

Standard Missile-6 (SM-6) Family of Missiles



In December 2021, DOT&E published an Early Fielding Report that details demonstrated performance of the Standard Missile-6 (SM-6) Block I/IA missiles with modifications provided from the Navy's future capability demonstration (FCD) mission set expansion. The Navy demonstrated additional capability in the anti-surface missions, but did not conduct operational test to determine operational effectiveness, suitability, or survivability in a contested environment. Additionally, the latest variant of the family of SM-6 missiles, the SM-6 Block IB, transitioned from a Middle Tier of Acquisition program to an Acquisition Category (ACAT) IC Major Capability Acquisition program in FY22.

SYSTEM DESCRIPTION

SM-6 is a shipborne missile that can defeat a range of targets from supersonic anti-ship cruise missiles to threat surface ships, among others. The SM-6 seeker and terminal guidance electronics derive from technology developed in the Advanced Medium-Range Air-to-Air Missile program.

SM-6 receives midcourse flight control from the Aegis Weapon System (AWS) via the ship's radar. Terminal flight control is autonomous via the missile's active seeker or is supported by the AWS via the ship's illuminator.

SM-6 consists of three primary variants: Block I, Block IA, and Block IB. Block I and Block IA were developed as a fleet area air defense weapon intended to engage anti-ship cruise missile and manned aircraft threats. The Navy upgraded the Block I and Block IA missiles to provide additional anti-surface capability through the Navy's FCD mission set expansion effort. Block IB is a modification of the Block IA missile that the Navy intends to extend engagement range through development of a new second stage rocket motor.

MISSION

The Joint Force Commander/Strike Group Commander employs naval units equipped with the SM-6 to conduct defensive and offensive operations. Missions include: 1) fleet air defense against fixed-

rotary-winged aircraft and anti-ship missiles operating at altitudes ranging from very high to sea-skimming, 2) extended range, over-the-horizon anti-surface capability, 3) overland air-defense as a component of the Navy Integrated Fire Control – Counter Air From the Sea operational concept, and 4) provide Sea-Based Terminal capability against short- and medium-range ballistic missiles in their terminal phase of flight.

PROGRAM

SM-6 is an ACAT IC program. SM-6 Block I and Block IA are beyond Milestone C. The Navy transitioned Block IB from a Middle Tier of Acquisition Program to the SM-6 ACAT IC program in November 2021. The Navy expects to deliver the Block IB missile to the fleet in FY27. The Navy is also developing an upgrade to computing components of the SM-6 family of missiles to mitigate obsolescence issues.

The SM-6 Test and Evaluation Master Plan requires an update to document the test strategy and resources to evaluate the Block IB missile. The Navy expects to provide the Test and Evaluation Master Plan update for DOT&E approval in FY23.

» MAJOR CONTRACTOR

- Raytheon Missiles & Defense – Tucson, Arizona

TEST ADEQUACY

In FY21, the Navy completed a series of land-based and at-sea developmental tests and tactical demonstrations of the additional capabilities provided the SM-6 Block I/IA missiles through the FCD effort. Data were sufficient to demonstrate additional capability within a limited set of operational conditions. Demonstrations were not intended to support a determination of operational effectiveness, suitability, or survivability in a contested environment. The Navy did not conduct operational test and did not submit operational test plans for DOT&E approval; however, the Navy included DOT&E and the Navy's Operational Test Force during test planning and test observation.

Large/full size aerial targets and representative surface targets are required to adequately test operational effectiveness, suitability, and lethality of the SM-6 Block IB. Neither are currently available nor planned for acquisition.

PERFORMANCE

» EFFECTIVENESS

The SM-6 Block I/IA missiles with FCD modifications demonstrated additional capability in anti-surface missions. In December 2021, DOT&E published an Early Fielding Report that details this performance.

SM-6 Block I/IA effectiveness in the air defense mission is unchanged from previous DOT&E assessments. SM-6 Block IB effectiveness will be reported upon completion of operational test.

» **SUITABILITY**

Insufficient data are available to determine operational suitability of the SM-6 Block I/IA missiles with FCD modifications. SM-6 Block IB suitability will be reported upon completion of operational test.

» **SURVIVABILITY**

Insufficient data are available to determine cyber survivability. Insufficient data are available to determine survivability of SM-6 with FCD modifications in a contested and congested electromagnetic environment. SM-6 Block IB survivability will be reported upon completion of operational test.

RECOMMENDATIONS

The Navy should:

1. Develop and acquire sufficient quantities of large/full size aerial targets and representative surface targets to support operational test of the SM-6 Block IB missile.
2. Conduct operational and lethality testing of the SM-6 Block I/IA with FCD modifications.