2018 Congressional Breakfast Seminar Series

By: Lieutenant General Samuel A. Greaves, USAF
Director
Missile Defense Agency
June 26, 2018

Approved for Public Release
18-MDA-9675 (5 June 2018)
Today’s Realities

POTUS, 23 August 2017: “We are committed to expanding and improving a state of the art missile defense system to shoot down missiles in flight. And we are getting better and better at it. It’s actually incredible what’s taking place.”

SECDEF statement, 20 September 2017: "...if we fail to adapt at the speed of relevance, our forces will lose...“

CJCS, 3 October 2017: "Based on the current capacity of the North Korean threat, both the type and the amount of missiles that they possess, we can protect Hawaii today against an ICBM. We can protect the continental United States against an ICBM... As the capacity of the threat increases - that is the size, not just the lethality, of missiles that they may possess - we need to be concerned about ensuring that our ballistic missile defense capability keeps pace with that threat. We do think an increase is warranted.“

USD (AT&L), 10 October 2017: “It’s all about velocity. We are trying to get stuff downrange quickly.”

POTUS, 22 December 2017: POTUS designates funding for MDA’s FY18 Budget Amendment Missile Defeat and Defense Enhancement effort as “emergency requirements.”

USD (R&E), 13 April 2018: “We have become a process-driven acquisition structure…We can either keep our process-driven structure, or our technical preeminence…we cannot have both.”

The Time for Delays and Studies and Objections Is Over...The Threat Has Voted and Continues to Visibly Vote
Missile Defense Agency Mission

To develop and deploy a layered Ballistic Missile Defense System to defend the United States, its deployed forces, allies, and friends from ballistic missile attacks of all ranges and in all phases of flight.

Missile Defense Capability Globally Deployed
Missile Defense Agency Priorities
- In Support Of The National Defense Strategy -

• Continue focus on increasing system reliability to build warfighter confidence

• Increase engagement capability and capacity

• Rapidly address the Advanced Threat

BMDS Meets Today’s Threat but Requires Additional Capacity and Advanced Capability to Stay Ahead of the Evolving Threat
USD(R&E) Priorities and MDA Focus Areas

Research and Engineering
Ten Broad Priorities / Focus Areas

1. **Fully Connected Mesh Network** – Joint Command, Control, Battle Management and Communications across the force structure

2. **Space** – Both offense and defense – space is a warfighting domain and we need to build systems with that in mind

3. **Missile Defense** – Hypersonic threat = “a new urgency we haven’t seen since the Cold War” that demands a different style of thinking about our architecture

4. **Cybersecurity** – Offense and defense

5. **Nuclear Modernization** – Both weapons and carrier vehicles

6. **Directed Energy / Non-Kinetic** – Includes more than lasers (particle beams and high power microwaves)

7. **Artificial Intelligence / Machine Learning**

8. **Microelectronics** – Strategic Resourcing, we cannot be dependent on getting critical microelectronics from other countries

9. **Quantum Science**

10. **Conventional Prompt Strike** (Hypersonics)

---

Missile Defense Agency
Focus Areas

1. **Defense Against Hypersonics**

2. **Boost Phase Defense**

3. **Directed Energy Development**

4. **Artificial Intelligence / Machine Learning / Big Data Exploitation**
Today’s Ballistic Missile Defense System

C2BMC Command Control, Battle Management and Communications

NMCC USSTRATCOM USNORTHCOM USINDOPACOM USEUCOM USCENTCOM

BOOST / ASCENT Defense Segment

Aegis
Ballistic Missile Defense

SM-3 Standard Missile-3

GBI Ground-Based Interceptor

MIDCOURSE Defense Segment

Aegis Ashore

Aegis
Sea-Based Terminal

THAAD Terminal High Altitude Area Defense

TERMINAL Defense Segment

PAC-3 Patriot Advanced Capability-3

The System Of Elements

Sensors

Satellite Surveillance
Forward-Based Radar
Upgraded Early Warning Radar
AEGIS BMD SPY-I Radar
Sea-Based X-Band Radar

Approved for Public Release 18-MDA-9675 (5 June 2018)
MDA Defense Strategy

Inventory – Increase Reliability and Capacity

Reduce Salvo Size & Expand Capability of Existing System

Sensor Coverage
- LRDR, HDR, Pacific Radar, Atlantic Radar, Airborne EO/IR

Adding an Aegis Layer to GMD

Space Sensor Layers

Multiple Kill Vehicles
- Multiple objects per interceptor

Boost Phase Kill
- High Energy Lasers/Directed Energy
  - Kinetic Weapons

Hypersonic Vehicle Defense

Potential Space-Based Interceptor

Increasing Capability

Approved for Public Release 18-MDA-9675 (5 June 2018)
An operational space layer is an integral part of a robust and resilient Ballistic Missile Defense sensor architecture.
Key BMDS Planned Flight Tests
FY18 - FY20

Operational Testing

FTO-03 E1 & E2
- 1st operational test of the BMDS EPAA Phase 3 architecture
- 1st regional/theatre operational test of the BMDS Increment 5 architecture

Aegis Ballistic Missile Defense

FTM-45, FTX-23, FTM-44, & FTM-30
- SM-3 Blk IIA return to flight: engagement of MRBM
- Data collection event against MRBM w/ countermeasures
- 2018 NDAA: SM-3 Blk IIA capability testing
- SM-3 Blk IIA engagement of MRBM w/ countermeasures

Aegis Sea-Based Terminal

FTM-31, -32, & -33
- 1st & 2nd SM-6 Dual II salvo engagement of MRBMs
- 1st Multiple Simultaneous Engagement of SRBMs

Ground-based Midcourse Defense

FTG-11 & GM CTV-03+
- 1st GBI salvo engagement of ICBM
- 1st Test of the Redesigned Kill Vehicle

International Testing

Terminal High Altitude Area Defense

FTT-23
- THAAD engagement demonstrating Remote Launcher

Arrow & David’s Sling Weapon System
- Continuing co-development with Israel

FTP-21
- Interoperability demonstration with Patriot

JFTM-5
- Japanese demonstration using the SM-3 Blk IB

Approved for Public Release 18-MDA-9675 (5 June 2018)
Developing, Delivering, and Sustaining Ballistic Missile Defense
People, Processes, and Products

REAL WORLD DATA COLLECTION AND THREAT OBSERVATION

WARFIGHTER INVOLVEMENT IN PRIORITIES & CAPABILITIES

JROCM CAPABILITIES DOCUMENT FOR HOMELAND BMD

SERVICES

COLLABORATION WITH INTELLIGENCE COMMUNITY

THREAT ENGINEERING

TECHNOLOGY DEVELOPMENT

PRODUCT DEVELOPMENT

TESTING

PRODUCTION

SYSTEMS ENGINEERING PROCESS AND PRODUCTS

Plan | Define | BMDS System Design | Element Design & Build | Test & Verify | Assess | Deliver
--- | --- | --- | --- | --- | --- | ---
- National Security Strategy
- Warfighter Prioritized Capability List
- Adversary Capability Document
- Capability Planning Specification
- BMD System Description Document
- Modeling & Simulation
- Systems Requirements
- Adversary Data Package
- BMD System Specification
- M&S Simulation Conceptual Model
- BMD System Interface Control Document
- Element Capability Specifications
- Integrated Master Test Plan
- Integrated M&S Master Plan
- System Assessment Reports
- Integrated Master Assessment Plan
- Technical Capability Declaration
- Operational Capacity Baseline

Approved for Public Release
18-MDA-9675 (5 June 2018)
International Cooperation

**Asia / Pacific**
- THAAD deployment to ROK
- U.S.-Japan SM-3 IIA Program
- Homeland Defense radar – Pacific
- Aegis Ashore FMS to Japan

**Europe**
- NATO BMD
- European Phased Adaptive Approach (EPAA) Phase 3
- Formidable Shield-17/19
- Joint Analysis Activities

**Middle East**
- UAE THAAD FMS Execution
- Israeli Programs Cooperative Development, Testing & Coproduction
- THAAD FMS to Kingdom of Saudi Arabia

Approved for Public Release
18-MDA-9675  (5 June 2018)
Summary – MDA Priorities
- In Support of the National Defense Strategy -

- Continue focus on increasing system reliability to build warfighter confidence

- Increase engagement capability and capacity

- Rapidly address the Advanced Threat

BMDS Meets Today’s Threat but Requires Additional Capacity and Advanced Capability to Stay Ahead of the Evolving Threat