

## LPD-17 *San Antonio* Class Amphibious Transport Dock

### Executive Summary

- The Navy is working to correct deficiencies identified during IOT&E that led DOT&E to assess the ship not operationally effective, not operationally suitable, and not survivable in a hostile environment. However, correction of a number of these deficiencies has not yet been verified by follow-on operational testing and some deficiencies have not been corrected.
- The Navy conducted operational testing of the Ship Self-Defense System (SSDS) Mk 2-based combat system on CVN-68 and LHA-6, but has not yet conducted any formal operational testing to demonstrate that improvements to LPD-17's combat system are sufficient to satisfy the ship's self-defense requirements.
- The Navy's Board of Inspection and Survey (INSURV) assessed the material condition of LPD-23 as satisfactory.

### System

- LPD-17 is a diesel engine-powered ship designed to embark, transport, and deploy ground troops and equipment. Ship-to-shore movement is provided by Landing Craft Air Cushion (LCAC), Landing Craft Utility (LCU), Amphibious Assault Vehicles (AAVs), MV-22 tilt rotor aircraft, and/or helicopters. Key ship features and systems include:
  - A floodable well deck for LCAC, LCU, and AAV operations
  - A flight deck and hangar to support Navy and Marine Corps aircraft and helicopters
  - Command, Control, Communications, Computers, and Intelligence facilities and equipment to support Marine Corps Landing Force operations
  - Self-defense against anti-ship cruise missile capability provided by the SSDS Mk 2-based combat system, which includes the Cooperative Engagement Capability radar tracking system and data distribution system, the Rolling Airframe Missile point defense system, the SLQ-32B(V)2 (with Mk 53 Decoy Launching System with Nulka electronic decoys) passive electronic warfare system, and radars (SPQ-9B horizon search radar and SPS-48E long-range air search radar)
  - Two Mk 46 30 mm gun systems and smaller caliber weapons (e.g., Mk 2 50-caliber machine guns) to provide the ship's self-defense against small surface threats



- A Shipboard Wide Area Network that serves as the data backbone for most of the ship's computer systems (LPD-17 is one of the first ships built with a fully integrated data network system.)
- Design features that reduce the ship's radar cross section and are intended to make the ship less susceptible to attack

### Mission

- A Fleet Commander will employ LPD-17 class ships as part of a notional three-ship Amphibious Ready Group or independently to conduct Amphibious Warfare.
- The Commanding Officer will use these ships to:
  - Transport combat and support elements of a Marine Expeditionary Unit or Brigade
  - Embark, launch, and recover LCACs, LCUs, and AAVs for amphibious assault missions
  - Support aerial assaults by embarking, launching, and recovering Marine Corps aircraft
  - Carry and discharge cargo to sustain the landing force

### Major Contractor

Huntington Ingalls Industries – Pascagoula, Mississippi

### Activity

- The Navy's INSURV assessed the material condition of LPD-23, the seventh ship of the class, as satisfactory during Final Contract Trials in July 2013.
- The Navy conducted preliminary modeling and simulation using an unaccredited model to examine whether upgrades and

- corrections to the ship's combat system will improve the ship's capability to defeat raids of anti-ship cruise missiles.
- In February 2013, the Navy developed a plan of action to address deficiencies that affected survivability of the LPD-17 ship class.

## Assessment

- In IOT&E, the Probability of Raid Annihilation and Self-Defense Test Ship events revealed deficiencies with LPD-17's self-defense capability. While some potential improvements have been made, the Navy has not conducted any operational testing to permit a reassessment of that capability.
- Operational testing on other SSDS Mk 2 platforms revealed similar combat system deficiencies to those found during LPD-17's IOT&E, confirming these problems are not LPD-17 specific. In some cases, however, the effects of these deficiencies are significant on LPD-17 because of the combat system's design. DOT&E's classified November 2012 Ship Self-Defense Operational Mission Capability Assessment Report provides further details.
- Although improvements have been made, the Navy has not yet demonstrated the Command, Control, Communications, Computers, and Intelligence capabilities needed to support LPD-17 when performing amphibious assault operations. The Navy still needs to successfully test the Advanced Field Artillery Tactical Data System onboard LPD-17.
- The Navy has improved the reliability of critical systems based on results from INSURV and a review of Casualty Reports from the Operational Commander. Further reliability improvements (described below in the recommendations section) are necessary and the Navy must validate these reliability improvements in FOT&E to confirm the ship class is operationally effective and survivable.
- As the Navy has not conducted testing to demonstrate the effectiveness of deficiency corrections, DOT&E's assessment that the LPD-17 class is not survivable in combat remains unchanged.

## Recommendations

- Status of Previous Recommendations. The Navy has partially addressed previous recommendations by improving the reliability of Shipboard Wide Area Network, amphibious support equipment, propulsion, and Magnetic Signature

Control System. However, these material fixes have not been tested in FOT&E. The Navy should act on the remaining 12 recommendations:

1. Test fixes to critical systems including the Shipboard Wide Area Network and review the effect of ship's manning, training, and logistics support on the reliability and maintainability of ship systems.
  2. Address and test fixes to reliability problems with amphibious support equipment and propulsion equipment during FOT&E.
  3. Continue to pursue mitigations to address integration problems with self-defense in multiple warfare areas.
  4. Conduct FOT&E in order to demonstrate improvements to performance problems related to the Advanced Enclosed Mast Structure (verify installation of the shroud on the SPS-48E radar corrects performance problems).
  5. Improve reliability of critical systems including gun systems, Magnetic Signature Control System, and effectiveness of the SSDS Mk 2-based combat system.
  6. Measure Total Ship Operational Availability over an extended period after completing reliability improvements.
  7. Correct remaining deficiencies from Shock Trial Reports.
  8. Complete FOT&E to test Information Assurance.
  9. Conduct FOT&E using the Advanced Mine Simulation System to determine susceptibility of LPD-17 to enemy mines.
  10. Incorporate outstanding test events as FOT&E into the LPD-17 Test and Evaluation Master Plan.
  11. Develop an FOT&E test plan for adequate, rigorous testing of the critical ship systems that must perform reliably to assure LPD-17 is operationally effective and survivable.
  12. Conduct the Probability of Raid Annihilation study using an accredited model.
- FY13 Recommendation.
    1. The Navy should conduct testing to determine the effectiveness of the planned corrective actions in improving survivability.