

## Standard Missile (SM)-6

### Executive Summary

- Standard Missile (SM)-6 Block I (BLK I) has attained Full Operational Capability; Initial Operational Capability for SM-6 BLK IA is expected in FY19.
- In FY18, the Navy completed SM-6 BLK I FOT&E testing that satisfactorily demonstrated interoperability with the Aegis Baseline 9 combat system and Integrated Fire Control capability. At the conclusion of FOT&E, SM-6 BLK I remains effective and suitable.
- Deficiencies identified in the classified May 2013 IOT&E report remain unresolved. Verification of Corrected Deficiency (VCD) events demonstrated that the software correction mitigated the effects of the deficiency but did not eliminate it. The VCD testing identified two new concerns that contributed to the deficiency not being completely eliminated:
  - A classified concern with the missile Target Detection Device
  - A classified concern with the missile active seeker
- The Navy completed live-fire operational testing of SM-6 BLK IA. The SM-6 BLK IA testing consisted of SM-6 BLK IA firings against subsonic and supersonic aerial targets and modeling and simulation (M&S) runs for the record. DOT&E will issue an FOT&E report covering this testing in FY19.

### System

- SM-6 BLK I and BLK IA are the latest evolution of the Standard Missile family of fleet air defense missiles.
- The Navy employs the SM-6 from Aegis-equipped cruisers and destroyers (i.e., *Ticonderoga*-class cruisers and *Arleigh Burke*-class destroyers).
- The SM-6 seeker and terminal guidance electronics derive from technology developed in the Advanced Medium-Range Air-to-Air Missile program.
- SM-6 retains the legacy Standard Missile semi-active radar homing capability.
- SM-6 receives midcourse flight control from the Aegis Weapon System (AWS) via ship's radar; terminal flight control is autonomous via the missile's active seeker or supported by the AWS via the ship's illuminator.
- The SM-6 BLK IA provides improved performance against advanced threats.
- SM-6 Dual I capability is fielded and provides Sea-Based Terminal Ballistic Missile Defense (BMD) capability against short-range ballistic missiles.



- The Navy upgraded the SM-6 to add an anti-surface target capability but it has not yet operationally tested the capability.

### Mission

- The Joint Force Commander/Strike Group Commander will employ naval units equipped with the SM-6:
  - For air defense against fixed-/rotary-winged targets and anti-ship missiles operating at altitudes ranging from very high to sea-skimming
  - As part of the Navy Integrated Fire Control – Counter Air From the Sea (NIFC-CA FTS) operational concept to provide extended range over-the-horizon capability against at-sea and overland threats
  - As part of the mission expansion upgrade to provide extended-range capability against surface targets
- The Joint Force Commander/Strike Group Commander will use SM-6 Dual I to provide Sea-Based Terminal capability against short- and medium-range ballistic missiles in their terminal phase of flight, anti-ship cruise missiles, and all types of aircraft.

### Major Contractor

Raytheon Missile Systems – Tucson, Arizona

# FY18 NAVY PROGRAMS

## Activity

- In FY18, the Navy conducted multiple phases of test for SM-6 in accordance with the DOT&E-approved test plans.

### SM-6 BLK I M&S FOT&E

- The Navy completed SM-6 BLK I M&S FOT&E in December 2017. These runs demonstrated SM-6 BLK I compatibility with the Aegis Baseline 9 combat system.
- DOT&E published an FOT&E report in FY18 addressing all SM-6 BLK I live fire tests and M&S tests. This report focused on SM-6 BLK I performance when employed from Aegis Baseline 9 ships.
- The Navy declared SM-6 BLK I Full Operational Capability in December 2017.

### SM-6 BLK IA Operational Testing

- The focus of SM-6 BLK IA was to demonstrate compatibility with the Aegis Baseline 9 combat system during the FOT&E.
- In August 2018, the Navy successfully completed live fire operational testing of the SM-6 BLK IA.
- The four phases of testing occurred at Point Mugu Sea Range, California, from September 2017 to August 2018 and consisted of SM-6 BLK IA firings against subsonic and supersonic aerial targets.

### SM-6 BLK IA M&S FOT&E

- The Navy plans to commence SM-6 BLK IA M&S FOT&E in FY19.

- DOT&E will publish an SM-6 BLK IA FOT&E report once SM-6 BLK IA M&S is completed.

### Naval Integrated Fire Control-Counter Air from the Sea

- The Navy conducted NIFC-CA FTS At-Sea-04 (AS-04) at the Point Mugu Sea Range in July 2018. This test employed a single SM-6 BLK I.

## Assessment

- As reported in the DOT&E FY18 SM-6 BLK I FOT&E Report, the SM-6 remains effective and suitable with the exception of the classified deficiency identified in the FY13 IOT&E Report. The SM-6 Block 1 satisfactorily demonstrated compatibility with Aegis Weapon System Baseline 9 Integrated Fire Control capability.
- In FY17-18, the Navy developed and tested specific software improvements to SM-6 BLK I to mitigate the classified performance problems discovered during IOT&E. As previously reported, testing conducted by the Navy demonstrated the software improvements perform as intended, but did not eliminate them.

## Recommendation

1. The Navy should continue to improve software based on IOT&E results and verify corrective actions with flight tests.