

Unmanned Influence Sweep System (UISS) Including Unmanned Surface Vessel (USV) and Unmanned Surface Sweep System (US3)

Analysis of the Unmanned Influence Sweep System (UISS) IOT&E, conducted in FY21, is ongoing, precluding an evaluation of UISS operational performance at this time. While the UISS demonstrated the capability to sweep mines, successfully activating the threat mines simulated in the test, it also experienced problems that challenged its operational effectiveness and suitability. The Navy expects to complete UISS IOT&E in early FY22 to support a full-rate production decision scheduled for April 2022.



System Description

The UISS is a mine clearance system that activates threat mines as it passes by them, referred to as mine sweeping. The UISS includes an Unmanned Surface Vehicle (USV) that powers and tows the Unmanned Surface Sweep System (US3). The USV operates along pre-planned tracks and uses a radar and camera surveillance suite to provide a remote operator with situational awareness and the ability to avoid obstacles or other watercraft. The US3 creates a magnetic field and acoustic noise to represent a target vessel, causing the threat mine to detonate. The Navy intends for the UISS to clear mines within an assigned area, such as a sea-lane, strait, choke point, or fleet operating area, enabling safe transit. The LCS is the primary host, but the UISS can be employed from any appropriately equipped vessel, or from shore.

Program

The UISS is an Acquisition Category III program intended to provide the only organic capability to sweep mines after the Navy retires the aging MCM-1 class Mine Countermeasures Ships and MH-53E Airborne Mine Countermeasures helicopters. The Navy completed an operational assessment in November 2019, informing the decision to proceed with UISS low-rate initial production. The Navy expects to complete UISS IOT&E in early FY22 to support a full-rate production decision scheduled for November 2022. UISS IOT&E contributes to the assessment of mission capability provided by the Mine Counter Measure (MCM) mission package on LCS. The Navy further intends the USV component of UISS to support additional MCM capability with different payloads that are in development.

Major Contractor

Textron Systems Corporation – Hunt Valley, Maryland.

Test Adequacy

In FY21, the Navy conducted the following test events to evaluate the UISS:

- Technical evaluation on LCS in October 2020 to gain Fleet operator proficiency and demonstrate launch and recovery capability. LCS crane problems prevented the intended launch and recovery cycles.
- Operational test in March 2021 of UISS against mine surrogates in shallow waters near Panama City, Florida. The Navy collected UISS effectiveness and reliability data, but operations were shore-based and did not provide launch and recovery data from an LCS.
- Technical evaluation in April/May 2021 that demonstrated launch and recovery capability from an LCS using Fleet operators.
- Operational test in May/June of UISS conducting full mission profiles from an LCS off the shore of southern California. The Navy collected effectiveness and suitability data for UISS sweep of mine surrogates in both shallow and deep fields, launch and recovery data from an LCS, and system maintenance. The Navy only conducted about half of the planned profiles in shallow water due to UISS maintenance issues and target availability.
- Cybersecurity evaluation in September 2021, including both a Cooperative Vulnerability and Penetration Assessment and an Adversarial Assessment, of surrogates for the UISS and the LCS mission package computing environment that were validated as equivalent to their low-rate production and delivered systems for the purpose of this test. The Navy conducted the assessments at the Aberdeen Test Center in Maryland.

The Navy has not conducted all planned testing, and some of the conducted tests deviated from approved DOT&E-approved test plans. Analysis is in progress to determine if the collected data are sufficient to evaluate operational effectiveness, suitability, and survivability.

Performance

Effectiveness

Analysis of the test data is ongoing, precluding the evaluation of UISS operational effectiveness at this time. The UISS demonstrated the capability to sweep mines, successfully activating the threat mines simulated in the test. The Navy did not resolve the shortfall that affects mission planning, as demonstrated in the November 2019 operational assessment.

Suitability

Analysis of the test data is ongoing, precluding the evaluation of UISS operational suitability at this time. The UISS experienced problems throughout testing that will degrade its operational suitability and effectiveness. Maintainers revealed limitations in maintainer documentation that will have to be addressed to support operational suitability. Underwater explosion testing data are not yet available to determine UISS operability following mine explosions caused by mine sweep operations.

Survivability

Analysis of the test data is ongoing, precluding survivability evaluation of the UISS in a cyber-contested environment at this time.

Recommendations

The Navy should:

1. Complete the analysis of the adequacy of executed test plans, and in coordination with DOT&E, determine the need to conduct additional tests in FY22 to close the data shortfalls required to credibly evaluate UISS operational effectiveness.
2. Address the recommendations outlined in the Controlled Unclassified Information edition of this report.