

Joint High Speed Vessel (JHSV) (Expeditionary Fast Transport)

Executive Summary

- Due to the unavailability of the Mobile Landing Platform with the Core Capability Set (MLP (CCS)) and the U.S. Navy's Sea, Air, Land Team (SEAL) Delivery Vehicle (SDV) during the FY13-14 IOT&E, and to further examine suitability, the Navy conducted an FOT&E on the Joint High Speed Vessel (JHSV) (now called Expeditionary Fast Transport) in FY14 and FY15.
- The Commander, Operational Test and Evaluation Force, in conjunction with Marine Corps Operational Test and Evaluation Activity, conducted three FOT&E events: the first two in June and October 2014, and the third in April 2015. The first two events consisted of mooring operations with the MLP (CCS). The third event consisted of launching and retrieving the SDV from the JHSV while at sea.
- On September 22, 2015, DOT&E submitted an FOT&E report and found the following:
 - JHSV interoperability with MLP (CCS) is not operationally effective since, by design (ramp limitation), it can only conduct vehicle transfers when conducted in sea states with significant wave heights of less than 0.1 meters (approximates a Sea State 1), which are normally found only in protected harbors. The JHSV is operationally effective at launch and recovery of the SDV.
 - Although JHSV testing continues to show the ship is operationally suitable in terms of minimum availability, the Ship Service Diesel Generators (SSDGs), waterjets, and Ride Control System (RCS) did not meet their individual reliability goals.
 - The operational restriction of the JHSV's Safe Operating Envelope (SOE) is a major limitation of the ship class that must be factored into all missions.

System

- The JHSV is a high-speed, shallow-draft surface vessel designed for intra-theater transport of personnel and medium cargo payloads for the joint force.
- JHSV bridges the gap between large-capacity, low-speed sealift and small-capacity, high-speed airlift.
- JHSV is a redesign of a commercial catamaran capable of accessing relatively austere ports. Classified as a non-combatant vehicle, JHSV has limited self-protection capability. Design characteristics include:
 - Propulsion provided by four, diesel engine-powered water jets
 - At-sea refueling capability



- Support for 312 embarked troops for up to 96 hours or 104 troops for 14 days
- An integrated ramp capable of loading/off-loading military vehicles, including combat-loaded main battle tanks
- A flight deck with helicopter refueling capability

Mission

Combatant Commanders will use the JHSV to support the flexible, agile maneuver and sustainment of combat forces between forward operating bases, ports, austere littoral access points, and the sea base. Combatant Commanders may employ the JHSV in a transport/resupply role in benign, non-hostile environments to:

- Rapidly transport medium payloads of Marine Corps or Army cargo and combat-ready troops over intra-theatre distances between shore nodes
- Deliver troops, combat-loaded vehicles, and equipment ready to be employed, using only ports with pier or quay wall access and no other infrastructure
- Support sustainment of forces between forward operating bases, ports, and austere littoral access points that would be prohibitive for larger ships to access

Major Contractor

Austal USA – Mobile, Alabama

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Activity

- From June 2014 through April 2015, the Navy's Commander, Operational Test and Evaluation Force and Marine Corps Operational Test and Evaluation Activity conducted an FOT&E on USNS *Spearhead* (JHSV 1) and USNS *Millinocket* (JHSV 3) during the following test periods:
 - Two separate events, one in June in the Long Beach harbor in California, and the other in October 2014 at sea off the coast of Camp Pendleton, California, were conducted to test the JHSV/MLP (CCS) interface.
 - Reliability, availability, and maintainability (suitability) data were collected during all underway periods of the USNS *Spearhead* from June 2014 through June 2015 during its transit and deployment to the 6th Fleet in the Mediterranean Sea and off the coast of West Africa.
 - The launch and recovery of the SDV from the JHSV while inside and outside Pearl Harbor, Hawaii, in April 2015. Testing did not include an evaluation of JHSV's ability to host a Special Operations Force (SOF) mission package.
- In September 2015, DOT&E submitted an FOT&E report detailing the results of testing.
- The Navy and the Marine Corps conducted all testing in accordance with a DOT&E approved test plan.

Assessment

- JHSV is not operationally effective interfacing with MLP (CCS) for open-ocean, at-sea transfer of vehicles. The JHSV ramp cannot handle the small, but continual, relative movement of the two ships when moored skin-to-skin. Although vehicles were successfully transferred inside a protected harbor, transfer operations at-sea failed.
- JHSV is operationally effective at launching and recovering the SDV through Sea State 3 (significant wave height up to 1.25 meters) although two issues arose during testing:
 - Pendulum motion of the SDV when lifted by the crane interfered with its recovery. Personnel handling tending lines were challenged with controlling the swinging of the SDV as they were returning the vessel to its trailer. Anti-pendulation systems for cranes are becoming commercially available, and they may help control this problem.
 - Waterborne Navy SOF personnel involved with the launch and recovery of the SDV reported high levels of exhaust gasses in the vicinity of the launch. These gasses may have an effect on SOF personnel readying themselves for missions requiring oxygen transits.
- JHSV remains operationally suitable although its availability has decreased from an estimated 98 percent reported at IOT&E to 87 percent when including FOT&E data. Main drivers of ship's unavailability were the SSDGs, waterjets, and the RCS.
 - The SSDGs installed in JHSV demonstrated poor reliability during both IOT&E and FOT&E test periods. Their target Mean Time Between Failure was 8,369 hours, but was measured to be only 208 hours in IOT&E and 1,563 hours during FOT&E.

Recommendations:

- Status of Previous Recommendations. The Navy has made progress in addressing previous recommendations from both FY13 and FY14; however, several recommendations remain outstanding. The Navy still needs to:
 1. Determine the best self-deployed transit speed to achieve the 4,700-nautical mile un-refueled range requirement.
 2. Determine a transit speed that allows for a 600 short ton load delivery to 1,200 nautical miles.
 3. Determine an outfitted weight for each hull to enable mission planners to characterize fully loaded transit capability.
 4. Evaluate design improvements identified during the Total Ship Survivability Trials and implement those that will enhance the ship's survivability.
 5. Demonstrate 11-meter Rigid Hull Inflatable Boat launch capability in Sea State 3 (wave heights up to 4 feet).
 6. Review and modify tactics, techniques, and procedures to safely launch Rigid Hull Inflatable Boats in sea states greater than Sea State 2.
 7. Consider a replacement for the Cargo Loading Trailer if a JHSV is utilized routinely to transport 20-foot storage containers.
 8. Implement a reliability growth program for the SSDGs.
 9. Resolve and retest the significant cybersecurity vulnerabilities identified in the classified DOT&E combined IOT&E and LFT&E report.
 10. Provide safety lanyards and harnesses for embarked security team members that man gun mounts. Additionally, provide

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- hands-free communication devices to help coordinate firing engagements.
- 11. Investigate the casualty problem with JHSV's ramp that occurred during the interface test with MLP (CCS) in October 2014. If necessary, reevaluate the need for at sea skin-to-skin operations between JHSV and MLP (CCS).
- FY15 Recommendations. The Navy should address the following recommendations from the September 2015 FOT&E report:
 1. Modify the JHSV ramp to increase its sea state rating, or develop a new, higher sea state rated ramp, then retest at-sea equipment transfers with MLP (CCS) in order to conduct open ocean equipment transfers between JHSV and MLP (CCS).
 2. Investigate the availability of a pendulation control system for the JHSV stern-mounted crane.
 3. Evaluate the effect of JHSV exhaust gases on SOF personnel readying themselves for oxygen transits.
 4. Evaluate JHSV capabilities to support personnel and equipment for various SOF mission packages.
 5. Evaluate whether repairs and alterations to the waterjet reversing buckets, along with alterations to the ship's autopilot system, resolve the failure mode of this equipment, or, alternately, investigate a replacement schedule to minimize waterjet casualty downtime.
 6. Evaluate whether the repairs and alterations to the internal operating mechanism of the forward ride control foils resolves the failure mode.
 7. Complete structural reinforcement of bow structure on the class.

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