Rolling Airframe Missile (RAM) Block 2

Executive Summary

- The Navy's Operational Test and Evaluation Force (OPTEVFOR) completed the final IOT&E phase for the Rolling Airframe Missile (RAM) Block 2 program in March 2018 in accordance with a DOT&E-approved test plan. Testing consisted of conducting RAM Block 2 Probability of Raid Annihilation (PRA) Modeling and Simulation Test Bed runs to gather RAM Block 2 operational effectiveness data.
- DOT&E published a classified IOT&E report in September 2018. The report states that RAM Block 2 is operationally effective and suitable.

System

- The RAM, jointly developed by the United States and the Federal Republic of Germany, provides a short-range, lightweight self-defense system to defeat anti-ship cruise missiles (ASCMs). There are three RAM variants:
  - RAM Block 0 uses dual mode, passive radio frequency/infrared guidance to home in on ASCMs.
  - RAM Block 1/1A adds infrared guidance improvements to extend defenses against ASCMs that do not radiate radio frequencies.
  - RAM Block 2 incorporates changes to improve its kinematic capability and capability to guide on certain types of ASCM radio frequency threat emitters in order to defeat newer classes of ASCM threats. The warhead in Block 2 is the same as in Blocks 1 and 1A. A significant RAM Block 2 upgrade, the RAM Block 2B, is under development.
- The Navy can launch RAM Block 2 from the 21-round RAM Guided Missile Launch System resident on *San Antonio*-class amphibious transport dock ships, *America*-class amphibious assault ships, *Whidbey Island*-class and *Harpers Ferry*-class dock landing ships, *Freedom*-class littoral combat ships, and *Nimitz*-class aircraft carriers.

- RAM Block 2 is also launched from the SeaRAM standalone self-defense system, which is composed of the Close-In Weapon System radar/electronic warfare sensor suite and command/decision capability combined with an 11-round missile launcher. The SeaRAM system is resident on selected *Arleigh Burke*-class Aegis destroyers and the *Independence*-class littoral combat ships.

Mission

Commanders employ naval surface forces equipped with RAM to provide a defensive short-range, hard-kill engagement capability against ASCM threats.

Major Contractors

- Raytheon Missiles Systems – Tucson, Arizona
- RAMSys – Ottobrunn, Germany

Activity

- OPTEVFOR completed the final IOT&E phase for the RAM Block 2 program in March 2018 in accordance with a DOT&E-approved test plan. Testing consisted of conducting RAM Block 2 PRA Modeling and Simulation Test Bed runs to gather RAM Block 2 operational effectiveness data.
- DOT&E published a classified IOT&E report in September 2018.
- The Navy did not test RAM Block 2 cybersecurity during IOT&E due to a lack of test resources.

Assessment

- RAM Block 2 is operationally effective and suitable.
- Further details are contained in the classified September 2018 DOT&E IOT&E report.

Recommendations

The Navy should:

1. Resource and conduct FOT&E of RAM Block 2 cybersecurity as soon as possible.
2. Conduct FOT&E of the RAM Block 2B upgrade prior to fleet use.