



2020

Missile Defense Agency
Office of Small Business Programs
Virtual Conference

Missile Defense Agency Small Business Programs Conference Ground Sensors Directorate Overview



To: MDA Small Business Program Conference

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Missile Defense Evolving Threat Environment

Adversaries are fielding diverse and expansive ranges of modern offensive missile systems

- Developing new missiles & improving existing systems
 - Precision strike
 - Penetration aids (e.g. decoys, jamming devices)
- Capable of maneuvering in midcourse or terminal phase
 - Maneuvering Reentry Vehicle (MaRV)
 - Multiple Independent Reentry Vehicle (MIRV)
 - Hypersonic glide vehicles and cruise missiles



North Korea
Hwasong-15 ICBM



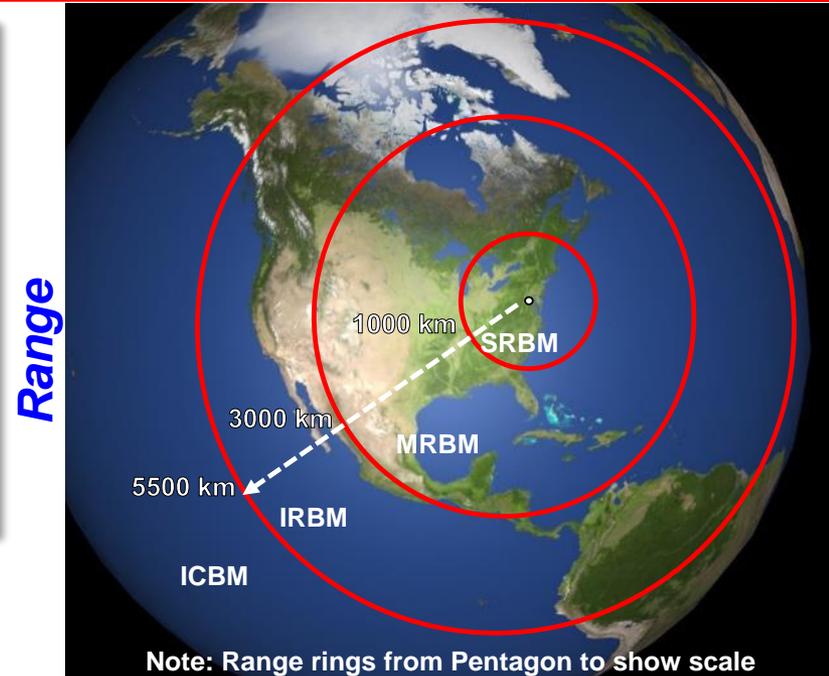
Iran
Emad-1 MRBM with MaRV



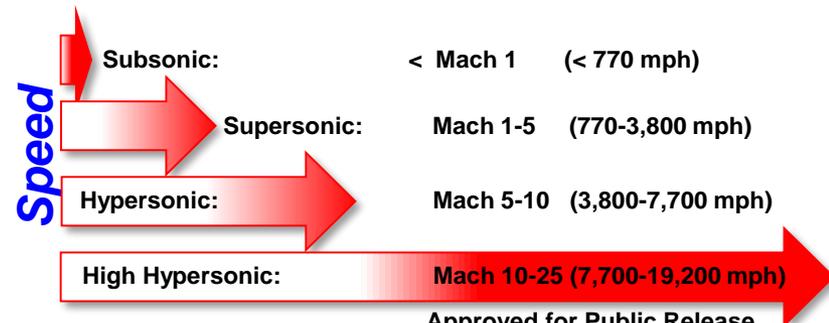
China
Dong Feng (DF-26) IRBM



Russia
Concept Hypersonic Glide Vehicle



SRBM: Short Range Ballistic Missile	(300-1000 km :: 621 mi)
MRBM: Medium Range Ballistic Missile	(1000-3000 km :: 1864 mi)
IRBM: Intermediate Range Ballistic Missile	(3000-5500 km :: 3418 mi)
ICBM: Intercontinental Ballistic Missile	(5500+ km :: 3418+ mi)



Ref: 2019 Missile Defense Review

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Missile Defense Agency Mission

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



**Missile Defense Capability
Globally Deployed**

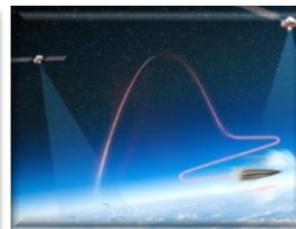
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Missile Defense Agency Lines of Effort

In Support Of The National Defense Strategy

- Build **Warfighter confidence** through focus on **readiness and sustainment**
- Increase engagement **capability and capacity** to outpace emerging threats
- Increase **speed of delivery** of new capability to address the **evolving threat**



“A robust and credible layered missile defense system paired with our conventional and nuclear force capabilities provides the ability to deter strategic attacks, deny benefits, and impose costs against any potential adversary.”

-- Admiral Charles A. Richard, U.S. Strategic Command



Today's Layered Active Missile Defense System

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C2BMC Command and Control, Battle Management and Communications

NMCC

USSTRATCOM

USNORTHCOM

USINDOPACOM

USEUCOM

USCENTCOM

BOOST
Defense Segment

ASCENT/MIDCOURSE
Defense Segment

TERMINAL
Defense Segment

**The System
Of Elements**

GBI
Ground-Based
Interceptor

SM-3 IIA
Standard
Missile

SM-3 IA/IB
Standard
Missile

THAAD
Terminal High
Altitude Area
Defense

SM-6
Standard
Missile

GMD
Ground-based
Midcourse
Defense

**Aegis
Ship & Ashore**
Ballistic Missile
Defense

**Aegis
Sea-Based
Terminal**

PAC-3
Patriot Advanced
Capability

Sensors



Satellite Surveillance
BMDS OPIR Architecture



Upgraded Early
Warning Radars



Forward-Based
Radars



AEGIS BMD
SPY Radars



Discriminating
Radars

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FMS
May 2020



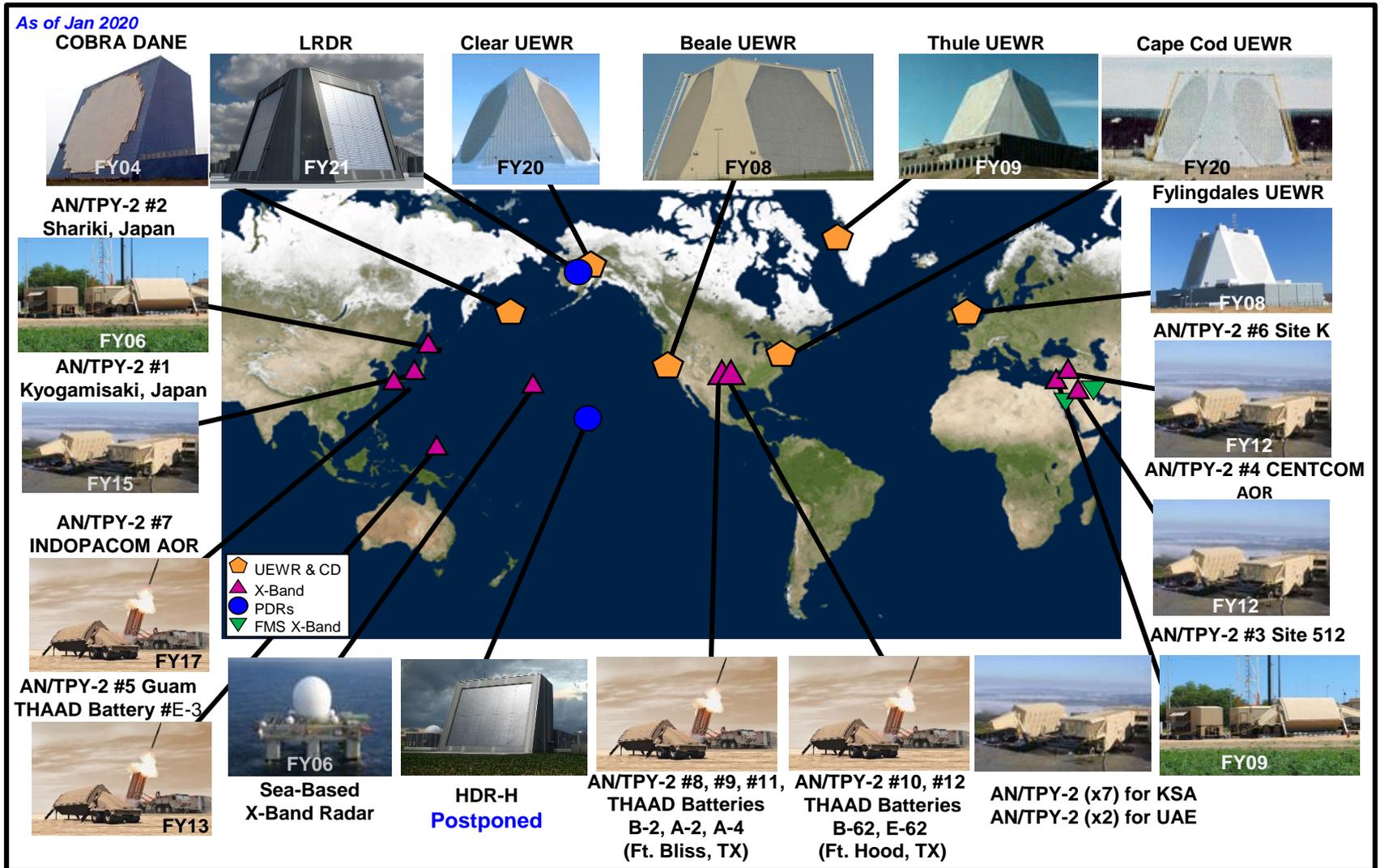
Ground Sensors Directorate

Mission, Contributions to The Missile Defense System (MDS)

- ◆ **Mission: Develop, Test, Acquire, Deploy, and Sustain MDS Ground Sensors**
- ◆ **Ground Sensors Contributions to Operational MDS**
 - Provide Track, Discrimination, and Intercept Assessment Data
 - Global Ground Sensor Coverage (16 time zones, 3 continents)
 - Additional Ground Sensors Planned
 - Address Evolving Missile Threats
- ◆ **Ground Sensors Contribution to MDS Testing**
 - Integrated & Distributed Ground Tests
 - Flight Tests (Aegis, Terminal High Altitude Area Defense (THAAD), mid-course defense)
 - Operationally Representative Models & Simulations (M&S) Validation & Accreditation
- ◆ **Supporting International Cooperation with THAAD Foreign Military Sales (FMS) Cases**

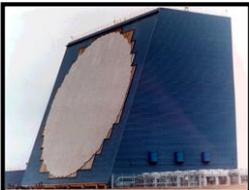


Ground Sensors Around the World Contribution to the MDS





MDS Radar Missions



Eareckson AFS,
Shemya AK

COBRA DANE Radar (CD) Missions

- GMD Midcourse Sensor
 - Acquisition
 - Tracking
 - Classification
- Space Domain Awareness: Detects, identifies, and tracks man-made objects in earth orbit

Upgraded Early Warning Radars (UEWR) Missions



Beale



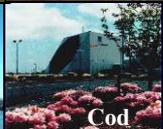
Fylingdales



Thule



Clear



Cod

FY 20

FY 20

- Ground-based Midcourse Defense (GMD) Midcourse Sensor
 - Acquisition
 - Tracking
 - Classification
- Integrated Tactical Warning & Attack Assessment (ITW/AA): Provides early warning of ballistic missile attack
- Space Domain Awareness: Detects, identifies and tracks man-made objects in earth orbit

AN/TPY-2 Radars



Terminal Mode (TM) Mission

- Sensor for Terminal High Altitude Area Defense (THAAD) Weapon System
- Detects, tracks, and discriminates
- Communicates with THAAD fire control and interceptor to destroy threat

Forward-Based Mode (FBM) Mission

- Detection close to threat origin, boosting ballistic missile
- Tracks, discriminates, and reports to C2BMC
- Target destroyed by Ground-Based Interceptor or Standard Missile



FY 21

Long Range Discrimination Radar (LRDR) Mission

- 24x7 persistent long range midcourse discrimination, precision tracking and hit assessment in BMDS Pacific architecture
- Raid handling performance over wide range of threat trajectories
- Support conservation of Ground Based Interceptor (GBI) inventory
- Support multi-mission areas (e.g., Space Domain Awareness)

Sea-Based X-Band Radar (SBX) Mission



- GMD Midcourse Sensor
- Cued search, acquisition, track, discrimination, and hit assessment
- Performs precision track
- Provides data on all target complexes to GMD interceptors

Homeland Defense Radar – Hawaii (HDR-H) Mission



Postponed

- 24x7 persistent tracking/discrimination against PACOM threats in complex countermeasure environment
- Improve BMDS to defend Hawaii
- Support multi-mission areas (e.g. Space Domain Awareness)



Top Management Focus Areas

- **Build Warfighter confidence through focus on readiness and sustainment**
 - Sustain Deployed Army Navy/Transportable Radar Surveillance and Control Model-2 (AN/TPY-2) Radars, Sea-Based X-Band Radar (SBX), Upgraded Early Warning Radars (UEWRs), and COBRA DANE
 - Support Robust MDS Flight and Ground Testing
 - Complete FTX-26: Flight test with the Long Range Discrimination Radar (LRDR) and SBX
 - Complete Ground Test (GT)-20 Sprints and GTI-08a (N/I) evaluating both theater/regional and homeland defense capabilities
 - Improve Ground Sensor Reliability
 - Increase robustness to AN/TPY-2 and COBRA DANE radars through additional spares, hardware/software improvements, float components
 - Upgrade SBX radar cooling system, and thrusters
 - Improve Cybersecurity Posture
- **Increase engagement capability and capacity to outpace emerging threats**
 - Address Ground Sensor Coverage Gaps
 - Deploy LRDR to Clear, Air Force Station, AK
 - Improve Ground Sensor Discrimination, Debris Mitigation, and BMDS System Track
 - AN/TPY-2 and SBX Software Upgrades to maintain and improve performance against an evolving threat
 - Complete SBX x86 Processor upgrades and deploy AN/TPY-2 x86 upgraded Processors
 - Complete Clear/Cape Cod Early Warning Radars Upgrades
 - Continue AF-funded RAF Fylingdales and Thule processing equipment upgrades'
 - Complete RAF Fylingdales and Thule Operational testing and Ops Acceptance by United States Space Force (USSF)
- **Increase speed of delivery of new capability to address the evolving threat**
 - Develop AN/TPY-2 and LRDR Electronic Protection capabilities

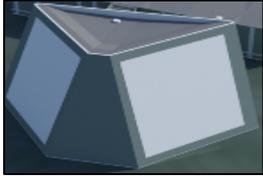
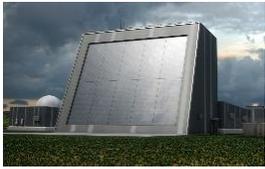


Potential Sub-Contracting Opportunities

Contract	Description	Prime(s)	Current PoP End
SBX Mission Integration  	<ul style="list-style-type: none"> ◆ SBX vessel integration and coordination of services (tech, ops, supply, etc) through various sources 	Gryphon Technologies	June 2024
Radar Development Contract (RDC)  	<ul style="list-style-type: none"> ◆ Program Management ◆ Hardware & Software Development and Sustainment for AN/TPY-2 and SBX Radars ◆ Engineering Services 	Raytheon Integrated Defense Systems (IDS)	October 2023
Contractor Logistics Support (CLS)  	<ul style="list-style-type: none"> ◆ Operations and Sustainment activities for all AN/TPY-2 radars and SBX ◆ Deployment and Site Support ◆ Depot transition support 	Raytheon Integrated Defense Systems (IDS)	October 2024
Radar Test Contract (RTC)     	<ul style="list-style-type: none"> ◆ Flight and ground test support to Upgraded Early Warning Radars (UEWRs) and COBRA DANE (CD) and X-Band Radars ◆ Models and Simulations 	Raytheon Integrated Defense Systems (IDS)	January 2023
AN/TPY-2 FMS – United Arab Emirates (UAE) 	<ul style="list-style-type: none"> ◆ Operations and Sustainment of 2 AN/TPY-2 radars in-country ◆ Spares, Sustainment, Maintenance, and Training 	Raytheon Integrated Defense Systems (IDS)	October 2020
AN/TPY-2 FMS – Kingdom of Saudi Arabia (KSA) 	<ul style="list-style-type: none"> ◆ Production and initial CLS of 7 AN/TPY-2 radars in-country ◆ Spares, Sustainment, Maintenance, and Training 	Raytheon Integrated Defense Systems (IDS)	August 2027



Potential Sub-Contracting Opportunities (cont.)

Contract	Description	Prime(s)	Current PoP End
Long Range Discrimination Radar (LRDR) 	<ul style="list-style-type: none"> ◆ Radar Development and Production ◆ Site construction ◆ Deploy ◆ Sustainment 	Lockheed Martin	September 2023
Homeland Defense Radar (HDR) 	<ul style="list-style-type: none"> ◆ Multi-Award Indefinite Delivery / Indefinite Quantity (MAIDIQ) ◆ Radar Development and Production ◆ Site construction ◆ Logistics 	Lockheed Martin, Northrop Grumman, Raytheon Integrated Defense Systems (IDS)	July 2025
Upgraded Early Warning Radar Sustainment and Modification of Optical and Radar Sensors (SMORS) [USAF] 	<ul style="list-style-type: none"> ◆ Upgrade of Early Warning Radars at Clear, Cape Cod, and Beale AFB, RAF Fylingdales, and Thule AB 	Raytheon Integrated Defense Systems (IDS)	December 2020
COBRA DANE (CD) Recompete [USAF] 	<ul style="list-style-type: none"> ◆ Upgrade of CD to extend service life beyond 2030; parts obsolescence, DMSMS 	Raytheon Information & Intelligence Systems (IIS)	March 2023

NOTE: UEWR and CD are sustained via USAF. Small Business opportunities will be via the USAF. There are no future UEWR or CD MDA contracts planned at this time.



How Can Small Businesses Help?

◆ Support Ground Sensors Top Management Focus Areas

- Offer flexible technical expertise to support multiple Radars deployed worldwide
- Offer affordable acquisition and sustainment costs through open, non-proprietary, modular software architecture
- Leverage existing hardware/software reuse and economy of scale benefits
- Offer innovative solutions to parts obsolescence and DMSMS challenges

◆ Develop partnerships with Current Prime Contractors and other mission area partners

◆ Communicate with the Government

- Attend Industry Days when scheduled
- Provide feedback on Draft Request for Proposal
- Monitor beta.sam.gov for subcontracting opportunities



AN/TPY-2



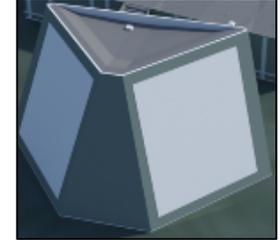
SBX



UEWR



COBRA DANE



LRDR



HDR

