

Patriot Advanced Capability (PAC)-3

Executive Summary

- The Army concluded the Patriot Post Deployment Build (PDB)-8 IOT&E in November 2017. Data from the IOT&E supported the PDB-8 fielding and Patriot Advanced Capability (PAC)-3 Missile Segment Enhancement (MSE) Full-Rate Production decisions.
- The Army conducted one Patriot Missile Flight Test (MFT) in FY18, achieving intercepts of both close-range ballistic missile (CRBM) targets.
- Patriot demonstrated interoperability with the Terminal High-Altitude Area Defense (THAAD) system in a Missile Defense Agency (MDA) tracking exercise against a CRBM target.
- DOT&E issued a classified report on the results of the PDB-8 IOT&E in April 2018.

System

- Patriot is a mobile air and missile defense system that counters missile and aircraft threats. The latest version of Patriot hardware and software is PDB-8, which consists of improvements required to:
 - Counter the evolving threat
 - Improve combat identification and the Air Defense Interrogator Mode 5 Identification, Friend or Foe capability
 - Mitigate false tracks
 - Improve electronic protection
 - Integrate further the PAC-3 MSE interceptor/ground system capabilities
- The system includes the following:
 - C-band, multi-function, phased-array radars for detecting, tracking, classifying, identifying, and discriminating targets and supporting the guidance functions
 - Battalion and battery battle management elements
 - Communications Relay Groups and Antenna Mast Groups for communicating between battery and battalion assets



- A mix of PAC-3 hit-to-kill interceptors and PAC-2 blast fragmentation warhead interceptors for negating missile and aircraft threats

Mission

Combatant Commanders use the Patriot system to defend deployed forces and critical assets from missile and aircraft attack and to defeat enemy surveillance air assets in all weather conditions.

Major Contractors

- Prime: Raytheon Company, Integrated Defense Systems – Tewksbury, Massachusetts (ground system and PAC-2 and prior generation interceptors)
- PAC-3 interceptor variants and PAC-3 Command and Launch System: Lockheed Martin Corporation, Missile and Fire Control – Grand Prairie, Texas

Activity

- The Army conducted testing in accordance with the DOT&E-approved Patriot System PDB-8 Test and Evaluation Master Plan and PDB-8 test plans and mission procedures.
- The Army conducted the PDB-8 IOT&E MFT-A2 in November 2017 at White Sands Missile Range (WSMR), New Mexico. During this test, Patriot conducted near simultaneous engagements and intercepted two CRBM targets using two mixed ripples of interceptors (PAC-3 MSE/PAC-3 Cost Reduction Initiative (CRI) and PAC-3 CRI/PAC-2

Guidance Enhanced Missile-Tactical (GEM-T)). This test was the final event in the PDB-8 IOT&E.

- DOT&E issued a classified report on the results of the PDB-8 IOT&E in April 2018.
- The MDA conducted Flight Test Other-35 (FTX-35) in April 2018 at WSMR. During this test, Patriot and THAAD tracked a CRBM target, exchanged messages over tactical datalinks, and conducted simulated engagements of the target.

Assessment

- During the PDB-8 MFT-A2, Patriot demonstrated the capability to detect, track, engage, intercept, and kill two CRBM targets using two mixed ripples of interceptors (PAC-3 MSE/PAC-3 CRI and PAC-3 CRI/PAC-2 GEM-T).
- During the MDA FTX-35 tracking exercise, Patriot demonstrated the capability to exchange track data, engagement coordination, and weapon engagement status messages with THAAD, and to detect, track, and perform a simulated engagement of a live CRBM target using two simulated PAC-3 missiles.
- Results from the PDB-8 IOT&E indicate that Patriot PDB-8 has comparable or improved effectiveness, suitability, and survivability compared with the Patriot PDB-7 system and that the PAC-3 MSE provides additional capability over previous PAC-3 missile variants, especially at higher altitudes and

longer ranges. Patriot PDB-8 suitability is similar to PDB-7 suitability, with a continuation of long-standing shortfalls in reliability and training and new problems in human-systems integration (HSI). Patriot survivability improved between PDB-7 and PDB-8, but PDB-8 still has some survivability and cybersecurity shortfalls. Details can be found in the April 2018 classified DOT&E report. Data from the PDB-8 IOT&E supported the PDB-8 fielding and MSE Full-Rate Production decisions.

Recommendation

1. The Army should fix the HSI problems identified during the PDB-8 IOT&E.