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The Terminal High Altitude Area Defense (THAAD) System

Background

According to the Department of Defense (DOD), the Terminal High Altitude Area Defense (THAAD) system **(Figure 1**) is a key element of U.S. ballistic missile defense (BMD). THAAD employs interceptor missiles, using "hit-to-kill" technology, to destroy threat missiles. Reportedly, THAAD is capable of engaging targets at ranges of 150–200 kilometers (km). THAAD covers the BMD middle tier and defends a larger area than the Patriot Air and Missile Defense System. It complements the Patriot, the Navy's AEGIS Missile Defense System, and the Ground-based Midcourse Defense System.

A THAAD battery consists of 95 soldiers, six truck mounted launchers, 48 interceptors (eight per launcher), one Army/Navy Transportable Radar Surveillance and Control Mode 2 (AN/TPY-2) radar, and a Tactical Fire Control/Communications component. THAAD provides Combatant Commanders a rapidly deployable capability against short-range (up to 1,000 km), medium-range (1,000–3,000 km), and limited intermediate-range (3,000–5,000 km) ballistic missile threats inside or outside the atmosphere during their final (terminal) phase of flight. THAAD was developed by Lockheed Martin Corporation, headquartered in Bethesda, MD, and is being manufactured in Troy, AL. The Missile Defense Agency (MDA) is responsible for the development of THAAD. According to the MDA,

> MDA is responsible for the sustainment of the THAAD missile defense unique and development items, while the U.S. Army is responsible for the operations and sustainment of the common items. MDA funding provides sustainment for all fielded THAAD batteries, ensures THAAD assets are properly maintained and crews are trained to meet Combatant Commanders' needs.

The Army provides soldiers for THAAD units. As such, the ability to field and operate THAAD batteries can be affected by recruiting and retention shortages, as well as the availability of qualified critical technical military occupational specialties.

The Army currently has seven THAAD batteries. The first THAAD battery (A Battery, 4th Air Defense Artillery Regiment, 11th Air Defense Artillery Brigade) was activated in May 2008 at Fort Bliss, TX, and the seventh THAAD battery was activated in December 2016. According to 2019's *Army Air and Missile Defense 2028*, three THAAD batteries are based at Fort Bliss, two batteries are based at Fort Cavazos, TX, and one battery is based in South Korea and one in Guam.

Figure 1.THAAD Fire Unit

Source: U.S. Indo-Pacific Command News, https://www.pacom.mil/Media/News/Article/707735/missile-system-would-greatly-increase-defense-capability-in-south-korea/, accessed April 16, 2024.

Brief History of the THAAD Program

According to the Center for Strategic and International Studies (CSIS) Missile Defense Project, the Army began developing THAAD in 1992. In December 1995, the Army attempted its first THAAD intercept test, which was unsuccessful. Five successive test flights—taking place from 1996 to 1999—also failed. The Army redesigned THAAD and relaxed requirements for intercepting targets at lower altitudes. Between 2006 and 2019, the Army and the MDA conducted 18 THAAD intercept tests. Fourteen of the tests were successful, and four were cancelled prior to launch due to target malfunctions.

Current THAAD Program Activities

The FY2021 National Defense Authorization Act (NDAA) (P.L. 116-283) authorized and funded the procurement of an eighth THAAD battery. On April 21, 2022, Lockheed Martin received a contract totaling $74 million to produce the THAAD battery for the MDA, expected to be fielded by 2025. According to the MDA, as of January 2024, the eighth THAAD battery was still in production. As of October 1, 2023, the MDA had delivered 799 operational THAAD interceptors to the U.S. Army and Foreign Military Sales (FMS) customers.

THAAD Overseas Deployments

THAAD has been deployed on a number of occasions in response to potential ballistic missile threats. According to an April 2013 *Federal Register* notice

> The U.S. Secretary of Defense directed the Army to deploy a THAAD battery immediately to Guam on an emergency basis in response to potential North Korean missile launch activity. Since the temporary deployment of the THAAD battery in 2013, DOD validated the enduring requirement for a THAAD battery in Guam to ensure continued defense of the

> homeland against existing and emerging missile threats by potentially hostile states in the region.

Stars and Stripes reported in May 2022 that the Army would relocate the THAAD battery on Guam from Andersen Air Force Base, Guam, to the nearby Marine Corps base, Camp Blaz, Guam, which is currently under construction. The Guam-based THAAD unit is designated as Task Force Talon, Echo Battery, 3rd Air Defense Artillery of the Army's 38th Air Defense Artillery Brigade.

South Korea

On July 7, 2016, the U.S. and South Korean governments decided to deploy a THAAD battery to U.S. Forces Korea as a defensive measure designed to ensure the security of South Korea and to protect alliance military forces from North Korea's use of weapons of mass destruction and conventional ballistic missile threats. The THAAD battery is stationed at a South Korean military base in Seongju, about 130 miles south of Seoul.

Europe and the Middle East

THAAD has also been deployed outside the Indo-Pacific region. According to CSIS

> In April 2019, the United States temporarily deployed THAAD to Deveselu, Romania while its Aegis Ashore system received maintenance. Following drone and missile attacks on Saudi oil facilities, the United States deployed a THAAD battery to Saudi Arabia in October 2019. This system was withdrawn in mid-2021.

2023 Middle East Deployment

On October 21, 2023, the Secretary of Defense directed the deployment of a THAAD battery, as well as additional Patriot battalions, to locations throughout the region to increase force protection for U.S. forces, bolster regional deterrence efforts, and assist in the defense of Israel. According to a report, the THAAD battery deployed in 2023 and supporting Patriot units remain in the region.

United States Deploys THAAD to Israel

On October 13, 2024 the Department of Defense announced,

> At the direction of the President, Secretary Austin authorized the deployment of a Terminal High-Altitude Area Defense (THAAD) battery and associated crew of U.S. military personnel to Israel to help bolster Israel's air defenses following Iran's unprecedented attacks against Israel on April 13 and again on October 1. The THAAD Battery will augment Israel's integrated air defense system. This action underscores the United States' ironclad commitment to the defense of Israel, and to defend Americans in Israel, from any further ballistic missile attacks by Iran. It is part of the broader adjustments the U.S. military has made in recent months, to support the defense of Israel and protect Americans from attacks by Iran and Iranian-aligned militias.

FY2025 THAAD Budget Request

For FY2025, the MDA requested

> $732 million to continue the development of THAAD system builds to increase interceptor capability and weapon system performance to address the current and evolving threat, to include significant improvements which will provide the capability to counter more advanced threats; procure 12 THAAD interceptors; and begin initial engineering efforts supporting integration of the THAAD weapon system into the Army Integrated Air and Missile Defense Battle Command System (IBCS) architecture.

THAAD Foreign Military Sales (FMS)

Other nations have acquired or intend to acquire the THAAD system. According to the MDA, as of January 2024

- Two THAAD batteries had been delivered to the United Arab Emirates and are fully operational. The UAE's THAAD successfully intercepted Houthi militant ballistic missiles in January 2022, marking THAAD's first operational intercept in a combat environment by any nation.
- Saudi Arabia has signed multiple FMS cases for delivery of seven THAAD batteries and supporting equipment.

Potential Congressional Oversight Consideration

Adequacy of Current THAAD Force Structure

At present the Army has seven Active Duty THAAD batteries and plans to have an eighth Active Component THAAD battery fielded by 2025. Two batteries are committed on a long-term basis to Guam and South Korea, and a battery deployed to the Middle East in 2023 reportedly remains in the region. With the October 2024 THAAD deployment to Israel, over half of the Army's seven THAAD batteries are now deployed on operations, leaving the remaining three batteries for contingency operations or as potential rotational replacements for currently deployed THAAD batteries.

Given the open-ended operational commitment of over half of the Army's THAAD force, Congress might decide to examine the adequacy of Army THAAD force structure and assess if it would be practical to create THAAD units in the Army National Guard. With Army officials acknowledging that "the air defense and artillery communities have some of the Army's highest operations tempo" and stating "it [THAAD] is the Army's most deployed formation," Congress could examine the operational tempo (OPTEMPO) and stress on Army air defense soldiers in order to determine if the current pace of operations is sustainable over the long term and what measures might be undertaken to reduce OPTEMPO and stress on THAAD units and soldiers.

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