2018 Congressional Breakfast Seminar Series

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Director
Missile Defense Agency
June 26, 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

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 -

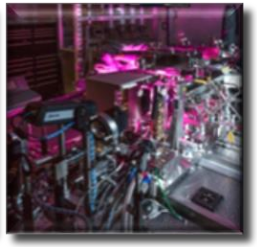
- **Continue focus on increasing system reliability to build warfighter confidence**
- **Increase engagement capability and capacity**
- **Rapidly address the Advanced Threat**












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

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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**

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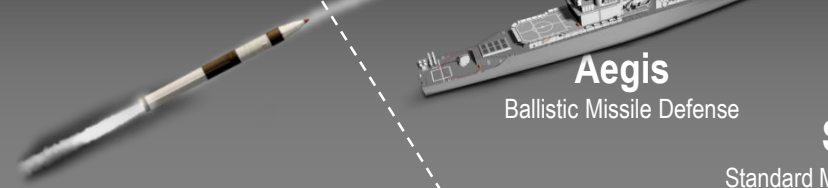
Today's Ballistic Missile Defense System

C2BMC Command Control, Battle Management and Communications

NMCC USSTRATCOM USNORTHCOM USINDOPACOM USEUCOM USCENTCOM

The System Of Elements

BOOST / ASCENT Defense Segment

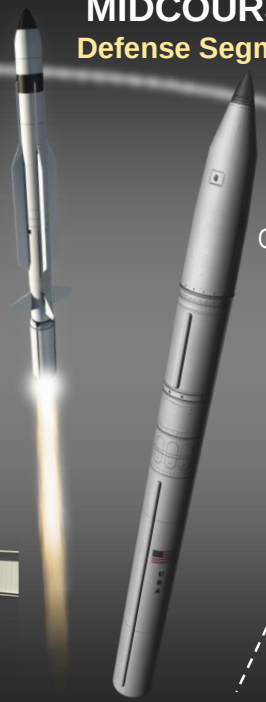


Aegis
Ballistic Missile Defense

SM-3
Standard Missile-3

Aegis Ashore

MIDCOURSE Defense Segment



GBI
Ground-Based Interceptor

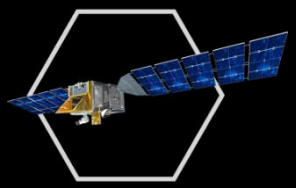
TERMINAL Defense Segment

Aegis
Sea-Based Terminal

THAAD
Terminal High Altitude Area Defense

PAC-3
Patriot Advanced Capability-3

Sensors



Satellite Surveillance

Forward-Based Radar

Upgraded Early Warning Radar

AEGIS BMD SPY-I Radar

Sea-Based X-Band Radar

HQ-G-0371-18

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

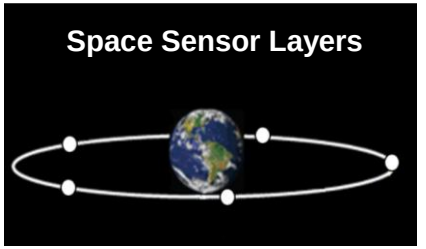
Boost Phase Kill
- High Energy Lasers/Directed Energy
- Kinetic Weapons

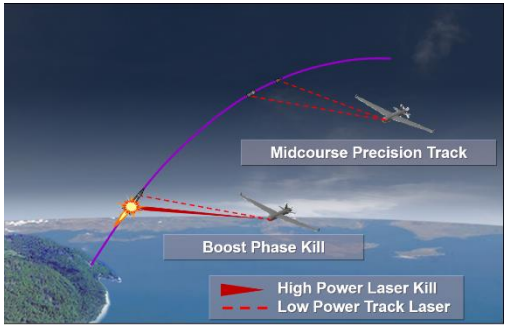
Hypersonic Vehicle Defense

Potential Space-Based Interceptor

Improving Cost Effectiveness versus Complex Threats

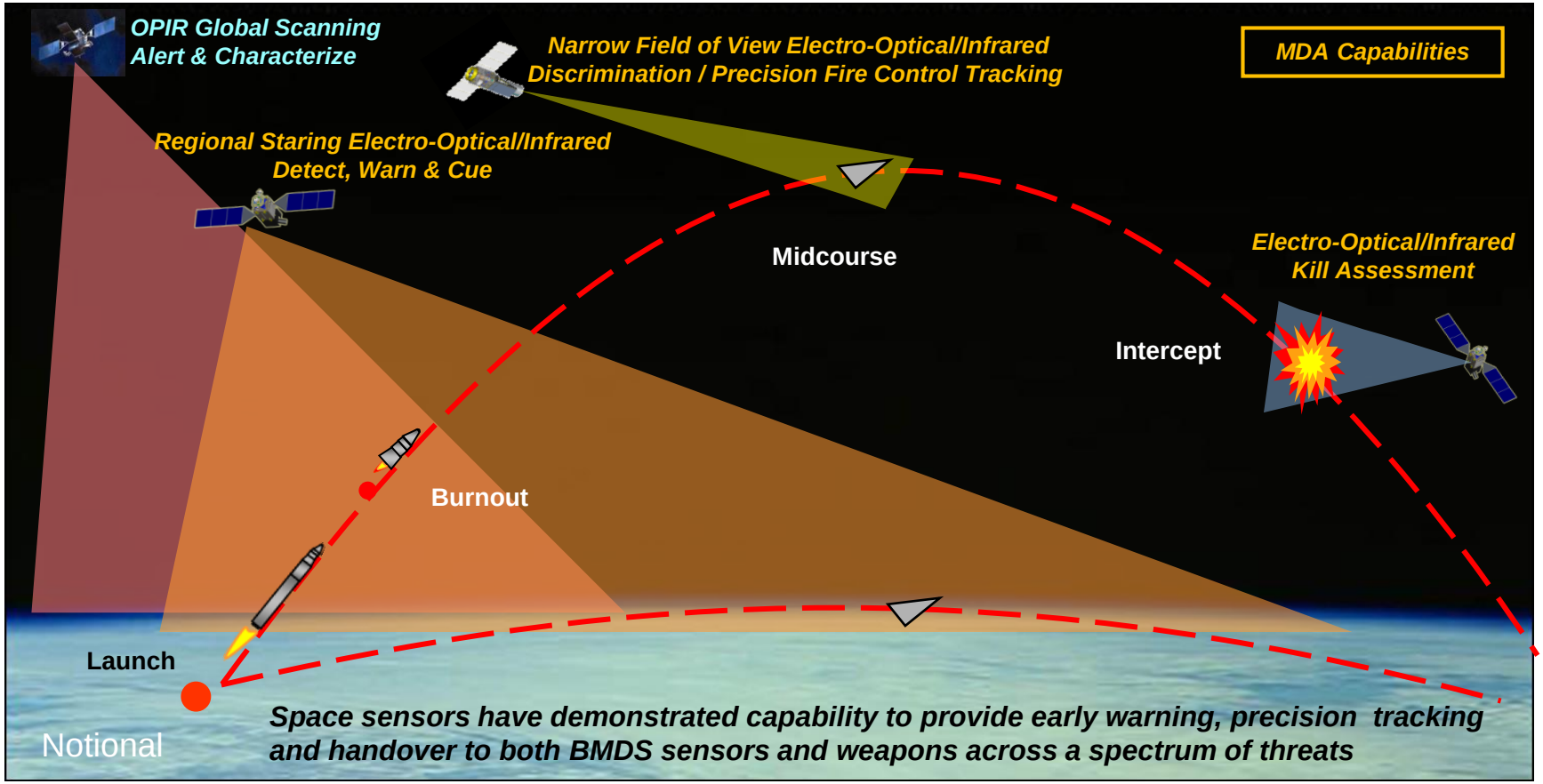
Multi-Domain System Integration into C2BMC





Increasing Capability

BMDS Space Sensor Vision



OPIR – Overhead Persistent Infrared

An operational space layer is an integral part of a robust and resilient Ballistic Missile Defense sensor architecture

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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

Ground-based Midcourse Defense

FTG-11 & GM CTV-03+

- 1st GBI salvo engagement of ICBM
- 1st Test of the Redesigned Kill Vehicle

Terminal High Altitude Area Defense

FTT-23

- THAAD engagement demonstrating Remote Launcher

FTP-21

- Interoperability demonstration with Patriot

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

International Testing

Arrow & David's Sling Weapon System

- Continuing co-development with Israel

JFTM-5

- Japanese demonstration using the SM-3 Blk IB

Developing, Delivering, and Sustaining Ballistic Missile Defense

People, Processes, and Products

REAL WORLD DATA COLLECTION AND THREAT OBSERVATION

COLLABORATION WITH INTELLIGENCE COMMUNITY

THREAT ENGINEERING

WARFIGHTER INVOLVEMENT IN PRIORITIES & CAPABILITIES

SERVICES

JROCM CAPABILITIES DOCUMENT FOR HOMELAND BMD

TECHNOLOGY DEVELOPMENT

Airborne Sensor

Focal Plane

Multi Object Kill Vehicle

Space-Based Kill Assessment

Directed Energy

PRODUCT DEVELOPMENT

Command & Control

GMD

THAAD

Aegis BMD

TESTING

THAAD

Aegis BMD

GMD

GMD Test

PRODUCTION

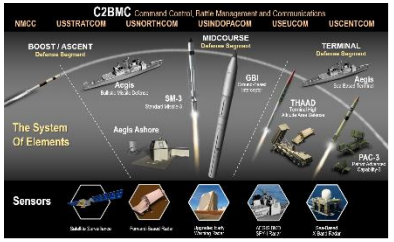
GMD

Aegis Ashore

THAAD Interceptor

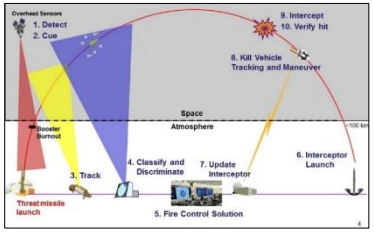
Standard Missile (SM-3) BLK IIA

DEPLOYED BALLISTIC MISSILE DEFENSE SYSTEM



OPERATIONS AND SUSTAINMENT

10 STEPS TO MISSILE INTERCEPT



CONGRESS
DEFENSE INDUSTRY
INTERNATIONAL PARTNERS
EXTERNAL INTEREST
PRESS / PUBLIC

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	• Integrated Master Assessment Plan • System Assessment Reports	• Technical Capability Declaration • Operational Capacity Baseline

Warfighter Request for Analysis and Request for Information

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International Cooperation

Asia / Pacific

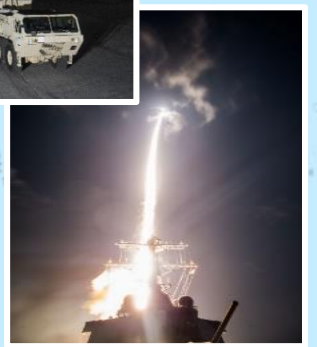
- THAAD deployment to ROK
- U.S.-Japan SM-3 IIA Program
- Homeland Defense radar – Pacific
- Aegis Ashore FMS to Japan

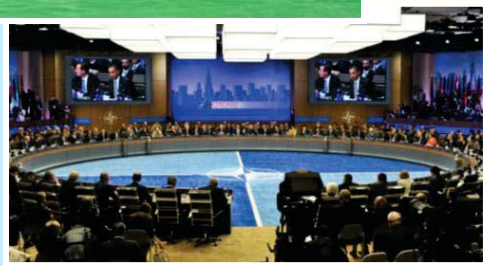
Europe

- 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





Engagement / Outreach	Missile Defense Analysis	Cooperative Missile Defense Projects	Co-development	Co-production	Deployment

Summary – MDA Priorities
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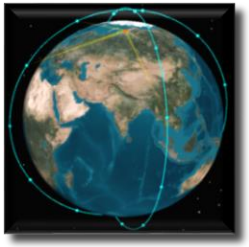
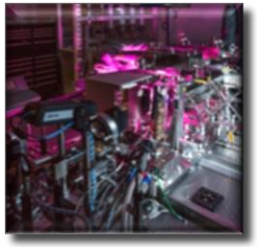
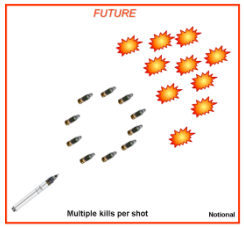

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