



INTEGRATED AIR & MISSILE DEFENSE

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Combatting the Multi-Domain Challenge

AN OVERVIEW OF THE MISSILE DEFENSE AGENCY'S 2020 BUDGET REQUEST

We've entered a new era of missile defense. On August 2, 2019, the U.S. officially exited the Intermediate-Range Nuclear Forces (INF) Treaty, which banned the United States and Russia from fielding land-based missiles with a range between 500 and 5,500 kilometers, has completely disintegrated. Russia and China are rapidly developing advanced weaponry, such as hypersonics, that could potentially render our existing missile defense operations obsolete within the next 3 years. And, last but not least, more nations and non-state actors have access to nuclear technology than ever before.

With those challenges in mind, the Missile Defense Agency will be investing a total of **\$9.431 billion in FY2020** "to develop and deploy a layered Ballistic Missile Defense System to defend the United States, its deployed forces, allies, and friends from missile attacks of all ranges and in all phases of flight." This represents a \$1.06 billion decrease from the FY 2019 enacted budget of \$10.491 billion and, according to many experts, **ultimately this year's budget fails to provide sufficient funding for many of the priorities outlined in the administration's 2019 Missile Defense Review** such as:

A Space-Based Sensor Layer

Volume Kill Capability Development

Adaptation Of The Current Interceptor Families Or New Interceptor Development To Counter More Advanced Missile Threats

Low-Power Laser Demonstrator

Instead, as in FY19, the MDA plans to focus on increasing the reliability and the robustness of the current systems over the course of FY20. To shed light on the administration's current approach to IAMD, below is an outline of where the funding is going and a list of recent program updates.

\$1.5 Billion Towards Overall Procurement

42% decrease from FY19

THAAD

\$425.9 Million

Includes 37 THAAD interceptors, obsolescence mitigation, production and training support, and procurement of tooling and equipment for the THAAD stockpile reliability and recertification program.

AEGIS

\$697.8 Million

The request covers **30 SM-3 Block IB** and **7 SM-3 Block IIA missiles**. The request provides a five-year Multiyear Procurement, for SM-3 Block IB missiles ending in FY 2023. Also includes:

- **\$124.9M** for Aegis BMD weapon systems consisting of Aegis shipset equipment, software, and installation materials.
- **\$25.7M** for the Aegis Ashore site in Poland.

Maneuver-Short Range Air Defense (M-SHORAD)

\$39.1M

Represents the first investment of a total of **\$262M** for the HORAD system that mounts multiple different air defense interceptors on a modified Stryker combat vehicle.

GMD Procurement

\$9.5M

Funds the mitigation of GBI obsolescence-driven redesign and testing in support of GBI procurements.

\$7.4 Billion Towards RDT&E

9% increase from FY19.

Ground-based Midcourse Defense (GMD)

\$1.2 Billion

Supports the development and expansion of long-range homeland missile defense capabilities. Under this funding umbrella, MDA continues the efforts to field 20 additional GBIs equipped with the Redesignated Kill Vehicle, 20 silos in Missile Field 4 in Fort Greely, Alaska, and two additional silos in Missile Field 1.

Aegis BMD

\$727.5M

The program includes the integration of the SM-3 Block IIA into the Aegis BMD weapon system, transition of the Kinetic Warhead hardware commonality effort to system integration testing, and pre-production of all-up-rounds to support initial deployment.

Lower Tier Air and Missile Defense Sensor (LTAMDS)

\$428M

This capability will provide the required sensing capabilities within the lower tier portion of the ballistic missile defense battlespace. The LTAMDS expands PAC-3 Missile Segment Enhancement (MSE) battlespace, acts as a sensor node on the IAMD network, addresses critical capability gaps, modernizes technology, reduces operating and sustainment (O&S) costs, mitigates obsolescence, and increases reliability & maintainability (R&M).

Improved Homeland Defense Interceptors

\$412.4 Million

Includes research and development for the Redesignated Kill Vehicle (RKV) program.

Technology Maturation Initiatives

\$303.5M

Will demonstrate sensor capabilities against ballistic targets and advanced threats to improve tracking performance and operational utility.

- Includes **\$34M** for a Neutral Particle Beam (NPB) program designed to develop a "space-based, directed energy capability for homeland defense, providing a defense for boost phase and mid-course phase." A total of \$369M is expected to be invested into this program from 2020-2023.

BMD Terminal Defense

\$302.8M

THAAD development and integration will provide enhanced debris mitigation capability and, improved interoperability with other BMDS elements, expand defended areas via remote operation of THAAD Launchers, and initiate development efforts to utilize the Terminal Mode radar to report hypersonic threats to the BMDS.

Home Defense Radar – Hawaii (HDR-H)

\$274.7M

The HDR-H will provide a persistent capability, augmented by other sensors, to mitigate the effects of evolving threats to the BMDS, optimize discrimination capability in the Pacific

BMD Sensors

\$263.5M

To provide periodic software updates for the AN/TPY-2, COBRA DANE, Sea-Based X-Band, and UEWR radars to counter evolving threats, and to develop future radar capabilities through system engineering, software development, and testing.

Hypersonic Defense

\$157.4

To develop near term sensor and command and control capability upgrades for defense from hypersonic threats.

Long Range Discrimination Radar (LRDR)

\$136.4M

In FY20, MDA will complete assembly and installation of the LRDR and conduct system integration and power-up testing at Clear Air Force Station, AK.BMD Sensors

Space and Near-Space Activities

\$63.4

Includes \$35.8 for the Space Tracking and Surveillance System (STSS) and \$27.6M for the BMD Space Program. Will fund the Spacebased Kill Assessment (SKA) experiment, which uses a network of fast frame rate and infrared sensors based on commercial satellites to deliver an experimental kill assessment capability tailored to homeland defense.

The MDA's Top Unfunded Priorities

\$108M

for hypersonic and ballistic tracking space sensors, known as the Space Sensor Layer (SSL)

\$720M

for Hypersonic Defense Acceleration

On August 30, 2019, it was announced that the U.S. Army had successfully tested their new **Terminal High Altitude Area Defense** system (THAAD). Using a remotely-located THAAD launcher, the Army was able to successfully intercept and destroy a medium-range ballistic missile. This represents a significant milestone in proving the ability to remotely engage the system with a government-developed remote launcher kit.

On August 21, 2019, the Pentagon officially canceled Boeing's \$1 Billion "Kill Vehicle" Contract due to problems with the "kill-vehicle" payload on interceptor missiles. The Defense Department plans start a competition for a new contract to design a next-generation interceptor defense and say they don't expect the problems to delay the planned expansion of the Ground-based Midcourse Defense (GMD) system from 44 to 64 interceptors in the coming years.

According to **Defense News**, the Army is nearing a decision on who will build its Lower-Tier Air-and-Missile Defense Sensor (LTAMDS) which will provide the sensing capability for the future Integrated Air-and-Missile Defense System the service is developing. The service is planning to award a contract no later than the end of the fiscal year to one of the three vendors (Raytheon, Northrop Grumman and Lockheed Martin) that participated in a "sense-off" competition at White Sands Missile Range, NM this past spring. The radar is part of a new AMD system that will replace the Army's Raytheon-made Patriot system.

On August 29, 2019, the U.S. Army collaborated with Lockheed Martin (NYSE: LMT) and Northrop Grumman (NYSE: NOC) on a flight test aimed to demonstrate the performance of a missile defense system against intercept air-breathing threats. The team successfully deployed the LRDR Cost Reduction Initiative interceptor, the Northrop-built Integrated Air and Missile Defense Battle Command System and an integrated fire control network equipped with multiple sensors. The test marked the furthest distance a PAC-3 CRI missile has intercepted an ABT while integrated with the Army Integrated Air and Missile Defense (AIAMD) Battle Command System (IBCS) leveraging multiple sensors on the Integrated Fire Control Network (IFCN).

On August 6, 2019, Lockheed Martin announced that the F-35 joint strike fighter demonstrated its ability to send data to the U.S. Army's Integrated Air and Missile Defense Battle Command System during the Orange Flag Evaluation 19-2 at Palmdale, California, and Fort Bliss, Texas, in June. The capability is seen as important in multidomain operations because it would be able to detect threats that are tough for ground-based sensors alone to pick up.

On August 2, 2019, less than three months after awarding a \$130 million contract to build a 100-kilowatt laser, the Army announced their plans to skip the 100 kW weapon and go straight for a much more powerful one in the 250-300 kW range. This new 250-300 kW weapon, called HEL-IFPC is expected to enter service in 2024. As to what will happen to the \$130 contract awarded to Dynetics and Lockheed this past May to develop the 100 kW laser that remains unclear.

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A GLIMPSE INTO THE 2019 SPEAKER LINE-UP



Dr. Michael D. Griffin
Under Secretary of
Defense for
Research and
Engineering
DoD



General James M. "Mike" Holmes
Commander, Air
Combat Command
USAF



Lieutenant General James H. Dickinson
Commander, Joint
Functional Component
Command for
Integrated Missile
Defense
USSTRATCOM



Lieutenant General John F. Thompson
Commander, Space
and Missile Systems
Center
USAF



Major General Sean Gainey
Deputy Director for
Force Protection, J-8
US Joint Staff



Rear Admiral Tom Druggan
Program Executive,
Aegis Ballistic Missile
Defense
Missile Defense
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