



MISSILE DEFENSE AGENCY

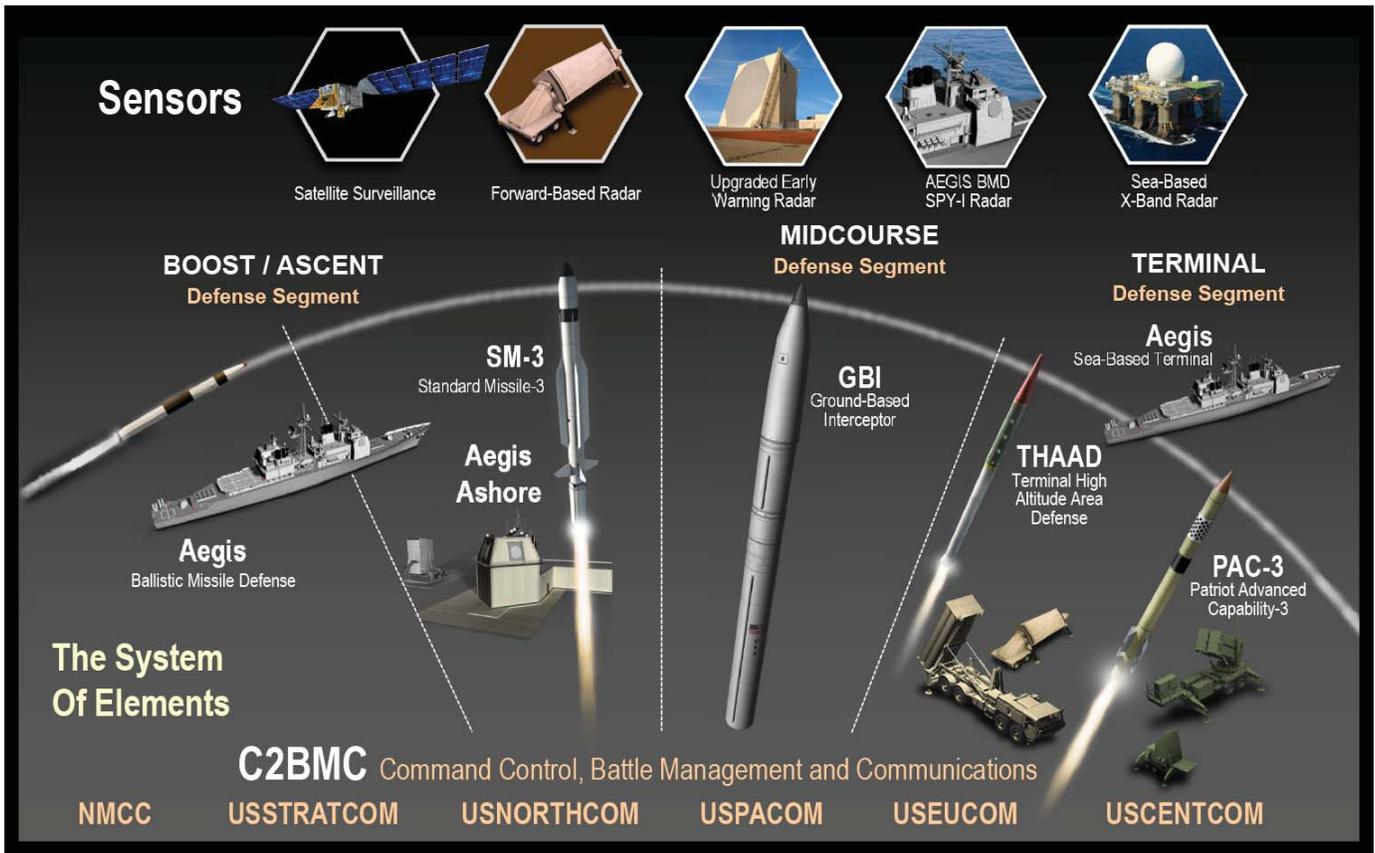
Fiscal Year (FY) 2018 Budget Estimates

OVERVIEW



Missile Defense Agency (MDA) Fiscal Year 2018 Budget Overview

The Missile Defense Agency (MDA) requests \$7.9 billion in Fiscal Year (FY) 2018, an increase of \$379 million from the FY 2017 budget request, to strengthen and expand the deployment of defenses for our Nation, deployed forces, allies, and international partners against increasingly capable ballistic missiles. The FY 2018 missile defense program will continue to support the Warfighter and needs of the Combatant Commanders with the development, testing, deployment, and integration of interceptors, sensors, and the command, control, battle management and communications (C2BMC) system for the Ballistic Missile Defense System (BMDS). The FY 2018 budget continues to preserve homeland and regional missile defense priorities and invests in advanced technology development and future capabilities to counter the proliferation of increasingly complex threats. MDA is very cognizant of the growing cyber threat and is aggressively working to ensure the Nations missile defenses are resilient and able to operate in a highly contested environment. We are working with the Services, the Combatant Commanders, and other agencies in DoD and our partners in the Federal Government to counter this growing threat.



The Ballistic Missile Defense System

The following discussion provides a summary of highlights of the major Program Elements, but does not necessarily examine all funding and activities included within each Program Element.

I. HOMELAND DEFENSE

With this budget request, MDA remains committed to operating, sustaining, expanding and improving our nation's homeland missile defenses. We propose continuing the development, testing, operations and sustainment of the GMD weapon system. PB18 request includes:

- \$828.1 million for the Ground-based Midcourse Defense (GMD) (PE0603882C). MDA continues the development and expansion of long-range GMD capabilities with 32 currently deployed Ground-Based Interceptors (GBIs) at Fort Greely, Alaska (FGA), and four GBIs at Vandenberg Air Force Base (VAFB) in California. MDA will complete deployment of eight additional GBIs in Alaska by the end of 2017, for a total of 44 GBIs to improve protection against North Korean and potential Iranian ICBM threats as they emerge. MDA will replace aging ground system infrastructure and fire control and kill vehicle (KV) software to improve discrimination capabilities.



Ground Based Interceptor Emplacement
Fort Greely, Alaska

- \$465.5 million for Improved Homeland Defense Interceptors (PE 0604874C) to continue the development of the GMD Redesigned Kill Vehicle (RKV). The RKV will address the evolving threat, enhance kill vehicle reliability, and improve in-flight communications to better utilize off-board sensor data. MDA will complete All-Up-Round (AUR) Preliminary Design and Critical Design and support development of the first RKV flight test (CTV-03) to demonstrate RKV integration and performance in flight test. MDA will continue AUR systems engineering to support the testing and fielding of RKV and C1, C2, and C3 booster equipped interceptors. MDA will continue development of alternative seeker for the redesigned kill vehicle until after the RKV Critical Design Review (CDR). We anticipate deploying the RKV beginning in the 2022 timeframe.

- \$76.8 million for Ground-based Midcourse Defense Test (PE0604887C) in support of the Integrated Master Test Plan (IMTP). PB18 also includes the first GMD operational flight test, FTG-11, a Salvo intercept using GBIs launched from Vandenberg Air Force Base, California (VAFB). This intercept test will exercise firing doctrine against an ICBM target with associated objects



Ground Based Interceptor Emplacement
Vandenberg AFB, California

that will be launched from Reagan Test Site (RTS). MDA will also initiate planning for range and data collection assets for Flight Test GM-Controlled Test Vehicle-03 (GM CTV-03), a non-intercept flight characterization mission with RKV to collect RKV flight environment data using a GBI launched from VAFB.

- \$137.9 million for the Operation and Maintenance (O&M) of the GMD weapon system. This includes operation, maintenance and sustainment of the GMD weapon system and operational and support facilities at FGA and VAFB. It also includes Warfighter training, wargames, and exercises to improve readiness.

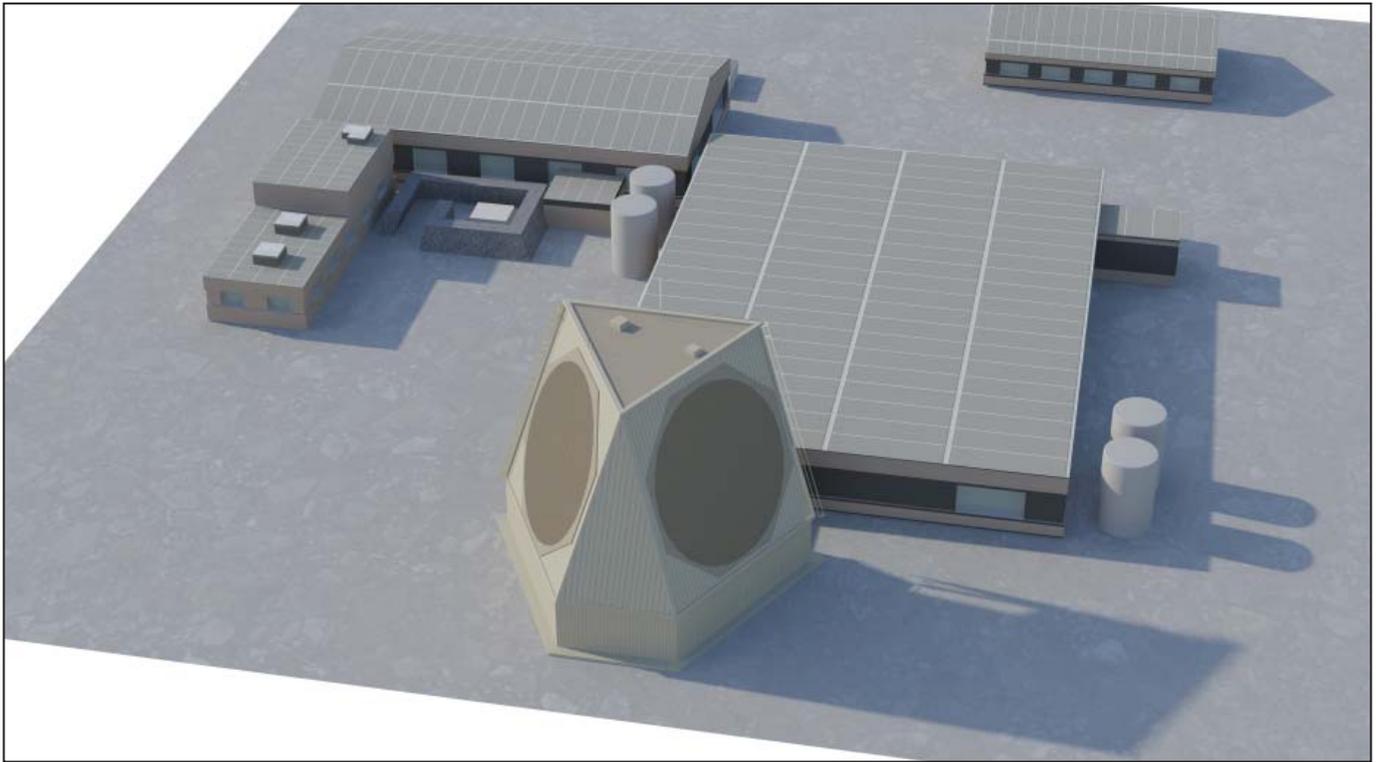
MDA requests \$130.7 million for the Sea-Based X-band (SBX) radar (PE 0603907C). The SBX radar provides precision midcourse tracking debris mitigation, and discrimination capabilities. The SBX continues to participate in flight tests. The budget request includes funds to extend on-station time from 120 days at sea to 330 days to expand contingency operations for defense of the homeland at the request of the U.S. Pacific Command (USPACOM) and U.S. Northern Command (USNORTHCOM). MDA continues the SBX East Coast siting study tasked by the FY 2016 NDAA with emphasis on existing DoD facilities to minimize cost of infrastructure and security. The study is on track for reporting not later than 31 December 2018. Initial site screening has been completed, and site visits and evaluation are planned for 2nd and 3rd quarter FY 2017, with environmental documentation for the highest rated sites to begin later in FY 2017.

The budget requests \$357.7 million for the Long Range Discrimination Radar (LRDR) (PE 0604873C). The LRDR is a midcourse sensor that will improve BMDS target discrimination capability while supporting a more efficient utilization of the GMD interceptor inventory. In FY 2018, MDA will complete the design and purchase



Sea-Based X-band (SBX) Radar

critical radar antenna components. MDA will also initiate qualification and sub-system testing for the LRDR.



Long Range Discrimination Radar (*Concept*)

The LRDR site will be constructed as two separate military construction (MILCON) projects. Phase 1 (\$155 million, FY 2017) funded a Shielded Mission Control Facility and Radar Foundation. MDA began military construction of Phase 1 in FY 2017. Phase 2 (\$150 million, FY 2019) funds the shielded Power Plant that includes fuel storage, a maintenance facility, and associated site support, beginning in FY 2019.

MDA requests \$21 million (PE 0603884C, Budget Project MD41) in FY 2018 for Homeland Defense Radar – Hawaii (HDR-H) to conduct source selection activities. This radar will provide a persistent capability, augmented by other sensors to mitigate the effects of the evolving threats to the BMDS, optimize discrimination capability in the Pacific architecture, and increase the defensive capability of GBIs for the enhanced defense of Hawaii. MDA plans to compete and award a Pacific Radar contract in FY 2018 and deliver an initial capability by FY 2023.

II. REGIONAL DEFENSE

The FY 2018 President’s Budget also reflects the Department’s commitment to building regional missile defense forces that are interoperable with systems deployed by international partners. We continue to execute the European Phased Adaptive Approach (EPAA) designed to protect U.S. deployed forces and NATO allies in Europe from ballistic missile attacks from the Middle East. At the July 2016 Warsaw Summit, NATO Heads of State and Government declared the

achievement of NATO BMD Initial Operational Capability. The NATO declaration highlights the U.S. work to field EPAA as our voluntary contribution to NATO BMD.

MDA successfully delivered EPAA Phase 2, which includes the Aegis Ashore site in Deveselu, Romania, in December 2015. This site, operationally certified by the Navy, houses the first

operational land-based Aegis BMD weapon system with the capability to launch Standard Missile (SM)-3 Block IAs and IBs to protect European NATO allies and deployed U.S. forces in Europe. The U.S. Navy will continue to operate the Aegis Ashore site in Romania as an integral part of NATO's BMD architecture, which includes a forward-based Army Navy/Transportable Radar Surveillance System (AN/TPY-2) in Turkey, BMD-capable Aegis Destroyers homeported in Rota, Spain, SM-3 interceptors, and a command-and-control node operated from Ramstein Air Base, Germany.



Aegis Ashore Deckhouse
Deveselu, Romania



Aegis Ashore
Poland

EPAA Phase 3 is scheduled to be delivered by the end of CY 2018. It will consist of an Aegis Ashore site in Poland, and an upgraded version of the Aegis BMD weapon system with a new SM-3 variant, the Block IIA. Aegis Ashore site construction in Poland began in FY 2016 and MDA will complete construction by the end of CY 2018. For EPAA Phase 3, Aegis Ashore sites and upgraded Aegis BMD ships will be capable of launching SM-3

Block IA, IB, and IIA, variants providing improved defensive coverage against short-, medium-, and intermediate-range threats. MDA requests \$59.7 million in FY 2018 procurement funds for Aegis Ashore in Poland. The funding addresses the multiple actions required to field the Aegis Ashore end item in Poland by the end of the calendar year 2018, keep the individual components up to date with the Navy's destroyer modernization plan, and install modifications as required to enhance co-existence with Broadband Wireless Access systems in the European theater.

We propose continuing the development, testing, operations and sustainment of the Aegis BMD Program. PB18 request includes:

- \$852.1 million in for Aegis BMD (PE 0603892C). This includes the integration of the SM-3 Block IIA into the BMD Weapon Systems, transition of Kinetic Warhead hardware commonality effort to system integration testing, and pre-production All-Up-Rounds to support the initial deployment for EPAA Phase 3. MDA is strongly committed to increase the Aegis Weapon System in alignment with Navy requirements to increase performance against SRBM, MRBM, and IRBM ballistic threats. Utilizing improved radar discrimination, Aegis will increase capability against longer range and more sophisticated threats. In FY18, MDA continues software development for Integrated Air and Missile Defense (IAMD) Baseline 9.C2 (BMD 5.1) in support of EPAA Phase 3 and the IAMD Baseline 10 (BMD 6.0). The BMD 6.0 Computer Upgrade will integrate BMD capability with the Advanced Air and Missile Defense Radar (AMDR) data, also known as the AN/SPY-6, for remote engagements and increased raid capacity with simultaneous multi-mission capabilities. Beginning in FY 2018, MDA will commence upgrades on the SM-3 Block IB hardware and software to leverage the capability of the SM-3 Block IIA.



Standard Missile-3 Launch

- \$134.5 million for Aegis Testing (PE 0604878C). Aegis BMD Flight Test Program performs comprehensive testing of Aegis BMD components and demonstrates their interoperability with the BMDS. Using accredited Modeling & Simulation (M&S) the ground test program provides the evidence required for the MDA and Combatant Commanders to transition the capability to the Operational Capacity Baseline. MDA plans to conduct Flight Test Standard Missile (FTM-29) and (FTO)-03 Events 1 and 2 using Aegis BMD Weapon System 5.1 and the SM-3 Block IIA missiles. These development and operational tests support the U.S. Navy certifications as well as EPAA commitments. MDA also plans to conduct Flight Test Experimental Advanced Technology -01 (FEV-01). The FEV-01 is an experimental demonstration of an Aegis BMD ship engagement of a MRBM target by an SM-3 Block IB missile using Launch on Remote (LoR) based on Discrimination Sensor Technology (DST) data provided by Reapers equipped with Multi-Spectral Targeting System, Type C (MTS-C).

- MDA requests a total \$624.1 million in procurement for Aegis BMD, which plays a critical role in both homeland and regional defense. MDA is requesting \$425.0 million to procure 34 Aegis SM-3 Block IB missiles in FY 2018, along with associated hardware and support costs. A total of 287 SM-3 Block IB missiles will be procured and 182 delivered to the Fleet by the end of FY 2018. MDA requests \$38.7 million for advance procurement for long lead materials associated with the FY 2018- 22 SM-3 Block IB missile buy to ensure timely delivery to the

Combatant Commander. The procurement budget also requests \$160.3 million for Aegis BMD Weapon Systems consisting of, Aegis shipset equipment, software and installation materials. MDA will continue to deliver SM-3 Block IBs to the Navy for deployment on land at the Aegis Ashore site in Romania and at sea on multi-mission Aegis ships with BMD capability. MDA is continuing work with the U.S. Navy on AN/SPY-1 radar antenna improvements which, when coupled with the appropriate Aegis Weapon System computer program, will increase radar detection sensitivity. The preliminary requirements and design for the AN/SPY-1 refurbishment are complete, including full-scale tests to demonstrate tracking capability against live targets. MDA and the Navy plan to field the refurbished antennas onboard selected Aegis DDG Flight I and II ships starting in the FY 2022 timeframe.

- \$96.3 million of Operation and Maintenance (O&M) funding for the Aegis BMD program to perform missile recertification, repair efforts, demilitarization, and Ordnance Assessment/Surveillance. This funding supports BMD Computer Program, Ship Equipment, and Aegis Ashore - Romania sustainment, as well as Fleet integration support.

Terminal High Altitude Area Defense (THAAD) is a transportable, ground-based missile defense system that defends against regional ballistic missiles in the terminal stage of flight. THAAD provides Combatant Commanders a rapidly deployable capability to deepen, extend, and complement BMDS homeland and regional defenses. MDA supports forward-deployment of one THAAD battery in Guam. Recent provocations further demonstrate the serious threat North Korea poses to the Republic of Korea (ROK), the Asia-Pacific region, and our forward deployed forces. U.S. Pacific Command re-stationed the first elements of the THAAD system to the Republic of Korea (ROK) on March 6, 2017 implementing the U.S.-ROK Alliance's July 2016 decision to bring the defense capability to the peninsula. The deployment of THAAD contributes to a layered missile defense system and enhances the U.S.-ROK Alliance's defense against North Korean missile threats. PB18 request includes:



THAAD Deploying
Republic of Korea

- \$230.2 million for BMD Terminal Defense (PE 0603881C), THAAD development efforts. MDA will continue development of THAAD software upgrades such as implementation of flexible threat packages and defense planning, improved capability to engage SRBM, MRBM and limited IRBM threats, and integration of the THAAD battery capability into the Integrated Air and Missile Defense Battle Command System (IBCS) planning process.

- \$36.2 million for Terminal Defense Testing (PE 0604876C). In FY 2018, THAAD will conduct Flight Test Other-35 (FTX-35), a ballistic missile tracking test to prove THAAD software build 3.0 and test X86 AN/TPY-2 radar configuration with a THAAD Battery. THAAD will participate in Flight Test Other -36 (FTX-36), a ballistic missile tracking test, to demonstrate interoperability between THAAD and PATRIOT. THAAD will also begin pre-mission planning for (FTO-03 E2) to be executed in FY 2019.
- \$451.6 million to continue procurement of THAAD equipment, including 34 THAAD interceptors in FY 2018. By the end of FY 2018, MDA will deliver 52 additional THAAD interceptors to the U.S. Army, for a total of 210 interceptors delivered. MDA received an incremental production decision in the 4th Quarter FY2016 for THAAD authorizing continued production of at least 79 additional interceptors through FY 2020.
- \$78.8 million of Operations and Maintenance (O&M) funding to support the maintenance and upkeep of all BMDS unique items of the fielded THAAD batteries as well as for all THAAD training devices. In FY 2018 MDA will provide support to seven THAAD batteries.

III. DEVELOPING NEW CAPABILITIES

MDA is developing advanced BMD technologies that can be integrated into the BMDS to adapt to future threat changes. The investment strategy for these technologies balances the need to address the most dangerous current threats with the need to position the U.S. to respond to threat developments in the future. Areas for technology investment include: persistent discrimination in the current and future BMDS sensor architecture; high power lasers; Multi- Object Kill Vehicle (MOKV) technology and other advanced technology for high-risk/high-pay off breakthroughs.

The advanced technology investments are informed by capability gap assessments and focus on concepts that bring upgraded capability to the Warfighter. The goal is to provide capabilities that enable the future BMDS to keep pace with new and evolving threats.



Solid-State Laser



**Reaper With
Multispectral Targeting System**

MDA requests \$128.4 million for Technology Maturation Initiatives (PE 0604115C) to build on the foundational successes in Weapons Technology and Discrimination Sensor Technology. MDA will integrate an advanced sensor into the tactically proven Multispectral Targeting System and MQ-9 Reaper combination to address precision track and discrimination performance of this technology with the goal of eventually migrating to a space sensor layer. MDA will continue the design and begin fabrication of a UAV-borne laser for boost phase missile defense. Adding a boost phase layer



Multi-Object Kill Vehicle (*Notional Concept*)

of sensors and weapons to the missile defense architecture could increase the performance and effectiveness of the BMDS.

MDA requests \$252.9 million for the Common Kill Vehicle Technology Program (PE 0603294C) to establish the technology foundation for killing multiple lethal objects from a single interceptor. MDA is on contract with three major primes for a three year, competitive program to reduce the technical risk for MOKV product development beginning

late calendar year 2020. Note: In FY 2018, funding for MOKV Risk Reduction is requested in the Common Kill Vehicle Technology program element 0603294C. MOKV Development is requested in the MOKV program element 0604894C.

MDA requests \$20.2 million for the Advanced Research Program (PE 0603180C) to conduct innovative research and development with small businesses, universities, and international partners to create and advance future missile defense capability. MDA continues to capitalize on the creativity and innovation of the nation’s small business community and academia to enhance the BMDS.

MDA also requests \$13.0 million for the Advanced Concepts & Performance Assessment effort (PE 0603176C), which centralizes advanced technology concept modeling, simulation, and performance analysis and delivers independent assessments of government, university, and industry technology concepts that, along with systems engineering requirements, support acquisition strategy decisions and define our technology focus areas. The request will fund the digital simulation and hardware-in-the-loop infrastructure required for testing of an airborne advanced sensor, Kill Vehicle Modular Open Architecture testbed, pre- and post-mission performance predictions and assessments, and mature related tracking, discrimination, and sensor fusion algorithms.



Modeling and Simulation

IV. SPACE

MDA requests \$17.0 million in the BMD Space program (PE 1206895C,) for the Spacebased Kill Assessment (SKA) experiment. SKA will use a network of fast frame rate and infrared sensors



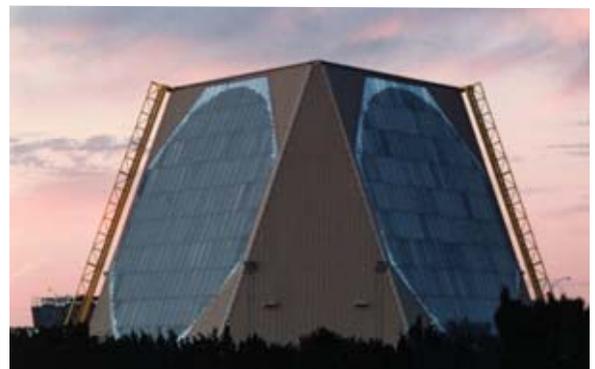
Space-based Kill Assessment Sensor

hosted on commercial satellites to deliver an experimental kill assessment capability tailored to homeland defense. The full SKA network is currently planned to be on orbit in FY 2017. This request also supports development of kill assessment algorithms required to add SKA to the operational BMDS. MDA also requests \$34.9 million for Space Tracking and Surveillance System (STSS) satellite operations and sustainment (PE 1206893C). STSS consists of two satellites operating in Low Earth Orbit and provides risk reduction data for a potential operational BMDS

tracking and surveillance constellation in the areas of sensor management, target signatures, discrimination, and fire control loop closure. STSS will continue participating in MDA test events and data collections providing battlespace awareness, technical intelligence, and space situational awareness to the Warfighter. This request also funds the Missile Defense Space Center (MDSC), which provides a collaborative environment to exploit and integrate STSS and other national security space assets for ballistic missile defense. MDA is also funding the implementation of a Post Intercept Assessment (PIA) capability that will include a PIA database and display. Note: The Department has created a new Major Force Program (MFP) 12 to more clearly identify space programs. These new PE's have been fully transferred from PE 0603895C, and PE 0603893C respectively beginning in FY 2018 but are not new starts.

V. OTHER PROGRAM HIGHLIGHTS

BMD Sensors (PE 0603884C) along with the accompanying O&M, supports both homeland and regional defense missions. For homeland defense, MDA requests \$191.1 million to sustain Cobra Dane, the Upgraded Early Warning Radars (UEWR), and the AN/TPY-2 radars. The Services and Combatant Commands, with logistical support from MDA, operate AN/TPY-2 (Forward Based Mode) radars in Japan (two radars), Israel, Turkey, and United States



Upgraded Early Warning Radar

Central Command (USCENTCOM) in support of regional defense. MDA continues to support the AN/TPY-2 radar (Terminal Mode) as part of a forward deployed THAAD battery in Guam.



Cobra Dane Radar

MDA requests \$213.5 million to develop advanced discrimination algorithms for the AN/TPY-2, Cobra Dane, Sea Based X-Band, and the UWR radars to counter evolving threats. The discrimination improvement effort will develop and field integrated Element capabilities to improve BMDS ability to discriminate between lethal and non-lethal objects. In FY 2018, MDA will transition to production of next generation Gallium Nitride (GaN) Transmit/Receive Integrated Multichannel Modules (TRIMMs) to support the AN/TPY-2 sparing strategy and improve radar performance. \$10 million is budgeted for Gallium Nitride transition. Additionally, MDA plans \$5 million for an Atlantic Radar study to assess the feasibility of long-range discrimination radar or other appropriate tracking and discrimination sensor capabilities in a location optimized to support the defense of the United States against emerging long-range ballistic missile threats from Iran. MDA request \$84.2 million for BMD Sensors testing activities (PE 0604879C) for planning, analysis and execution of BMDS flight test events, including pre- and post-test efforts such as Digital and Hardware-in-the-Loop (HWIL) Pre-Mission Tests (PMTs) and Post-Flight Reconstruction (PFR). Sensors Test also provides planning, analysis and execution for BMD System level ground tests identified in the Integrated Master Test Plan (IMTP).

C2BMC (PE 0603896C) provides persistent tracking, cueing, discrimination and fire control quality data to Aegis BMD, GMD, THAAD, and PATRIOT systems and coalition partners to support homeland and regional missile defense objectives. C2BMC also provides sensor control and management of AN/TPY-2 (Forward-Based Mode) radars worldwide to support homeland and regional missile defense and provides the warfighter tools for BMDS situational awareness and decision making. MDA requests \$430.1 million to sustain the current C2BMC global capability (Spiral 6.4) and complete development and fielding of enhanced tracking, discrimination, and battle management capability to support homeland and regional missile defense in 2018 (Spiral 8.2-1). MDA will continue development of sensor management and tracking improvements to enable Aegis BMD Engage on Remote capability (Spiral 8.2-3) and integration of the LRDR to support homeland defense engagements (Spiral 8.2-5). C2BMC upgrades in 2018 will enhance current C2BMC capability, integrate new space sensors, and enable sustainment of C2BMC global capability. Development activities for Aegis BMD Engage on Remote will provide a five-fold increase in defended area via critical sensor management and track reporting improvements

and enhanced space sensor support. MDA continues development of C2BMC control and management of LRDR and enhanced track and discrimination reporting to GMD in support of homeland defense.



Global Engagement Manager Console at the Missile Defense Integration and Operations Center
Colorado Springs, Colorado

MDA requests \$200.2 million to perform the systems engineering required to design, build, test, assess and field the integrated BMDS (PE 0603890C, Budget Projects MD24, and MD31). BMD System-level engineering and integration ensures the delivery of new capabilities to defeat the evolving threat, enables interoperability between U.S. forces and international partners, and drives future capability development from a system perspective to maximize the effectiveness of BMD technologies. In FY 2018, MDA will complete the engineering and technical assessment that underpins the EPAA Phase 3 Technical Capability Declaration (TCD). The TCD will provide confidence to the Warfighter that the Aegis Ashore site in Poland will operate as designed. MDA employs BMD System and element-level models and simulations to verify BMDS performance and assess BMDS capability to engage and defeat complex threats across a spectrum of scenarios that cannot be demonstrated in flight tests. As a result, MDA is able to deliver to the Warfighter evolving, integrated, and layered BMDS performance and capabilities that have been thoroughly assessed and validated through testing and Modeling and Simulation. In this budget cycle, MDA is pursuing improvements to both System-level digital simulation and integrated System-level ground test simulations. Beginning in FY 2018, MDA will initiate an Aegis Ashore (AA) Air and Missile Self Defense Study. The study will provide recommendations on capabilities to protect AA sites from air and missile attacks.

In FY 2018, MDA will increase Hypersonic Defense systems engineering activities, technology demonstrations, and risk reduction, as a continuation of FY 2017 Department of Defense efforts to address weapons technologies to defeat advanced threats. Activities will include completion of a Defense against Hypersonic Threats AoA, capability roadmap development, and initial investment in sensor technology demonstrations and weapon concepts to address the advanced threat. MDA will leverage existing sensors and ground infrastructure/Command and Control



Hypersonic Glide Vehicle

to quickly demonstrate and deploy a three-phase limited contingency capability to provide real-time warning over the majority of the hypersonic threat profile by 2019. MDA is requesting \$75.3 million for Hypersonic Defense activities in FY 2018, (PE 0604181C).

MDA's budget request puts a priority on cybersecurity operations. MDA will train, educate, develop and grow MDA's cybersecurity workforce to support the mission. These efforts reflect a commitment to make a fundamental shift in our cybersecurity culture by improving human performance and accountability in support of the DoD Cyber Strategy and comply with the DoD Cybersecurity Discipline Implementation Plan. The MDA Cyber Operations Program is vital to the operational development of the BMDS and the MDA Research, Development and Test missions. The program has several initiatives, including Computer Network Defense (CND), Certification and Accreditation (C&A) activities, and Computer Emergency Response Teams (CERT). The MDA Cyber Operations Program is part of a multi-tiered CND capability that quickly adapts to near-term changes, continuously evolves to meet long-range threat and technology trends, and unites all missile defense elements under the coordination and direction of a single lead organization, United States Cyber Command, to conduct multi-component and defense-wide CND operations. The information security framework will be integrated into the agency infrastructure to connect MDA systems around the world.

MDA, in conjunction with IMTP stakeholders, plans and executes a fully integrated test program that synchronizes the system under test with the Warfighters trained to operate the system under varying wartime conditions against current and emerging threats. For flight testing, the Agency incorporates the nine (9) operational realism criteria as defined by the Ballistic Missile Defense System Response to National Defense Authorization Act Section 234, for Fiscal Year 2005, Increasing Operational Realism. Thirty-one (31) of the seventy-four (74) flight tests in the BMDS Test Program are currently planned to achieve these criteria. For system-level ground testing, all tests culminate in operational testing with Warfighters on console and independent operational assessments by the BMDS Operational Test Agency Team.



Cybersecurity

This ensures that BMDS capabilities are credibly demonstrated and validated prior to delivery to the Warfighter.



Standard Missile-3



Terminal High Altitude Area Defense

MDA works collaboratively with the Director, Operational Test & Evaluation; Deputy Assistant Secretary of Defense, Developmental Test and Evaluation; Commander, Joint Functional Component Command for Integrated Missile Defense; Service Operational Test Agencies and the Joint Interoperability Test Command to identify and incorporate all testing requirements into development of the IMTP, a comprehensive, highly integrated, complex, cost-effective series of flight tests, ground tests, wargames, and exercises.

MDA continues to support and expand work with international partners to include conducting joint analyses to support missile defense acquisition decisions, cooperative research and development projects, deployments, and co-production. MDA requests \$9.7 million to complete Aegis SM-3 Block IIA Cooperative Development Program (PE 0604881C). This is a cooperative effort between the U.S. Department of Defense and the Japan Ministry of Defense. SM-3 Block IIA development builds upon established joint research investments by the United States and Japan. MDA is committed to delivering the SM-3 Block IIA to the Fleet to meet global threat requirements and support EPAA Phase 3.

This budget continues MDA's longstanding support of U.S.-Israeli Cooperative BMD Programs, to include the co-development of the David's Sling Weapon System, Upper Tier Interceptor, and Arrow Weapon System Improvements. MDA works with the Israeli Missile Defense Organization on these programs in accordance with jointly signed international agreements.

VI. SUMMARY

MDA requests \$7.9 billion in FY 2018 to strengthen and expand the deployment of defenses for our Nation, deployed forces, allies, and international partners against increasingly capable ballistic missiles.