Surface Electronic Warfare Improvement Program (SEWIP) Block 2

In April 2021, the Navy completed two days of operational testing against surrogate anti-ship cruise missiles and targeting radars to evaluate the Surface Electronic Warfare Improvement Program (SEWIP) Block 2 on CVN 78. Preliminary assessment identified several shortfalls that could reduce operator situational awareness or cause unnecessary missile firings, degrading SEWIP Block 2 operational effectiveness. Preliminary results also suggest that SEWIP Block 2 does not meet its minimum threshold for system reliability. Not enough data are yet available to provide a survivability assessment of the SEWIP Block 2 in a cyber-contested environment. The Navy plans to conduct operational testing of SEWIP Block 2 on DDG 1000 and DDG 51 Arleigh Burke class with a modified Aegis Combat System in FY22.

System Description

SEWIP (AN/SLQ-32) is an electronic support system that detects, identifies, and tracks adversary anti-ship cruise missiles (ASCM) and targeting radars. SEWIP (AN/SLQ 32 V6) Block 2 incorporates a new antenna system, enhanced processing capabilities, and a High Gain High Sensitivity subsystem to improve battlefield situational awareness. SEWIP Block 2 also added a Soft Kill Coordination System to improve decoy employment and combat system soft kill integration.

Program

SEWIP Block 2 is an Acquisition Category II program that entered Milestone C in January 2013. The Navy completed SEWIP Block 2 IOT&E in 2016 and approved full-rate production in 2016. SEWIP Block II FOT&E assesses system upgrades since IOT&E, examines combat system and decoy integration capabilities of the Soft Kill Coordination System, and evaluates SEWIP Block 2 integration with the DDG 51 Arleigh Burke class and its modified Aegis Combat System, the Ship Self-Defense Combat System on CVN 78, and the Total Ship Computing Environment combat system on DDG 1000.

Major Contractor

Lockheed-Martin – Syracuse, New York.

Test Adequacy

In April 2021, the Navy completed one phase of SEWIP Block 2 FOT&E, a two-day operational test aboard CVN 78 dedicated to SEWIP Block 2 surrogate ASCM and targeting radar runs. Due to a delay in starting test and test equipment malfunctions, the Navy did not complete all planned test runs in the DOT&E-approved test plan. In addition, only two Lear aircraft were resourced to support the test, contributing to the limited data collection. Data collected during an earlier developmental test and during ASCM profiles against the Navy's self-defense test ship for CVN 78 are being evaluated to supplement operational test data. The sufficiency of these data to support the operational effectiveness and suitability of SEWIP Block 2 on CVN 78 is yet to be determined. A final assessment will be published in a classified FOT&E report for SEWIP Block 2 on CVN 78 upon completion of tests.

The Navy expects to test SEWIP Block 2 on a DDG 1000 class ship and on DDG 51 Arleigh Burke class with its modified Aegis Combat System in 3QFY22. The Navy intends to evaluate the survivability of SEWIP Block 2 on a DDG 51 Arleigh Burke class during Aegis cybersecurity testing in 1QFY23.

The Navy recently developed additional threat emulations for targeting radars and more representative stream raids. These added threat emulations, if effectively employed within the test designs, will more adequately inform system capability in the DDG 1000 and Aegis phases of the FOT&E.

SEWIP Block 2 with CVN 78 testing was limited to a subset of congested and contested electromagnetic spectrum environments due to limited CVN 78 availability to support testing, requiring future phases of test to include a more comprehensive and complex electromagnetic spectrum environment.

Performance

Effectiveness

Analysis of FOT&E data for SEWIP Block 2 on CVN 78 is in progress, precluding a final assessment of SEWIP Block 2 operational effectiveness. Preliminary assessment identified shortfalls that could reduce operator situational awareness or cause unnecessary missile firings, degrading operational effectiveness. The operational effectiveness for SEWIP Block 2 on the DDG 51 Arleigh Burke class and DDG 1000 will remain unknown until the completion of these phases of FOT&E.

Suitability

Analysis of FOT&E data for SEWIP Block 2 on CVN 78 is in progress, precluding a final assessment of SEWIP Block 2 operational suitability. Preliminary results and Fleet operational data suggest that SEWIP Block 2 does not meet its minimum threshold for system reliability.

Survivability

Not enough data are yet available to provide a survivability assessment of the SEWIP Block 2 in a cyber-contested environment. The Navy plans to evaluate the survivability of SEWIP Block 2 against the cyber threat during the DDG 51 Arleigh Burke class FOT&E test period.

Recommendations

The Navy should:

1. Continue to develop emulations for emerging threat ASCMs.
2. Ensure sufficient test time is planned for evaluating SEWIP Block 2 on DDG 1000 and DDG 51 Arleigh Burke class ships to account for unplanned test delays; the Navy should also resource four Lear aircraft to support these test events.
3. Plan and resource testing of SEWIP Block 2 with a complex electromagnetic spectrum environment for remaining test phases.