

## Ship-to-Shore Connector (SSC)

### Executive Summary

- Ship-to-Shore Connector (SSC) delays have resulted in a delivery of the first craft, designated as the test and training craft, at the end of FY17. IOT&E is scheduled for mid-FY19, with Initial Operational Capability planned for FY20. LFT&E events to assess susceptibility of the craft to naval mines, controlled damage test to determine the ability to maintain mission capability following damage from a threat weapon, and seaworthiness testing to verify the modeling results from scale model testing conducted in FY13 are also delayed until FY18. The data and analysis necessary to inform a Full-Rate Production decision will not be available until the end of FY19. The Navy intends to go into full-rate production in FY19.
- In FY16, the Navy completed the data analysis of the live fire full-hull tests conducted in 2015 on the legacy Landing Craft Air Cushion (LCAC), the approved surrogate for this test. This full-scale test data informs the continuing refinement of the models needed to assess the vulnerability of the SSC and personnel to surf-zone mines, fragmenting artillery rounds, and land mines.
- An initial analysis of the live fire full-hull test data confirmed the need for follow-on component tests to aid in determining the survivability of the platform and crew. Additional live fire events are planned for FY17.

### System

- The SSC is a fully amphibious air cushion vehicle intended to replace the existing LCACs.
- Compared to the existing LCAC, the Navy intends the SSC to have increased payload, reliability, and availability.
- The Navy intends to operate the SSC from the well decks of current and planned Navy amphibious ships and onboard the planned Mobile Landing Platform.



- The SSC has ballistic/fragmentation protection for manned crew and embarked troop spaces, various installed and portable damage control and firefighting systems intended to support recoverability from peacetime fire and flooding casualties
- The SSC is designed to carry a crew of 5 and up to 26 passengers with their combat equipment.

### Mission

Commanders will employ amphibious forces equipped with the SSC to transport equipment, personnel, and weapons systems from ships through the surf zone and across the beach to landing points in support of amphibious operations worldwide.

### Major Contractor

Textron Systems – New Orleans, Louisiana

### Activity

- In FY16, the Navy completed the analysis of the full-hull test data collected using an operational LCAC (as a surrogate for the SSC) against a surf-zone mine emplaced under the skirt, an under-hull land mine, and a blast and fragmentation threat. The Navy is using the data to refine the kill criteria used for the SSC vulnerability modeling and simulations. The Navy is preparing a Vulnerability Assessment Report (VAR) with the revised kill criteria from the surrogate testing. This VAR was due in FY16, but the Navy has adjusted the delivery date to the end of CY16. Delays in completing this report and production delays may jeopardize the planning for the controlled damage test planned in FY17 and FY18.
- The 2015 full-hull test data review confirmed the need to conduct additional testing on the propulsion power plant components. The Navy is in the process of planning this test for execution in FY17.
- The 2015 full-hull test data review confirmed the need to evaluate the potential for personnel injury in some of the installed SSC seats for a loading condition similar to those experienced during the test. While the SSC energy-attenuating seats were not available for installation in the Command Module for the full-hull test, the Navy collected data using the LCAC seats to facilitate future analysis on the performance of

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new seats when these become available. The Navy is in the process of planning this test for execution in FY17.

- Armor characterization testing, originally scheduled for early FY16, was delayed in order to allow for the procurement of armor that meets the SSC specifications. The testing began in late FY16 with a partial delivery of armor test coupons and is expected to be completed in FY17.

## Assessment

- The SSC's ballistic/fragmentation protection for manned crew and embarked troop spaces, installed and portable damage control and firefighting systems provide limited capability for recoverability from battle damage incurred during combat.
- The preliminary analysis of the full-hull testing data collected in FY15 identified data that can be used to refine craft damage predictions and crew and troop casualty predictions. DOT&E will assess the validity of this approach to support the final determination of the survivability of the SSC and the crew in FY19.
- The SSC propulsion plant is different from the legacy LCAC, which was used in the full-hull tests. It shares the MV-22 power plant; however, the SSC shafts are larger and have different composite material composition. Based on the full-hull test data review, DOT&E concurs with the Navy's proposal to execute a test to further assess the response of the propulsion plant composite shafts to weapon effects because such data are not available from historical tests (conducted

for helicopters and the MV-22). DOT&E will review the proposed test plan for adequacy in FY17.

- While the SSC has energy-absorbing seats for the pilot and co-pilot, these are designed to mitigate the loading condition to the body during normal operation of the craft. The full-hull test confirmed the need to assess the significance of loading conditions to the occupants of these seats following an under hull blast event. DOT&E will review the proposed test plan for adequacy in FY17.
- The Navy is conducting armor characterization testing in accordance with the DOT&E-approved test plan.

## Recommendations

- Status of Previous Recommendations. The Navy has addressed some of the FY15 recommendations. It evaluated the results of the full-hull tests and determined that additional component tests were warranted. The Navy is currently planning two additional test series to include the propulsion plant composite shaft tests and energy-absorbing seat tests. However, it still needs to address the outstanding FY15 recommendation to evaluate the classified findings from the full-hull test to determine if the risk for personnel casualties can be reduced.
- FY16 Recommendation.
  1. The Navy should complete and deliver the VAR to DOT&E in FY17 to enable adequate planning of remaining live fire test series and determination of platform survivability.