

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

### Executive Summary

- LPD-17 is capable of conducting amphibious operations in a benign environment but is not operationally effective, suitable, or survivable in a hostile environment.
- Chronic reliability problems associated with critical ship systems across the spectrum of mission areas reduce overall ship suitability and jeopardize mission accomplishment. The Navy's Board of Inspection and Survey identified similar problems in all of the first four ships of the class.
- There was no Live Fire Testing conducted in FY10. However, the Navy continued their overall survivability analysis; the Navy's final survivability report is expected in FY11.
- DOT&E's Beyond Low-Rate Initial Production (BLRIP) report recommended FOT&E to complete outstanding test events and address an extensive list of deficiencies.



### 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 tiltrotor aircraft, and/or helicopters. Key ship features and systems include the following:

- A floodable well deck for LCAC, LCU, and AAV operations
- A flight deck and hangar to support various Navy and Marine Corps aircraft
- Command, Control, Communications, Computers, and Intelligence facilities and equipment to support Marine Corps Landing Force operations
- A Ship Self-Defense System Mark 2 Mod 2 with Cooperative Engagement Capability equipped with Rolling Airframe Missiles (RAM), the SLQ-32B (V)2 (with Mk 53 Nulka electronic decoys) passive electronic warfare system, and radars (SPQ-9B horizon search radar and SPS 48E long-range air search radar) to provide air warfare ship self-defense
- Two Mk 46 30 mm gun systems and smaller caliber weapons to provide defense against small surface threats
- A Shipboard Wide Area Network (SWAN) that serves as the data backbone for all electronic systems. (LPD-17 is one

of the first ships built with a fully integrated data network system.)

### Mission

A Fleet Commander will employ LPD-17 class ships to conduct Amphibious Warfare. The ship will normally deploy with a notional three-ship Amphibious Ready Group (ARG) but can operate independently. In these roles, the ship will:

- 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
- Conduct non-combatant evacuation operations and other crisis response missions

### Major Contractor

Northrop Grumman Ship Systems – Pascagoula, Mississippi

### Activity

- The Navy completed two IOT&E events in FY10: a Rolling Airframe Missile engagement on the Self-Defense Test Ship in December 2009 and Probability of Raid Annihilation (PRA) modeling and simulation in November 2009. The IOT&E test events were conducted in accordance with DOT&E-approved test plans.
- There was no Live Fire Testing conducted in FY10, however the Navy continued their overall survivability analysis. The Navy's final survivability report is expected in FY11.
- DOT&E's BLRIP report published in June 2010 recommended FOT&E to complete outstanding test events and address an extensive list of deficiencies.

# NAVY PROGRAMS

## Assessment

- LPD-17 is capable of conducting amphibious operations in a benign environment, but is not operationally effective, suitable, or survivable in a hostile environment.
- LPD-17 is able to meet its amphibious lift requirements for landing force vehicles, cargo, personnel, fuel, hangar space, well-deck capacity, and flight-deck landing areas.
- LPD-17 has not yet demonstrated adequate reliability and availability of critical ship systems, including:
  - Control systems – SWAN, Interior Voice Communications System (IVCS), and Engineering Control System (ECS).
  - Support equipment – Cargo Ammunition Magazine elevators, vehicular ramps, main propulsion diesel engines, electrical distribution system, and steering system.
  - Combat systems – SPQ-9B horizon search radar, the Mk 46 Gun Weapons System (GWS), and the Magnetic Signature Control System.
- The following LPD-17 self-defense systems did not demonstrate adequate capability: Mk 46 GWS, SSDS Mk 2, SPQ-9B, and SPS-48/CEC.
- The Navy's Board of Inspection and Survey identified similar deficiencies in identical areas during both acceptance and final contract trials across all four of the first ships of the class. Severe casualties recorded prior to the Full Ship Shock Trial in LPD-19 and during LPD-17's deployment revealed serious fabrication and production deficiencies.
- The ship has not yet demonstrated an adequate Command, Control, Communications, Computers, and Intelligence capability.
- The Navy still needs to validate critical Information Exchange Requirements and pursue a formal Information Support Plan to support a Joint Interoperability Certification.
- The design of San Antonio class ships have numerous survivability improvements compared to the LPD class ships they will replace. However, problems encountered with critical systems during testing, as well as difficulties in recovering mission capability, have offset some of the survivability design improvements and have highlighted the impact of serious reliability shortcomings.
- PRA test bed events and the Self-Defense Test Ship events revealed several combat systems deficiencies and underscored several previously known deficiencies.

## Recommendations

- Status of Previous Recommendations. The Navy has satisfactorily addressed the ship's interoperability with AV-8 aircraft and completed PRA modeling and simulation efforts. All additional recommendations made in FY07, FY08, and FY09 remain valid and the Navy must continue to address them in FOT&E.
- FY10 Recommendations. The Navy should:
  1. Improve the reliability of critical control systems to include the SWAN, IVCS, and ECS.
  2. Improve reliability of critical support equipment to include the Cargo Ammunition Magazine elevators, vehicular ramps, main propulsion diesel engines, electrical distribution system, and steering system.
  3. Improve reliability of key components of the combat systems to include the SPQ-9B horizon search radar, the Mk 46 GWS, and the Magnetic Signature Control System.
  4. Improve the effectiveness of the Mk 46 GWS.
  5. Improve the effectiveness of the SSDS Mk 2-based combat system (detailed SSDS performance is reported separately in this annual report).
  6. Complete deferred test events to include Chemical/Biological/Radiological Defense, Information Assurance, and vulnerability against enemy mines using the Advanced Mine Simulation System.
  7. Correct deficiencies identified in the Naval Sea Systems Command Total Ship Survivability Trial and Full Ship Shock Trial reports.
  8. Improve Total Ship Operational Availability. Measure over an extended period, preferably during a deployment, after making reliability improvements.
  9. Incorporate FOT&E into the updated LPD-17 Test and Evaluation Master Plan to evaluate the efficacy of the corrective actions taken by the Navy to address DOT&E's recommendations.