

Joint Standoff Weapon (JSOW)

Executive Summary

- The Navy accomplished additional integrated testing of the AGM-154C-1 Joint Standoff Weapon (JSOW) variant during FY14. Problems identified during FY12-13 integrated testing resulted in follow-on integrated testing in late FY14 and pushed operational testing to FY15. The JSOW C-1 operational testing is scheduled to begin in mid-FY15.
- Preliminary results to date indicate:
 - Weapon impact accuracy for moving maritime targets is well within the accuracy requirement value, and accuracy performance against stationary land targets has been maintained.
 - The JSOW C-1 Mean Flight Hours Between Operational Mission Failure (MFHBOMF) remains below the requirement value, primarily the result of software-driven problems, but is showing progress towards meeting the requirement value.
 - The pilot-vehicle interface (PVI) has improved, but there remain some minor challenges the aircrew must work around for successful mission execution.
- Testing of the implemented updates to the JSOW software to address these problems validate the use of developmental and integrated test data for DOT&E's operational evaluation of JSOW C-1.

System

- The AGM-154 JSOW family uses a common and modular weapon body capable of carrying various payloads. The JSOW is a 1,000-pound class, air-to-surface glide bomb intended to provide low observable, standoff precision engagement with launch and leave capability. All variants employ a tightly coupled GPS/Inertial Navigation System.
- AGM-154A (JSOW A) payload consists of 145 BLU-97/B combined effects submunitions.
- AGM-154C (JSOW C) utilizes an imaging infrared seeker and its payload consists of an augmenting charge and follow-through bomb that can be set to detonate both warheads simultaneously or sequentially.
- AGM-154A and AGM-154C are fielded weapons and no longer under DOT&E oversight. AGM-154C-1 (JSOW C-1)



adds moving maritime target capability and the two-way strike common weapon datalink to the baseline AGM-154C weapon.

Mission

- Combatant Commanders use JSOW A to conduct pre-planned attacks on soft point and area targets such as air defense sites, parked aircraft, airfield and port facilities, command and control antennas, stationary light vehicles, trucks, artillery, and refinery components.
- Combatant Commanders use JSOW C to conduct pre-planned attacks on point targets vulnerable to blast and fragmentation effects and point targets vulnerable to penetration such as industrial facilities, logistical systems, and hardened facilities.
- Units will use JSOW C-1 to conduct attacks against moving maritime targets and have the ability to retarget weapons post launch. JSOW C-1 will retain the JSOW C legacy capability against stationary land targets.

Major Contractor

Raytheon Company, Missile Systems – Tucson, Arizona

Activity

- The Navy conducted developmental and integrated testing in accordance with a DOT&E-approved Test and Evaluation Master Plan for the JSOW C-1.
- The Navy was scheduled to complete operational testing following the previous FY12-13 integrated testing, but it was delayed to 2QFY15 due to problems with the complicated

- PVI and integration with the F/A-18E/F H8 Operational Flight Program (OFP).
- The Navy implemented 79 software change requests, of which 34 addressed major PVI and integration problems. This activity required a change of approximately 4 percent of the

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123,000 software lines of codes in the guidance electronics unit.

- The Navy conducted nine additional integrated captive-carry tests between 1QFY14 and 4QFY14 to verify the software fixes and integration with the F/A-18E/F H10 OFP. The Navy has one free-flight test against a moving maritime target planned for 2QFY15.
- Results from the developmental and integrated testing will support an Operational Test Readiness Review (OTRR) in 2QFY15. The Navy has rescheduled JSOW C-1 operational testing for FY15 following the OTRR.

Assessment

- The Navy accomplished additional integrated testing of JSOW C-1 in FY14. Preliminary results to date indicate:
 - Weapon impact accuracy for moving maritime targets continues to be well within the accuracy requirement value and accuracy performance against stationary land targets has been maintained.
 - JSOW C-1 MFHBOMF is below the requirement value. This is primarily the result of software-driven problems. With the migration from F/A-18 H8 OFP to H10, the MFHBOMF is showing progress towards meeting the requirement value. Achieving adequate assessment of MFHBOMF during operational testing is an area of moderate risk.

- The Navy has reduced the complexity of the PVI in the F/A-18E/F H10 OFP. There remain minor PVI challenges that could prevent successful mission execution. These challenges can be effectively overcome with proper training prior to employment. This is an area of low risk during operational testing.
- Testing of the implemented updates to the JSOW software to address these problems validate the use of developmental and integrated test data for DOT&E's operational evaluation of JSOW C-1.

Recommendations

- Status of Previous Recommendations. The Navy has partially addressed the previous recommendations. The Navy has demonstrated a reduction in software-driven failures during the extended integrated testing phase. While they have significantly reduced the complex PVI, their plan will not fully address this issue until the F/A-18E/F H12 OFP release, scheduled for FY17.
- FY14 Recommendation.
 1. The Navy should continue to reduce the PVI complexity between the JSOW C-1 and the F/A-18 Super Hornet to permit successful mission execution.