

STANDARD MISSILE-2 (SM-2)



The Standard Missile-2 (SM-2) is a solid propellant-fueled, tail-controlled SAM fired by surface ships. It was designed to counter high-speed, high-altitude anti-ship cruise missiles (ASCMs) in an advanced ECM environment. Its primary mode of target engagement uses command mid-course guidance with radar illumination of the target by the ship for missile semi-active homing during the terminal phase. The Block II version of SM-2 includes a signal processor to provide less vulnerability to ECM, an improved fuze, and focused-blast fragment warhead that provides better kill probability against smaller, harder targets, and new propulsion for higher velocities and maneuverability. The SM-2 can be used against surface targets.

A Block III version of SM-2 provides improved capability against low altitude targets. A modification to this version, designated Block IIIA, extends capability to even lower altitudes and includes a new warhead that imparts greater velocity to warhead fragments in the direction of the target. These SM-2 versions are provided as medium range (MR) rounds that can be fired from Aegis rail launchers, Aegis vertical launch systems (VLS), and Tartar rail launchers. Another MR version, designated Block IIIB, added a passive infrared seeker for an alternate guidance mode. A Block IV version was developed to provide extended range, improved cross-range, and higher altitude capability for Aegis VLS ships, as well as improved performance against maneuvering targets and complex ECM.

BACKGROUND INFORMATION

Full production approvals for SM-2 Blocks have been as follows: Block II was approved in December 1986; Block III in June 1988; Block IIIA in February 1992; and Block IIIB in September 1996. Block IV was approved for LRIP in May 1995. Further procurement was deferred, pending development of the Block IVA missile for the Navy Area Theater Ballistic Missile Defense (NATBMD) program. The Block IV program was restructured with the intention to proceed to DT&E/OT&E and support a full production decision if technical problems were encountered during development of the SM-2 Block IVA that preclude its retention of Block IV capability (never fully determined) against anti-air warfare threats. While the number of at-sea flight tests of Block IV is small, those tests have supported partial validation of the model used to predict performance.

The NATBMD program, including SM-2 Block IVA, was terminated in December 2001.

TEST & EVALUATION ACTIVITY

For both Block IIIB and Block IV, capability in various environments was investigated during flight tests conducted in conjunction with combat system ship qualification trials of Aegis ships. There was no formal T&E.

TEST & EVALUATION ASSESSMENT

Based on the 1996 OPEVAL results, DOT&E concluded that SM-2 Block IIIB is operationally effective and suitable, although there was degradation in minimum range performance. FOT&E conducted in December 1998 verified correction of the loss of minimum range performance. Further FOT&E was conducted during April 1999, demonstrating capability against an actual anti-ship cruise missile with a Block IIIB that had undergone a more representative storage period onboard a fleet ship. Additional FOT&E was conducted in July 1999 to characterize and understand the potential of fratricide in certain operational environments. Further tests, intended to characterize and understand capability in specific operational environments, will be conducted in conjunction with training events.

In view of the NATBMD program termination, it is not clear what path the Navy intends to follow in order to bring the Block IV or IVA improvements to air defense. When that is determined, T&E planning will follow. However, it is known that surrogates to represent supersonic, sea-skimming, maneuvering ASCM threats will be required for the OT&E. Currently, very few of these surrogates are available. VANDAL targets, being used for fleet training and acquisition program T&E, will be depleted by early FY03. MA-31 target availability is an uncertainty. The GQM-163A Supersonic Sea Skimming Target (SSST), currently in development, is supposed to be available in mid-2004. Further, a new ASCM threat has emerged for which there is no credible surrogate to use as a target. DOT&E has notified the Navy that it expects OT&E of air defense systems to include testing against this threat.

LFT&E is discussed in Section VI under the NATBMD report.