

## Standard Missile-6 (SM-6)

### Executive Summary

- The performance deficiency discovered during IOT&E and outlined in the classified Standard Missile-6 (SM-6) IOT&E report remains unresolved and continues to affect DOT&E's final assessment of effectiveness.
  - The Navy is assessing several options for a solution, each with varying degrees of complexity. A primary concern is to ensure the solution causes no degradation to the existing SM-6 performance envelope. The Navy plans to incorporate these changes in Block I (BLK I) and Block IA (BLK IA) production variants in FY16.
- The Navy will not demonstrate the SM-6 Capability Production Document performance requirement for interoperability until the fielding of the Navy Integrated Fire Control – Counter Air (NIFC-CA) From-the-Sea (FTS) Increment I capability in FY15. The Navy expects to demonstrate the maximum range Key Performance Parameters during SM-6 FOT&E and Aegis Baseline 9 operational testing in FY15, and the launch availability Key Performance Parameter in the FY15-16 timeframe.
- The Navy commenced developmental testing of pre-planned product improvements to the SM-6 BLK I missile; these improvements are the SM-6 BLK IA configuration. A successful, pre-production developmental flight test (Guidance Test Vehicle-1 (GTV-1)) occurred in FY14. The Navy will conduct an additional two GTV missions, one each in FY15 and FY16, with operational testing of the SM-6 BLK IA planned for FY16.
- The Navy conducted seven SM-6 missile tests during FY14; all missions were successful. Four of the launches supported FOT&E with Aegis Baseline 9, and three supported NIFC-CA FTS Increment I capability.
- NIFC-CA FTS Increment I test events have demonstrated a basic capability, but its effectiveness under operationally realistic conditions is undetermined.
- DOT&E continues to monitor the uplink/downlink antenna shroud reliability during FOT&E. There are no recorded failures in testing since IOT&E in 2011.

### System

- SM-6 is the latest evolution of the Standard Missile family of fleet air defense missiles.
- The SM-6 is employed from cruisers and destroyers equipped with Aegis combat systems.

### Activity

- The Navy conducted seven SM-6 BLK I missile tests during FY14 in accordance with a DOT&E-approved test plan; all missions were successful. Four of the launches supported



- 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 Combat System via ship's radar; terminal flight control is autonomous via the missile's active seeker or supported by the Aegis Combat System via the ship's illuminator.
- SM-6 is being upgraded to the BLK IA configuration to address hardware and software improvements and to address advanced threats

### Mission

- The Joint Force Commander/Strike Group Commander will use SM-6 for air defense against fixed-/rotary-winged targets and anti-ship missiles operating at altitudes ranging from very high to sea-skimming.
- The Joint Force Commander will use SM-6 as part of the NIFC-CA FTS operational concept to provide extended range, over-the-horizon capability against at-sea and overland threats.

### Major Contractor

Raytheon Missile Systems – Tucson, Arizona

FOT&E with Aegis Baseline 9, and three supported NIFC-CA FTS Increment I capability. While the SM-6 BLK IA test flight was a developmental test not covered under a DOT&E

operational test plan, suitability data on common components were collected.

## **SM-6 BLK I FOT&E**

- In June 2014, an SM-6 successfully engaged a high-altitude supersonic target at Point Mugu, California.
- In August 2014, an SM-6 successfully engaged a subsonic target flying at the minimum altitude overland at White Sands Missile Range, New Mexico.
- In September 2014, an SM-6 successfully engaged a low-altitude supersonic target in a crossing engagement at Point Mugu, California.
- In September 2014, an SM-6 successfully engaged a low-altitude subsonic target in a crossing engagement at Point Mugu, California.

## **NIFC-CA Increment I Flights**

- In June 2014, an SM-6 BLK I successfully engaged a subsonic low radar cross section target at medium-range and low-altitude at Point Mugu, California.
- In June 2014, an SM-6 BLK I successfully engaged a subsonic large radar cross section target at medium-range and medium-altitude at Point Mugu, California, .
- In June 2014, an SM-6 BLK I successfully engaged a subsonic large radar cross section target at long-range and medium-altitude at Point Mugu, California. This was the longest-range engagement by SM-6 to-date.

## **SM-6 BLK IA**

- In August 2014, the Navy successfully conducted a land-based test launch of the pre-production SM-6 BLK IA at White Sands Missile Range, New Mexico. The missile successfully engaged a high-altitude subsonic target overland. The Navy will conduct two additional GTV missions, one each in FY15 and FY16, the last of which will be the production configuration.

## **Assessment**

- The FY14 SM-6 BLK I flight tests were successful with no occurrences of the uplink/downlink antenna shroud reliability deficiency. DOT&E and the Navy will continue to collect data on this deficiency throughout FOT&E flight-testing. In addition, there were no observations of additional anomalies during these tests.

- In the May 2013 SM-6 IOT&E report, DOT&E assessed SM-6 BLK I as suitable. This assessment considered combined data from the IOT&E and developmental/operational flight tests. During FY14 testing, DOT&E collected additional reliability data and assessed the SM-6 BLK I continues to remain suitable. DOT&E will continue to collect suitability and effectiveness data throughout SM-6 BLK I FOT&E testing in FY14/15.
- The performance deficiency discovered during IOT&E and outlined in the classified SM-6 BLK I IOT&E report remains unresolved and continues to affect DOT&E's final assessment of effectiveness. The Navy is assessing several options for a solution, each with varying degrees of complexity. A primary concern is to ensure the solution causes no degradation to the existing SM-6 performance envelope. The corrective actions will be incorporated into production of the SM-6 BLK I and BLK IA configurations and tested during FOT&E in FY16.
- The Navy expects to demonstrate the maximum range Key Performance Parameter during SM-6 FOT&E and Aegis Baseline 9 operational testing in FY15 and the launch availability Key Performance Parameter in the FY15-16 timeframe.
- The Navy will not demonstrate the SM-6 Capability Production Document performance requirement for interoperability until the fielding of the NIFC-CA FTS Increment I capability in FY15.
- The NIFC-CA FTS Increment I demonstrations conducted during FY14 were basic developmental tests not conducted in an operationally realistic manner. The Navy plans to continue testing the Increment I configuration with increasingly-challenging scenarios; however, no operational test concept or test plans for NIFC-CA FTS increments have been provided to DOT&E.

## **Recommendations**

- Status of Previous Recommendations. The Navy has not addressed the previous recommendation to complete corrective actions of the classified performance deficiency discovered during IOT&E and develop a flight test program to test those corrective actions.
- FY14 Recommendations. None.