

Terminal High-Altitude Area Defense (THAAD)

Executive Summary

- The Missile Defense Agency (MDA) conducted two developmental flight tests of Patriot's ability to engage a short-range ballistic missile target using remote track and discrimination data from the Terminal High-Altitude Area Defense (THAAD) system in 2020. Both tests demonstrated THAAD's ability to provide remote track and discrimination data to Patriot.
- THAAD participated in three Ballistic Missile Defense System (BMDS) ground tests, providing information on THAAD functionality and interoperability.

System

The THAAD weapon system consists of a THAAD Fire Control and Communications (TFCC) module, an Army Navy/Transportable Radar Surveillance-2 (AN/TPY-2) Radar in Terminal Mode (TM), interceptors, launchers, and peculiar support equipment. For extended engagements, THAAD can provide or accept target tracking and discrimination data from Aegis Ballistic Missile Defense (BMD) ships or other sensors via the Command and Control, Battle Management, and Communications element. THAAD complements the upper-tier Aegis BMD and the lower-tier Patriot weapon systems.

Mission

Combatant Commanders in U.S. Indo-Pacific Command (USINDOPACOM), U.S. European Command (USEUCOM), U.S. Northern Command (USNORTHCOM), and U.S. Central Command (USCENTCOM) use the THAAD weapon system to defend deployed forces and allies from short- to intermediate-range ballistic missile threats in both the exo- and endo-atmosphere.



Major Contractors

- Prime: Lockheed Martin Corporation, Missiles and Fire Control – Dallas, Texas
- Interceptors: Lockheed Martin Corporation, Missiles and Fire Control – Troy, Alabama
- AN/TPY-2 (TM) Radar: Raytheon Company, Integrated Defense Systems – Tewksbury, Massachusetts

Activity

- The MDA conducted testing in accordance with the DOT&E-approved Integrated Master Test Plan.
- THAAD participated in three BMDS-level integrated ground tests, providing information on THAAD functionality and interoperability in regional/theater scenarios. The coronavirus (COVID-19) pandemic delayed execution of the June 2020 integrated ground test event and the February 2020 integrated ground test analysis.
- The MDA conducted Ground Test Integrated (GTI)-07c in December 2019, to examine USINDOPACOM defense using THAAD 3.2 (TH 3.2) software.
- The MDA planned to conduct GTI-20, Sprint-2 to examine USINDOPACOM defense using TH 3.2 software in March 2020, but it was delayed until June 2020 partially due to COVID-19 restrictions and partially due to Patriot model readiness.
- The Army conducted Developmental Test Flight Test Other (FTX)-39 in October 2019 using Patriot Post-Deployment Build-8.0.6 software to demonstrate a simulated engagement against a short-range ballistic missile (SRBM) to test Patriot's capability to launch on THAAD data. The Army declared FTX-39 a no-test when the test target went off course soon after launch and range safety destroyed the target prior to the THAAD radar acquiring it.
- In February 2020, the MDA examined USEUCOM and USCENTCOM defense using TH 3.2 software. COVID-19 restrictions delayed analysis results by approximately 4 months.

- The MDA and the Army conducted Flight Test Patriot Weapon System-27 Event 2 (FTP-27 E2) in February 2020 and FTP-27 Event 1 (FTP-27 E1) in October 2020 at White Sands Missile Range, New Mexico. FTP-27 E2 and FTP-27 E1 were developmental flight tests of Patriot’s ability to engage a short-range ballistic missile target using track and discrimination data from THAAD. In both tests, the THAAD battery consisted of THAAD Configuration 2 hardware, TH 3.2 software, TFCC, and an AN/TPY-2 (TM) radar.
- The MDA is planning a developmental flight test and a developmental/operational flight test in 2QFY21 with THAAD 4.0 organically integrating and firing Patriot Missile Segment Enhancement (MSE) interceptors to demonstrate initial THAAD-MSE integration.
- The MDA and the Army did not execute dedicated operational flight testing of Patriot’s ability to launch on track and discrimination data from THAAD as planned in FY20. The MDA and Army plan to conduct a developmental/operational flight test to demonstrate THAAD-MSE integration in March 2021.
- In FTP-27 E2, THAAD tracked and discriminated the target and sent the track data to Patriot over tactical networks. Patriot launched two interceptors based on THAAD data, but the interceptors failed to intercept the target. The Army determined that the missed intercept was unrelated to THAAD integration (see the Patriot article on page 221 for more details). The MDA and the Army delayed the follow-on test, FTP-27 E1, until October 2020 to allow time for FTP-27 E2 failure analysis and to verify fixes.
- In FTP-27 E1, THAAD tracked and discriminated the target and sent the track data to Patriot. Patriot launched two interceptors based on THAAD data and successfully intercepted the target.
- Developmental flight testing in FY20 did not fully address suitability shortfalls that DOT&E previously reported, including training and documentation deficiencies.

Assessment

- During integrated ground tests, the MDA demonstrated aspects of THAAD functionality in different theater scenarios to support an urgent materiel release and BMDS Increments 5B, 5C, and 6B.1. Details are classified; see the DOT&E “FY20 Assessment of the BMDS” report to be published in February 2021.

Recommendations

The MDA and the Army should:

1. Conduct dedicated operational flight testing of all new capabilities, including the Patriot launch-on-remote capability, to assess THAAD’s effectiveness, interoperability, and engagement coordination with the full BMDS architecture as it evolves.
2. Continue to improve the quality of THAAD training and documentation and incorporate their delivery to THAAD soldiers through the Army training and publication processes.