

LHA 6 New Amphibious Assault Ship (formerly LHA(R))

Executive Summary

- The Navy identified a budget shortfall in September 2014 that prohibits the completion of IOT&E by the acquisition program's threshold of October 2016 for reaching Initial Operational Capability. The late delivery of the ship and the 3-month extension of the ship's Post Shakedown Availability (PSA) reduced its availability for operational testing prior to her deployment in FY17. The Navy and Marine Corps Operational Test Agencies developed a plan to complete Amphibious Warfare (AMW) IOT&E in conjunction with scheduled, pre-deployment fleet exercises. The Navy's Program Office is also seeking an agreement with fleet and Marine Corps leadership to conduct the Total Ship Survivability Trial (TSST) in conjunction with these fleet exercises to support an operationally realistic load out of the ship during the IOT&E.
- The Navy commenced LHA 6 IOT&E with a test of the Air Warfare Ship Self-Defense System (SSDS). LHA 6 combat system's testing was partially accomplished with mixed results. Challenges to combat system effectiveness persist and lead to questions about the platform's ability to defend against some threats. Several events remain outstanding for the completion of the approved test plans.
- LHA 6 entered her PSA on May 26, 2015, with an anticipated March 25, 2016 completion date. The Navy will implement changes necessary for Joint Strike Fighter (JSF) that will also benefit the incorporation of MV-22 Osprey operations on the LHA 6 during her PSA and will include these changes into the LHA 7 construction plan. LHA 6 will conduct her maiden deployment in mid-2017 with a standard Marine Expeditionary Unit Aviation Combat Element (MEU ACE) that includes AV-8B Harrier aircraft. LHA 6 will complete operational testing with an evaluation of the ship's ability to support a complement of 20xJSF aircraft in FY19.

System

- LHA 6 is a large-deck amphibious assault ship designed to support a notional mix of fixed and rotary-wing aircraft consisting of 12 MV-22 Ospreys, 6 F-35B JSFs (Short Take-Off/Vertical Landing variant), 4 CH-53Es, 7 AH-1s/UH-1s, and 2 embarked H-60 Search and Rescue aircraft, or a load out of 20 F-35Bs and 2 embarked H-60 Search and Rescue aircraft. Key ship features and systems include the following.
 - Greater aviation storage capacity and an increase in the size of the hangar bay, which is necessary to accommodate the enhanced aviation maintenance requirements for the MEU ACE with F-35B and MV-22. Additionally, two maintenance areas with high-overhead clearance are incorporated into the design of the ship to accommodate



- maintenance on MV-22s in the spread configuration (wing spread, nacelles vertical and rotors spread).
- Shipboard medical spaces are reduced by approximately two thirds compared to contemporary LHDs to expand the hangar bay.
- The combat system includes the SSDS MK 2, the Phalanx Close-In Weapon System Block 1B, and the MK 38 Mod 2 Gun Weapon System for defense against air threats and small surface craft. The SSDS MK 2-based combat system integrates with the following five major components:
 - The SSDS MK 2 Mod 4B 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
- Two marine gas turbine engines, two electric auxiliary propulsion motors, and two controllable pitch propellers provide propulsion. 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.

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- LHA 8 is the lead ship for the Flight 1 variant of the LHA(R) Amphibious Assault Ship replacement program. It has a modified flight deck and reduced island intended to enable an aviation support capability similar to that of LHA 6. LHA 8 also includes a well deck for deploying surface connectors.

Mission

The Joint Maritime Component Commander will employ LHA 6 to:

- Serve as the primary aviation platform within an Amphibious Ready Group with space and accommodations for Marine Corps vehicles, cargo, ammunition, and more than 1,600 troops

- Serve as an afloat headquarters for a 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

Activity

- DOT&E observed an enhanced acoustic trial on the LHA 6 in December 2014. This trial collected keel aspect acoustic signatures in addition to the beam aspect signatures. The data will be used by the Navy for the ship's mine susceptibility trial.
- DOT&E observed the Navy's Combat Systems Ships Qualification Trials for LHA 6 from March 9 – 13, 2015, and Final Contractor Trials (FCTs) from March 30 through April 2, 2015. These events are part of the developmental test strategy described in the DOT&E-approved Test and Evaluation Master Plan (TEMP).
- The Navy commenced LHA 6 IOT&E onboard LHA 6 with Enterprise Test (ET) 06 of the Air Warfare Ship Self-Defense capability. The test was conducted in accordance with a DOT&E-approved test plan from April 20 through May 1, 2015, and produced mixed results.
- The Navy released a Request for Proposal on June 25, 2015 directly to General Dynamics National Steel and Shipbuilding Company (commonly referred to as NASSCO) and Huntington Ingalls Industries for the construction of LHA 8. The two shipbuilders are deemed by the Service to be the only two in the country capable of building amphibious assault ships. The Navy anticipates responses for the LHA 8 Request for Proposal in FY16.
- The Navy is developing an LHA(R) TEMP Revision B to address design modifications to LHA 8 to include the addition of the well deck and changes to the flight deck, the island configuration, the combat system, medical spaces, fuel tanks, and supporting spaces. Marine Corps aircraft, surface connectors, and vehicles are also evolving. LHA 8 is intended to bring new operational capability to the fleet, which requires an AMW IOT&E to account for the advancements in modernization from LHA 6.
- In May 2015, the Navy delivered a draft Vulnerability Assessment Report (VAR) for the LHA 6, and is using the findings in its planning for LHA 6's TSST. The Navy has stated it is not planning to execute the Advanced Mine Simulation System (AMISS) trial, which would be used to establish the mine susceptibility of the LHA 6, as agreed to in

the DOT&E-approved TEMP Revision A. To date, the Navy has not presented a valid alternative to conducting the AMISS trial.

- LHA 6 is scheduled to complete her PSA on March 25, 2016. The principle work accomplished during PSA are the design modifications to the flight deck to account for the deck strengthening, heat-resistant material improvements, and lighting positioning to accommodate the JSF F-35B and benefit MV-22 Osprey operations. The flight deck changes have been included in the LHA 7 design currently under construction at Huntington Ingalls shipyard.

Assessment

- The late delivery of the ship, the 3-month extension of the ship's PSA, and the additional requirements to serve as the JSF F-35B test platform, further reduce LHA 6's availability for dedicated operational testing prior to her deployment in FY17.
- The Navy identified a budget shortfall in September 2014 that will prevent the completion of IOT&E prior to the acquisition program threshold of October 2016. The Navy has developed an alternate path to complete the required testing in coordination with LHA 6's pre-deployment fleet exercises.
- During Combat Systems Ships Qualification Trials and FCT events, the ship performed well during deck (anchoring drop test), engineering (main propulsion and mobility), and operational evolutions (flight deck). The ship completed FCTs with an overall assessment of satisfactory.
- Combat system testing in LHA 6 during ET-06 and on the Self-Defense Test Ship during ET-05 (the Self-Defense Test Ship was set-up in the LHA 6 configuration for ET-05) produced mixed results. Several challenges persist to the efficacy of the ship's combat system against all threats. Integration and combat system shortfalls associated with the government furnished equipment provided to SSDS MK 2-based combat systems (as discussed in the DOT&E Self-Defense Operational Mission Capability Report dated November 5, 2012) must be resolved to permit LHA 6 to satisfy its Probability of Raid Annihilation (P_{RA}) requirement.

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This is the greatest risk to the ship successfully demonstrating its survivability.

- Because LHA 6 does not have a well-deck, it will rely exclusively on air assets to move forces ashore. The Navy and Marine Corps are in the process of adjusting their tactics to optimize the capabilities of LHA 6. In particular, the aircraft mix and equipment load-out used on an LHD may not be optimal to rapidly mass combat power ashore from LHA 6. The Navy and Marine Corps need to finalize their tactics prior to the phase of IOT&E in which they will be used.
- LHA 6 TSST, which contributes to the survivability assessment of the ship, was planned to occur during the AMW event to minimize the cost of the test program. The Navy has rescheduled the test to occur just before the LHA 6 AMW Marine Integrated Training exercise, which is projected to occur in March 2017. The Navy is coordinating with the fleet and Marine Corps leadership to ensure the TSST is conducted in an operationally realistic manner.
- The LHA 6 SSDS has demonstrated capability against some classes of Anti-Ship Cruise Missile (ASCM) threats. However, based on combat system's testing on LHA 6 and other platforms, it is unlikely that LHA 6's SSDS MK 2-based combat system will meet the ship's P_{RA} requirement against all classes of ASCMs.
 - The Navy initiated the Fire Control Loop Improvement program (FCLIP) to correct some combat system deficiencies related to self-defense against ASCMs and has the potential to mitigate some of the vulnerabilities.
 - However, The Navy has completed Phase 1 of the FCLIP. What was formally known as FCLIP Phase 2 and 3 are now merged into FCLIP Phase 2, which is not yet funded.
- The MK 29-guided missile launch system used to launch the ESSM experienced several motor failures during ET-06. The ship's crew had to replace vertical train servo motors in both of the MK 29 mounts. Although this was just an inconvenient delay for test activities, motor failures during an unexpected attack could degrade the combat system's ability to intercept incoming threats with the ESSM. The Navy attributes the problem to the increased weight of the ESSM relative to the seasparrow missile it replaces. The Navy is investigating modifying or replacing the MK 29 launch system to handle

the extra weight. In the short term, the Navy is addressing the problem through procedural (e.g., the use of counterweights when loading an ESSM into the launcher) and logistical (e.g., supplying crews with spare motors) efforts.

- In July 2015, the Navy identified it was having problems developing the needed Multi-Stage Supersonic Target. After a review of the options to support the planned IOT&E event, DOT&E determined the Navy did not have an affordable or viable target development plan and its alternative solution was not adequate. Hence, DOT&E recommended the Navy cease the Multi-Stage Supersonic Target development until the requirements are better defined and an affordable solution can be found.
- DOT&E does not agree that the Navy's proposed modeling and simulation-based approach to assessing the mine susceptibility of LHA 6 is adequate. The Navy should therefore plan to execute the AMISS trial as agreed to in the DOT&E-approved TEMP Revision A.

Recommendations

- Status of Previous Recommendations. The Navy has either addressed or established a process through which to address most of the previous recommendations. However, the Navy has not fully resolved the recommendation to correct systems engineering deficiencies related to SSDS MK 2-based combat systems and other combat system deficiencies so that LHA 6 can satisfy its P_{RA} requirement.
- FY15 Recommendations. The Navy should:
 1. Allocate sufficient resources to permit the IOT&E and TSST to be conducted as a stand-alone event for LHA 8 until the plan for executing AMW IOT&E and the TSST in coordination with fleet-exercises can be evaluated for LHA 6.
 2. Resolve the MK 29 launcher system motor failures due to the additional weight of the ESSM.
 3. The Navy and Marine Corps need to finalize their tactics, techniques, and procedures for LHA 6 prior to the phase of IOT&E in which they will be used.
 4. The Navy should plan and resource the mine susceptibility trial for the LHA 6 using the AMISS.

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