systems testing on other platforms, it is unlikely that LHA-6's SSDS Mk 2-based combat system will meet the ship's Probability of Raid Annihilation (PRA) requirement against all classes of ASCMs.
- LFT&E analysis completed so far identified potential problems in susceptibility and vulnerability that would likely result in the LHA-6 being unable to maintain or recover mission capability following a hit by certain threat weapons, the details of which are classified. The Navy's required updated analysis is behind schedule jeopardizing planning for follow-on ship survivability improvements and final LHA-6 LFT&E.

System

LHA-6 is a large-deck amphibious ship designed to support a notional mix of fixed- and rotary-wing aircraft consisting of 12 MV-22s, 6 F-35B Joint Strike Fighters (Short Take-Off/Vertical Landing variant), 4 CH-53Es, 7 AH-1s/UH-1s, and 2 embarked H-60 Search and Rescue (SAR) aircraft, or a load-out of 20 F-35Bs and 2 embarked H-60 SAR aircraft. Key ship features and systems include:

- Greater aviation storage capacity and an increase in the size of the hangar bay, which is necessary to accommodate the increased maintenance requirements of the F-35B and the MV-22. Additionally, two maintenance areas with high-overhead clearance are incorporated into the design of the ship to accommodate wings-open MV-22 maintenance.
- Shipboard medical spaces reduced by approximately two-thirds compared to contemporary LHDs to expand the hangar bay.
- An SSDS Mk 2-based combat system with the following seven major components.
  - The SSDS Mk 2 Mod 4 control and decision system supports the integration and control of most other combat system elements

  - The ship's AN/SPS-48E and AN/SPS-49A air search radars and the AN/SPQ-9B horizon search radar
  - USG-2 Cooperative Engagement Capability radar tracking systems
  - The Rolling Airframe Missile and the Evolved SeaSparrow Missile (ESSM), with the NATO SeaSparrow Mk 9 Track Illuminators
  - The AN/SLQ-32B(V)2 electronic warfare system with the Nulka electronic decoy equipped Mk 53 Decoy Launching System
  - The Phalanx Close-in Weapon System for air and small boat defense
  - The Mk 38 Mod 2 Gun Weapon System for small boat defense
- Propulsion is provided by two marine gas turbine engines, two electric auxiliary propulsion motors, and two controllable pitch propellers. Six diesel generators provide electric power.
- Command, Control, Communications, Computers, and Intelligence (C4I) facilities and equipment to support Marine Corps Landing Force operations are part of the program of record.
- It does not have a well deck, which is traditionally used to move large volumes of heavy equipment needed for amphibious operations.

Mission

The Joint Maritime Component Commander will employ LHA-6 to:

- Be the primary aviation platform within an ARG with space and accommodations for Marine Corps vehicles, cargo, ammunition, and more than 1,600 troops
- Serve as an afloat headquarters for a Marine Expeditionary Unit (MEU), Amphibious Squadron, or other Joint Force commands using its C4I facilities and equipment

- Accommodate elements of a Marine Expeditionary Brigade when part of a larger amphibious task force
- Carry and discharge combat service support elements and cargo to sustain the landing force

Major Contractor
Huntington Ingalls Industries, Ingalls Shipbuilding Division – Pascagoula, Mississippi

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Activity

- The Navy conducted an operational assessment in December 2012 in accordance with the DOT&E-approved test plan to assess the ship's design.
- The Navy and Marine Corps conducted a wargame in May 2013 to support the development of the concept of operations for an LHA-6 configured ARG.
- The Navy conducted Phase 1 of the Enterprise Test-05 on the SSDS using the LHA-6 combat system configuration in May and June 2013. In two firing exercises, a single subsonic aerial target and a supersonic high-diving aerial target were engaged with Rolling Airframe Missiles (Block 2). The SSDS program is discussed in a separate section of this report. Additional test events against the Multi-Stage Supersonic Target have been delayed until FY17 because of problems with the target's development.
- The Navy has conducted a variety of LFT&E testing and analyses using surrogate ship platforms (including the ex-Saipan (LHA-2) and scale models to develop an understanding of vulnerabilities of LHA-6 design against typical weapons effects. The Navy survivability assessment report that was due in FY12 will not be completed until FY14. This delay has an adverse effect on the planning for future LFT&E test events and limits the opportunity to improve the survivability on follow-on ships.
- DOT&E approved the Test and Evaluation Master Plan Revision A in July 2012.

Assessment

- LHA-6 will likely meet its Key Performance Parameters for vehicular stowage space, Joint Strike Fighter capacity, vertical take-off and landing spots, cargo space, and troop accommodations. However, as the ship does not have a well deck, its capability to offload vehicles and cargo will be limited to those that can be air lifted from the ship, which will limit the capability of the ARG to support the MEU.
- LHA-6 will have an enhanced aviation capability compared to the LHD-1 class ships. In particular, unlike the LHD-1 class ships, LHA-6 should be able to support operations of the entire Marine aviation combat element.
- The reduction in the number of operating rooms and the size of the intensive care unit relative to the LHD-1 class limits the ability of an LHA-6 to support a medical augmentation team. The Navy may increase the number of medical personnel assigned to LPD-17 class ships when operating in LHA-6-led ARGs to compensate for the reduced medical capability on LHA-6.
- The ARG and MEU Commander are able to execute all their missions utilizing an LHA-6-led three ship ARG and MEU. However, relative to an LHD-1-led ARG, an ARG with LHA-6 will require more time to complete some missions due to the reduced number of surface connectors.
- The LHA-6 SSDS has demonstrated capability against some classes of ASCM threats. Based on combat systems testing on other platforms, it is unlikely that LHA-6's SSDS Mk 2-based combat system will meet the ship's PRA requirement against all classes of ASCMs.
- LFT&E analysis completed to date identified potential problems in susceptibility and vulnerability that would likely result in the LHA-6 being unable to maintain or recover mission capability following a hit by some threat weapons. In particular, some fluid systems need additional isolation valves, sensors, and remote operators to allow rapid identification and isolation of damage and reconfiguration for restoration of the mission capability they support. Additionally, the egress from some of the troop and crew berthing spaces may result in crew causalities and delay damage control actions. The Navy has plans to incorporate some corrective actions for follow-on ships.

Recommendations

- Status of Previous Recommendations. The Navy satisfactorily addressed some of the FY08 and FY11 recommendations. However, the Navy needs to finalize the concept of employment for LHA-6, which is still in progress. The Navy is developing a means to provide real-time feedback on weapon system effectiveness against small boat attacks during testing. Additionally, the Navy has partially addressed a recommendation to install a capability to isolate damage and restore vital fluid systems to improve survivability, but testing to verify that improvement still needs to be planned. The Navy conducted a study to determine the benefit of hangar bay divisional doors for LHA-7 to improve the ability to contain a fire and limit the spread of smoke and damage; however, it still needs to evaluate the mission impact for loss of the hanger bay. The Navy has not taken sufficient action on the five recommendations listed below.
  1. Continue to study what effects F-35Bs and MV-22s – particularly aircraft exhaust/noise and required logistic support – will have on the ship and make appropriate adjustments to the design.

2. Correct systems engineering deficiencies related to SSDS Mk 2-based combat systems and other combat system deficiencies so that LHA-6 can satisfy its PRA requirement.
3. Consider the use of solid state automatic bus transfer switches to improve the survivability of electrical power to vital C4I and self-defense systems to improve survivability.
4. Study flight deck manning needs to support surge operations. Mitigation plans should be demonstrated during IOT&E.
5. The survivability improvement recommendations resulting from the analysis of the LHA-6 design should be evaluated for incorporation into the LHA-7 design.

- FY13 Recommendations. The Navy should:
  1. Implement improvements to the SSDS Mk 2-based combat system and test those changes during FOT&E.
  2. Make the Multi-Stage Supersonic Target available to support an assessment of LHA-6 PRA requirement.