

## Joint High Speed Vessel (JHSV)

### Executive Summary

- The Joint High Speed Vessel (JHSV) is expected to be a high-speed, shallow-draft vessel intended for rapid intra-theater transport of medium-sized Army and Marine Corps payloads.
- A Navy-led Operational Assessment (OA) in January 2009 identified multiple areas of risk to the program's achieving operational effectiveness and suitability.
- The JHSV will likely meet or exceed its threshold requirements; however, missions other than basic transport, as outlined in the Capabilities Development Document (CDD) and Concept of Operations (CONOPS), may prove to be too challenging unless the program pursues objective requirements in selected areas such as ammunition storage and communications.
- DOT&E approved a LFT&E Management Plan with an alternative waiver from full-up system-level testing in July 2008. JHSV is not shock hardened (designed to sustain operations following an explosive laden attack) and will not be subjected to a Full Ship Shock Trial.



### System

A joint Army and Navy (lead) acquisition program, the JHSV will be a modified version of an existing commercially available catamaran designed primarily to serve as a high-speed, shallow-draft medium-lift intra-theater transport vessel and bridge the gap between low-speed sealift and high-speed airlift. Classified as a non-combatant, it will be constructed to American Bureau of Shipping standards and will not be required to meet Navy survivability standards. JHSV will:

- Be propelled by four waterjet propulsors powered by four diesel engines
- Have an overall length of 338 feet with a maximum draft of 15 feet
- Transport 600 short tons of troops, supplies, and equipment 1,200 nautical miles at an average speed of 35 knots with significant wave height of 4 feet
- Support 312 embarked personnel for up to 96 hours or 104 embarked personnel for 14 days
- Operate in primarily permissive environments with limited self-defense consisting of only crew served weapons – four 50-caliber mounts
- Operate with a crew of no more than 41 uniformed Army personnel (Army version) or Military Sealift Command (MSC) civilian mariners augmented by a mission-based detachment of Navy personnel (Navy version).

### Mission

- Combatant Commanders may employ the JHSV in solely a transport/resupply role in benign, permissive environments to:

- Rapidly transport medium payloads of Army and Marine Corps cargo and combat-ready personnel over intra-theater distances between shore nodes
- Deliver personnel and combat-loaded vehicles and equipment ready to be employed regardless of infrastructure or land-based support
- Support sustainment of forces between advanced bases, ports, and austere littoral access points too difficult for larger ships to access
- As delineated in both the CDD and each Service CONOPS, Combatant Commanders may also employ the JHSV to conduct missions that could place the ship in potentially non-permissive environments and may prove to be too challenging for the ship as designed to threshold requirements:
  - Noncombatant Evacuation Operations
  - Humanitarian Assistance/Disaster Relief
  - Support of Special Operations Forces to include capability to launch a SEAL Delivery Vehicle
  - Afloat Forward Staging Base in support of SOF
  - Intermediate Sea Base in support of Carrier Strike Group Interdiction Operations
  - Mobile Headquarters or small command ship
  - Network interoperability to support Army battle command on the move capability – mission planning and rehearsal en route to objective
  - An “enabler” of the Seabasing concept – an alternative means of delivery from advanced bases and Combat Logistic Force ships to sea base forces (up to Sea State 4).

### Prime Contractor

- Austal USA, Mobile, Alabama

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## Activity

- In November 2008, the program received Milestone B certification to start Engineering and Manufacturing Development. The Defense Acquisition Executive directed the Navy to report the status of the most significant risks to operational effectiveness and suitability identified during the OA at the next program review Defense Acquisition Board.
- In November 2008, Austal USA was selected as the shipyard to build the first 10 (low-rate initial production) ships. Five will be delivered to the Army and five to the Navy. The acquisition strategy identifies a total of 18 ships. IOT&E on the first Army and Navy vessels is planned for FY12 and FY13, respectively.
- In November 2008, the Navy completed the Preliminary Design Survivability Assessment Report for LFT&E.
- To date, the Navy has been successful in leveraging similar ship programs, such as Littoral Combat Ship (LCS), and other resources to develop an adequate LFT&E program. However, some knowledge gaps have been identified which challenge the modeling and simulation tools in assessing the vulnerabilities of aluminum, nontraditional hull-forms constructed to primarily commercial standards.
- In January 2009, a combined Navy, Army, and Marine Corps Operational Test Agency team conducted an OA (OT-B1) per the DOT&E-approved OA Test Plan. Experienced fleet operators from the Army, Navy, MSC, and Marine Corps reviewed ship plans and specifications, including data acquired from previously leased experimental craft in an effort to influence ship design prior to the initial critical design review.

## Assessment

- The OA revealed operational effectiveness and suitability risks to achieving the basic point-to-point transport mission:
  - The absence of forced ventilation and air quality monitors in the Mission Bay jeopardizes the safety of the crew and embarked force during onload and offload of vehicles and equipment, particularly in port or at anchor when there is little natural circulation.
  - Storage space for embarked force personal equipment is inadequate. Although an additional unassigned space was added following the initial design review, the ship only provides approximately half of what is required per current DoD transportation allowances.
  - JHSV requirements do not include any metrics for Reliability, Availability, and Maintainability (RAM).
  - The size and make-up of the Navy Military Detachment (MILDET) designed to augment the MSC crew for specific operational evolutions has not been determined and no decision has been made on whether the MILDET(s) will be temporary (mission based) or permanent.
- The OA revealed operational effectiveness and suitability risks to achieving additional required mission sets as

delineated in both the CDD and each Service CONOPS with just the basic (threshold) JHSV. The following were identified:

- The absence of nighttime compatible lighting requires the ship to extinguish Mission Bay lighting at night. This precludes Mission Bay activity during nighttime flight operations when using Night Vision Devices (NVD).
- Military forces embarked on the JHSV will be required to store all ammunition in the vehicles secured in the Mission Bay. There are no magazines other than for the ship's weapons provided for force protection. The JHSV is prohibited from transporting break bulk or palletized ammunition. This could be problematic for embarked forces without vehicles, particularly for Special Operations missions.
- JHSV is prohibited from operating with helicopters equipped with offensive air-launched weapons (missiles, bombs, rockets), limiting their ability to support Special Operations missions or sustainment of a forward deployed force.
- The JHSV threshold communications suite is inadequate to support any mission other than basic point-to-point transport of forces. The Services will be charged with installing objective upgrades to support additional capabilities as described in both the concept of operations and requirements document.
- There is limited capability to provide a graduated response to developing Anti-Terrorism/Force Protection threats. A minimally manned crew will have difficulty manning all four .50-caliber mounts for an extended period of time.
- JHSV is expected to be survivable in completely permissive environments only. Support of Special Operations missions and other combat related missions risks placing the ship in non-permissive environments, thus introducing survivability liabilities to the crew and embarked personnel. JHSV is not designed or expected to be survivable against weapons effects encountered in combat missions.
- The LFT&E Preliminary Design Survivability Assessment and subsequent discussions with the LCS program directed attention on the Navy's knowledge gaps in assessing the vulnerabilities of aluminum, nontraditional hull-forms primarily constructed to commercial standards. These knowledge gaps challenge this test and evaluation program, which relies almost exclusively on Modeling and Simulation (M&S):
  - Lack of relevant test data prevents the validation of LFT&E M&S.
  - Limited testing resources preclude credible LFT&E assessments.

## Recommendations

- Status of Previous Recommendations. This is the first annual report for this program.
- FY09 Recommendations. The Navy should:
  1. Provide forced ventilation or develop tailored techniques and procedures for operating vehicles in the Mission Bay along with a means to monitor the environment to prevent accumulation of toxic or explosive gases.
  2. Increase the available embarked force storage space to meet current defense transportation regulations for a footprint of 312 personnel.
  3. Identify measurable and testable requirements for RAM and a means to monitor reliability growth in the Test and Evaluation Master Plan.
  4. Determine the MILDET size, billet structure, and whether it will be permanent or temporary (mission based). If it will be temporary, further determine how many there will be, where they will originate from, and who will sustain them.
  5. Identify and pursue a resolution to Mission Bay lighting that would allow nighttime Mission Bay and NVD flight operations.
  6. Provide a means to enable an embarked force without vehicles to stow weapons and ammunition or, state this limitation clearly in the CONOPS and provide the source for a certified portable magazine.
  7. Pursue design changes or additions that would permit JHSV to land and operate with helicopters armed with air-launched weapons or, incorporate this limitation in a CONOPS revision.
  8. Pursue installation of selected capability objective communications equipment designed to increase situational awareness to enable the ship to accomplish required missions other than basic intra-theater transport or, incorporate this limitation in a CONOPS revision.
  9. Pursue objective force protection requirement for installation of Remote-Operated Small Arms Mount resulting in increased crew situational awareness and response time.
  10. Identify survivability liabilities to the crew and embarked personnel when JHSV supports combat related missions that may place the ship in non-permissive environments.
  11. Continue the coordination with similar ship programs, such as LCS, and other sources within the Navy to pursue testing opportunities to address knowledge gaps in assessing the vulnerabilities of aluminum, nontraditional hull-forms primarily constructed to commercial standards.

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