

Joint High Speed Vessel (JHSV)

Executive Summary

- The Navy conducted the Joint High Speed Vessel (JHSV) IOT&E July 15 – November 8, 2013, on the USNS *Spearhead* (JHSV-1) and the USNS *Choctaw County* (JHSV-2). DOT&E will provide a combined IOT&E and LFT&E report once data analysis is complete.
- Initial results indicate the following:
 - USNS *Spearhead* cannot make the required 23 knot, 4,700 nautical mile light ship self-deployment transit; current analysis shows a 682 nautical mile deficit assuming a 90 percent starting fuel load with an ending fuel load of 10,000 gallons.
 - It appears that USNS *Spearhead* cannot make the required 35 knot, 1,200 nautical mile, fully loaded (600 short tons) transit. DOT&E is currently conducting analysis.
 - USNS *Spearhead* is roughly 12.5 short tons over the predicted outfitted weight. This contributes to the range deficiency for the fully loaded transit, since 12.5 short tons translate to approximately a 4 percent fuel load or 3,565 gallons.
 - USNS *Spearhead* can support 354 passengers for 96 hours, exceeding the requirement of 312 passengers.

System

- The JHSV is a high-speed, shallow-draft surface vessel designed for intra-theater transport of personnel and medium payloads of cargo for the joint force. It 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, JHSV has limited self-protection capability. Design characteristics include the following:
 - Propelled by four water jets powered by diesel engines
 - Transport capacity of 600 short ton of troops, supplies, and equipment 1,200 nautical miles at an average speed of 35 knots through wave height of up to 4 feet
 - Support 312 embarked troops for up to 96 hours or 104 troops for 14 days
 - Integrated ramp capable of load/off-load of military vehicles to include combat-loaded main battle tanks (M1A2)



- Flight deck with helicopter refueling capability
- Unrefueled self-deploying range of 4,700 nautical miles

Mission

Combatant Commanders will use the JHSV to support the flexible, agile maneuver and sustainment of combat forces between advanced bases, ports, austere littoral access points, and the sea base. Specifically, Combatant Commanders may employ the JHSV in a transport/resupply role in benign, permissive 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, requiring only ports with pier or quay wall access and no other infrastructure.
- Support sustainment of forces between advanced bases, ports, and austere littoral access points that would be prohibitive for larger ships to access

Major Contractor

Austal USA – Mobile, Alabama

Activity

- On November 13, 2012, DOT&E approved the JHSV IOT&E test plan. The IOT&E test plan adopted an integrated test approach where developmental and operational testing were conducted concurrently, with each having its own set of metrics and data collection.
- Commander, Operational Test and Evaluation Force (COTF) and Marine Corps Operational Test and Evaluation Activity conducted the IOT&E on USNS *Spearhead* (JHSV-1) and USNS *Choctaw County* (JHSV-2). Testing began on July 15, 2013, and completed on November 8, 2013.

NAVY PROGRAMS

- The Navy accepted delivery of the USNS *Spearhead* (JHSV-1) on December 5, 2012. After the Post-Delivery Availability, the ship transited from the manufacturing facility in Mobile, Alabama, to the port of Joint Expeditionary Base Little Creek – Fort Story, Virginia. On January 18, 2013, the ship started the Post-Delivery Test and Trials (PDT&T) period.
- The Navy conducted the following integrated tests during PDT&T as part of the DOT&E-approved IOT&E plan.
 - The ship's crew completed the self-deployment unrefueled range testing.
 - COTF and Navy Information Operations Command personnel performed an Operational Information Vulnerability Evaluation to uncover Information Assurance vulnerabilities in the ship's information systems in February and March 2013.
 - The ship's crew demonstrated the capability to feed 354 people (the crew, test personnel, and embarked troops) during the 96-hour end-to-end test.
 - Personnel from the Naval Surface Warfare Center (NSWC), Port Hueneme, California, conducted an underway replenishment (fuel only) ship qualification on USNS *Spearhead* both in port at Norfolk Naval Base and underway in April 2013 without transferring fuel.
 - Personnel from NSWC, Port Hueneme, California, conducted an underway replenishment (fuel only) ship qualification on USNS *Choctaw County* while underway in October 2013, transferring 22,000 gallons of fuel.
 - Personnel from the U.S. Army Aberdeen Test Center assisted with a ramp test at a commercial port in Morehead City, North Carolina, during March 2013.
 - A Navy security team embarked with their weapons along with a Naval Surface Warfare Center Dahlgren inspector in April 2013 to perform a Structural Test Firing to certify the ship's 0.50 caliber mounts. The security team then conducted an Anti-Terrorism/Force Protection exercise firing on a towed surface target.
 - Naval Aviation personnel from Patuxent River Naval Air Station oversaw Aircraft Dynamic Interface testing underway in May 2013. Fleet assets included MH-60R, MH-60S, and MH-53E helicopters.
 - COTF and Navy Information Operations Command personnel conducted Information Assurance Penetration testing to demonstrate the crew's ability to protect, detect, respond, and restore from a cyber-attack on the ship's information systems in July 2013.
- The end-to-end IOT&E test period included the following tests:
 - Naval aviators from Norfolk Virginia Naval Air Station flew an MH-60S helicopter to perform night vertical replenishment and Night Vision Device landings on USNS *Spearhead* during the transit from Joint Expeditionary Base Little Creek-Fort Story to Morehead City, North Carolina.
 - Marines from II Marine Expeditionary Force performed a day into night loading of a reinforced rifle company rolling stock (29 vehicles ranging from High Mobility Multi-purpose Wheeled Vehicles to Amphibious Assault Vehicles) and transportation storage units.
 - Marine aviators from Marine Test and Evaluation Squadron 22 (VMX 22), Jacksonville, North Carolina, flew a Marine Corps Osprey (MV-22) to perform day and night vertical replenishment tests with USNS *Spearhead*.
 - Personnel from the Combatant Craft Division of Naval Surface Warfare Center Carderock Division assisted in the testing of the Rigid Hull Inflatable Boat (RHIB) launches and recoveries at sea.
 - Testers shifted to USNS *Choctaw County* (JHSV-2) to execute in port and underway cargo handling testing.
- The Program Office conducted the Total Ship Survivability Trial (TSST) in conjunction with the IOT&E on USNS *Spearhead*. The TSST consisted of four simulated damage scenarios. For each scenario, the crew attempted to control the damage and recover lost mission capability caused by simulated weapons effects on shipboard systems and equipment.

Assessment

This report provides only preliminary assessments of the JHSV based on test observations on USNS *Spearhead* and USNS *Choctaw County*. The final assessments will be provided in the IOT&E Report in 2QFY14.

- JHSV is capable of fueling at sea.
- The JHSV ramp can accommodate an M1A2 tank (heaviest of required load items) and a Heavy Expanded Mobility Tactical Truck (least maneuverable of required load items) both to a pier/quay wall and to a floating causeway.
- With an embarked security team, which includes both personnel and weapons, JHSV can engage a moving surface threat.
- JHSV manning and facilities can accommodate handling of all required helicopters, with the exception of fuel and power.
- The JHSV crew demonstrated day and night vertical replenishment with MH-60, MH-53, and MV-22.
- The JHSV crew demonstrated efficient loading, securing, and unloading of Marines from II Marine Expeditionary Force personnel and equipment, to include rolling stock.
- The JHSV crew demonstrated they could exceed the 96-hour requirement for transporting and feeding 312 combat troops by supporting 354 people over that period.
- The crew demonstrated the requirement to launch 2 11-meter RHIBs within 40 minutes in Sea State 2 (wave heights up to 2.0 feet). The requirement is up to Sea State 3 (wave heights up to 4 feet).
- The ship's crew demonstrated the underway requirement to move a 27,000-pound container from the mission bay to the flight deck and back in Sea State 3.
- The JHSV's organic container load trailer is not effective for loading 20-foot long metal storage containers. During the IOT&E, the test team took five hours to connect the container load trailer with a storage container and failed to load it aboard

the ship. A 20-foot container was loaded at the ship home port where ramp access from the pier was less restricted.

- JHSV cannot make the required 23 knot, 4,700 nautical mile light ship self-deployment transit. Initial calculations show a 682 nautical mile deficit assuming a 90 percent starting fuel load to a 10,000-gallon ending fuel load. USNS *Spearhead* is currently performing an Energy Audit to determine the ship's best fuel economy. Results of this testing will clarify best average speed for self-deployment transit.
- It appears that JHSV cannot make the required 35 knot, 1,200 nautical mile fully loaded (600 short tons) transit. DOT&E is currently conducting an analysis.
- Initial analyses indicate USNS *Spearhead* was roughly 12.5 short tons over the predicted outfitted weight. This contributes to the fully loaded range deficiency since 12.5 short tons translate to approximately a 4 percent fuel load or 3,565 gallons.

Recommendations

- Status of Previous Recommendations. The Navy has addressed all previous recommendations.
- FY13 Recommendations. The Navy should:
 1. Determine the best self-deployed transit speed to explore the feasibility of a 4,700 nautical mile unrefueled range requirement.
 2. Determine a transit speed that allows for a 600 short ton load delivery to 1,200 nautical miles.
 3. Determine outfitted JHSV weight, hull by hull, to enable mission planners to characterize fully loaded transit capability.
 4. Resolve helicopter fueling and powering deficiencies.
 5. Demonstrate 11-meter RHIB launch capability in Sea State 3 (wave heights up to 4 feet).
 6. Evaluate design improvements identified during the TSST and implement those that will enhance the ship's survivability.

NAVY PROGRAMS