# Littoral Combat Ship (LCS)



In FY24, the Navy conducted no operational test and deferred cyber survivability evaluation of the *Independence* variant of the Littoral Combat Ship (LCS) with the Mine Countermeasures (MCM) Mission Package (MP). The Secretary of the Navy expects to certify the replacement of the *Avenger*class MCM ships and the MH-53E Sea Dragon helicopters in U.S. Central Command (USCENTCOM) with the *Independence* variant of the LCS with MCM MP and remaining Expeditionary MCM capabilities in FY25.

### SYSTEM DESCRIPTION

The LCS is a small surface combatant designed for littoral operations and capable of executing open ocean missions. The LCS comprises two seaframe variants: the *Freedom* variant (odd-numbered) and the *Independence* variant (evennumbered). The *Freedom* variant is a monohull design constructed of steel (hull) and aluminum (deckhouse) with two steerable and two fixed-boost waterjets driven by a combined diesel and gas turbine main propulsion system. The *Independence* variant is an aluminum trimaran with two steerable waterjets driven by diesel engines and two steerable waterjets driven by gas turbine engines. LCS seaframes host and derive mission capability from the Surface Warfare (SUW) and MCM MPs.

The SUW MP is scheduled to deploy only on the *Freedom* variant and derives its capability from the following components:

- Two Mk 46 30mm guns
- MH-60R helicopter
- Two 11-meter rigidhull inflatable boats
- Surface-to-surface missile module with 24 Longbow Hellfire missiles

The MCM MP is scheduled to deploy only on the *Independence* variant and derives its capability from the following baseline components:

- AN/AES-1 Airborne Laser Mine Detection System (ALMDS) employed from an MH-60S helicopter
- AN/ASQ-235 Airborne Mine Neutralization System (AMNS) employed from an MH-60S helicopter
- MCM unmanned surface vehicle (USV) with AN/ AQS-20C sonar (MCM USV and mine-hunt)
- Unmanned Influence Sweep System (UISS) that comprises the MCM USV with the mine sweep payload

The MCM MP will incorporate the following systems, pending continued system development:

 Barracuda Mine Neutralization System employed from MCM USV In FY24, the following systems were removed from the MCM MP baseline:

- Knifefish Block I unmanned undersea vehicle
- AN/DVS-1 Coastal Battlefield Reconnaissance and Analysis Block I system

## MISSION

The maritime component commander will employ LCS alone, or within a group of ships, to prepare the environment for joint forces access to littoral regions by conducting MCM or SUW operations, possibly under an air defense umbrella. Due to capabilities inherent to both seaframes, commanders can also employ LCS in a maritime presence role and support deterrence operations. Moreover, the Maritime Security Module of the SUW MP enables the Freedom variant to conduct Maritime Security Operations, including visit, board, search, and seizure (VBSS) of ships suspected of transporting contraband.

## PROGRAM

The LCS seaframes and the combined MPs are each Acquisition Category IC programs. Additionally, several components within the MPs are themselves individual programs of record.

The Navy restructured the MCM USV program, subsuming the UISS program into one USV program with both mine hunt and sweep payloads. In FY24, one Independence-variant ship and one Freedom-variant ship were delivered. The Navy expects the remaining one Independencevariant and two Freedom-variant ships to deliver in FY25. In FY24, three MCM MPs and the final five SUW MPs were delivered with the remaining 21 MCM MPs expected between FY25 and FY33.

The LCS TEMP requires an update to address changes in the test program for the LCS MCM MP and for the Navy's divestment of the Anti-Submarine Warfare MP. The Navy intended to provide this update for DOT&E approval in FY23 but has delayed to FY25.

The Navy declared initial operational capability of the MCM MP and the MCM USV and mine-hunt payload (AN/AQS-20C sonar) and authorized full-rate production of the MCM USV and mine-hunt payload in FY23.

The Secretary of the Navy expects to certify that available LCS with MCM MP, combined with other remaining Expeditionary MCM capabilities, meets MCM operational requirements in the USCENTCOM area of responsibility and supports sunset of the Avenger-class MCM ships and the MH-53E Sea Dragon helicopters in this USCENTCOM area of responsibility, in FY25.

#### » MAJOR CONTRACTORS

 Lockheed Martin Corporation and Fincantieri Marinette Marine team – Marinette, Wisconsin

- Austal USA Mobile, Alabama
- Northrop Grumman Corporation – Falls Church, Virginia

# **TEST ADEQUACY**

In FY24, the Navy introduced no modifications to the *Freedom* variant that would change SUW MP performance and conducted no operational testing.

The Navy conducted no operational testing on the Independence variant with the MCM MP in FY24 and has planned no additional testing. DOT&E cannot determine operational effectiveness of the LCS MCM MP due to insufficient performance data on AMNS and ALMDS that the Navy elected to deliver in FY16 without conducting IOT&E. The Navy continues to work with DOT&E to provide fleet data from the employment of AMNS and ALMDS, but data are not yet sufficient to characterize their performance.

The Navy did not execute the planned FY24 cyber survivability evaluation of the *Independence* variant with MCM MP to include MCM USV and mine-hunt payload, due to unavailability of test assets; allocated funding for this test expired at the end of FY24. A cyber survivability evaluation and an operational performance evaluation of AMNS and ALMDS are required in order to complete the MCM MP IOT&E.

#### PERFORMANCE

#### » **EFFECTIVENESS**

Operational effectiveness of *Freedom* variant with the SUW MP was provided in the classified IOT&E report of July 2020. No modifications have been made that would change that assessment.

Insufficient data are available to determine operational effectiveness of the *Independence* variant with MCM MP due to uncertain performance in AMNS and ALMDS.

#### » SUITABILITY

Operational suitability of *Freedom* variant with the Increment 3 SUW MP was provided in the classified IOT&E report of July 2020. No modifications have been made that would change that assessment.

Insufficient data are available to determine operational suitability of the *Independence* variant with MCM MP, due to insufficient suitability data on AMNS and ALMDS. However, completed analysis suggests that:

- UISS remains not operationally suitable, as detailed in the UISS IOT&E report of June 2022.
- AMNS and ALMDS demonstrated low reliability prior to fleet release, as detailed in the classified LCS MCM MP Early Fielding Report of June 2016. Insufficient reliability data are available to re-assess.

#### » SURVIVABILITY

Cyber survivability of the *Freedom* variant with SUW MP was detailed in the classified June 2023 cyber addendum to the June 2020 IOT&E report. The Navy made no modifications to the *Freedom* variant with SUW MP that would change that assessment.

Insufficient data are available to determine cyber survivability of the *Independence* variant with MCM MP. The program office conducted two cyber developmental tests with NAVSEA Red Team and shared the resultant data with the operational test community, but data did not meet full requirements of operational evaluation for cyber survivability.

# RECOMMENDATIONS

The Navy should:

- 1. Submit for DOT&E approval an update to the LCS TEMP that addresses changes in the test program for the LCS MCM MP.
- 2. Schedule and complete cybersecurity evaluation of the *Independence* variant with MCM MP in FY25.
- 3. As recommended in the FY23 Annual Report, fund and schedule operational test of ALMDS and AMNS in FY25 to sufficiently characterize their performance and determine operational effectiveness of the *Independence* variant with MCM MP.
- 4. As recommended in the FY23 Annual Report, improve

resilience of the *Freedom* variant with the SUW MP to cyber-attack by addressing recommendations in the classified June 2023 cyber addendum to the July 2020 IOT&E report.