2020

Missile Defense Agency
Office of Small Business Programs
Virtual Conference
Targets and Countermeasures (TC)

Presented at:

MDA Small Business Conference

Date: May 13, 2020

Presented by:

Frank Barrow
Director, TC Acquisition Management
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
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

Range

- SRBM: Short Range Ballistic Missile (300-1000 km; 186-621 mi)
- MRBM: Medium Range Ballistic Missile (1000-5000 km; 621-3110 mi)
- IRBM: Intermediate Range Ballistic Missile (5000-8000 km; 3110-5000 mi)
- ICBM: Intercontinental Ballistic Missile (>5000 km; >3110 mi)

Note: Range rings from Pentagon to show scale

Speed

- Subsonic: Mach 1 (<770 mph)
- Supersonic: Mach 1-5 (770-3,000 mph)
- Hypersonic: Mach 5-10 (3,800-7,200 mph)
- High Hypersonic: Mach 10-15 (7,200-19,200 mph)

- North Korea
  - Hwasong-15 ICBM
- Iran
  - Emad-1 MRBM with MaRV
- China
  - Dong Fang (DF-21) IRBM
- Russia
  - Concept Hypersonic Glide Vehicle
Today’s Layered Active Missile Defense System

C2BMC Command and Control, Battle Management and Communications

NMCC  USSTRATCOM  USNORTHCOM  USINDOPACOM  USEUCOM  USCENTCOM

BOOST Defense Segment

ASCENT/MIDCOURSE Defense Segment

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

Aegis Sea-Based Terminal

PAC-3 Patriot Advanced Capability

The System Of Elements

GMD Ground-based Midcourse Defense

Aegis Ship & Ashore Ballistic Missile Defense

Sensors

Satellite Surveillance BMDS OPIR Architecture

Upgraded Early Warning Radars

Forward-Based Radars

AEGIS BMD SPY Radars

Discriminating Radars
Targets and Countermeasures Program Directorate

- Led by Mr. Stan Thomas, Senior Executive Service

- Develop quality, threat representative, cost-effective target solutions with systematic rigor enabling the Missile Defense System (MDS) to test system performance and demonstrate its effectiveness in threat relevant environments

- The Target System Portfolio includes target classes of Intercontinental Ballistic Missile (ICBM), Intermediate Range Ballistic Missile (IRBM), Medium Range Ballistic Missile (MRBM), and Subscale/Short Range Ballistic Missile (SRBM)

- 97.5% Success Rate; 79 out of 81 successful targets launched since January 2010
Why Targets and Countermeasures?

MDA develops and deploys a **layered** MDS to **defend** the U.S., its deployed forces, allies, and friends from missile attacks in **all phases** of flight.

MDA conducts realistic flight tests to validate MDS modeling and simulations, and gather data to support capability assessments.

TC provides threat-representative targets and countermeasures (aka Associated Objects) for MDA and other customers flight tests.
The MDS requires targets that emulate the threat
Targets Portfolio Breakdown
“18 Programs at various acquisition stages”

TARGETS AND COUNTERMEASURES PROGRAM

Long Range Targets
- ICBM Multiple Configuration Types
- IRBM Multiple Configuration Types
- MRBM Type 3

PM – Angela Holmes

Suppliers
- NORTHROP GRUMMAN
- Orbital ATK

Medium Range Targets
- MRBM Multiple Configuration Types
- Modified Ballistic Reentry Vehicle
- Countermeasures
- Advanced Target

PM – Mike Bruno

Suppliers
- Aerojet Rocketdyne
- Coleman Aerospace

Subscale Targets
- SRBM / MRBM
- T4 Related Targets

PM – Dave Goodall

Suppliers
- NORTHROP GRUMMAN
- Orbital ATK

PROGRAM SUPPORT/FUNCTIONAL ACTIVITIES

- Motor Lifecycle Management (Mgt.)
- Property Accountability & Mgt.
- Support Equipment Lifecycle Mgt.
- Hazardous Material Support (Spt.)
- Data Products Lab
- Systems and Sustainment Engineering
- Quality, Safety, and Mission Assurance
- Range Pre/Post Mission Spt.
- Transportation Mgt. Spt.
- Component Testing
- Flight Test Execution
- Personnel Mgt.
- Test Pathfinder Spt.
- Acq/Contract Mgt.
- Financial Mgt.
- Target Storage Mgt.
- Support Agreement Mgt.
### Evolving Target System Portfolio

<table>
<thead>
<tr>
<th>Class</th>
<th>SRBM</th>
<th>MRBM</th>
<th>IRBM</th>
<th>ICBM</th>
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<td>Launch Stool</td>
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NOT DRAWN TO SCALE

NOT DRAWN TO SCALE
Program Description
Ranges and Forward Staging Areas

Air / Land Launches

- Elmendorf AFB
  Air Launch Staging

- Pacific Space Complex – Alaska (PSCA)
  IRBMs

- Andersen AFB
  Air Launch Staging

- Wake Island
  SRBMs, MRBMs, Air Launch Staging

- Pacific Missile Range Facility
  SRBMs, MRBMs

- J/B Lewis-McChord
  Air Launch Staging

- J/B Hickam-Pearl Harbor
  Air Launch Staging

- Pt Mugu
  Air / land
  SRBMs, MRBMs

- White Sands Missile Range
  (WSMR)
  SRBMs

- Reagan Test Site
  SRBMs, IRBMs, ICBMs

- Vandenberg AFB
  SRBMs, MRBMs, IRBMs, ICBMs

- Hebrides Range, UK
  Multinational exercises

- NASA / Wallops
  SRBM raid scenarios

- Misawa AFB
  Air Launch Staging

- Wake Island
  SRBMs, MRBMs, Air Launch Staging

- Andersen AFB
  Air Launch Staging

- Pacific Missile Range Facility
  SRBMs, MRBMs

- J/B Hickam-Pearl Harbor
  Air Launch Staging

- Pt Mugu
  Air / land
  SRBMs, MRBMs

- White Sands Missile Range
  (WSMR)
  SRBMs

- Reagan Test Site
  SRBMs, IRBMs, ICBMs

- Vandenberg AFB
  SRBMs, MRBMs, IRBMs, ICBMs

- Hebrides Range, UK
  Multinational exercises

- NASA / Wallops
  SRBM raid scenarios
Acquiring Targets/Threat Solutions
“Employs Systems Engineering Rigor”

**Target System Baseline Acquisition**
- Joint Working Team
  - MDA/DE
  - MDA/TC

**Data Collection Requirements**
- IMTP
- ACD
- CECs/EMEs
- Ground Test Requirements

**Mission Specific Target Acquisition**
- Target Requirements Working Group (TRWG)
  - Chaired by: DE
  - Participation by: TC, DT, and Elements

**Target Class Capabilities & Requirements Document (TCC&R)**
- Establishes Target Class Technical Baseline Requirements
  - Owner: MDA/DE

**Target Data Products Requirements Document (TDPRD)**
- Establishes Data Product Requirements
  - Owner: MDA/DE

**Target Trajectory Memorandum (TTM)**
- Specifies Final Mission Approved Target Trajectory with Traceability to Threat
  - Owner: MDA/DE

**Target System Performance Specification (TSPS)**
- Establishes Performance Specification for Target Class Capability Configuration Item Procurement
- Target Class Configuration Items Primarily Consist of Launch Vehicles, Re-entry Vehicles, or Associated Objects
  - Owner: MDA/TC

**Target Configuration Document (TCD)**
- Specific all Target Requirements used by TC for Contract Action, Establishes Missionized Target Configuration Item
  - Owner: MDA/TC

**Target Class Product Development**
- Flight Target
- Target Model

**Targets Inventory**
- SRBM
- MRBM
- IRBM

**Mission Specific Target Product Development**
- Flight Target
- Target Model
Mr. Stan Thomas, Program Executive’s High Level Acquisition Objectives

- Meet customers’ performance, schedule, and service needs to counter an evolving threat
- Flexible/agile contract structure to quickly turn on reconfiguring/assembling evolving threat solutions to meet changing threat requirements
- Seek common internal components, multiple, adaptable, shapes, and kits that can be rapidly configured to represent evolving threats
- Reduce cost per threat solutions as well as contain costs and risks
- Incentivize Performance, Cost Containment, Mission Assurance, Collaboration, and Design Innovation
- Sustain continuity of service and infrastructure to deliver relevant threat solutions and reliable targets
- Continue communications and foster relationships that preserves and expands the industrial base to incorporate advanced or evolving threat capabilities for future deliveries
TC Acquisition Conditions

- TC is responsible to develop new targets and countermeasures as well as providing mission specific reviews and support to each flight test.

- TC does as much cradle to grave acquisitions/contract actions as any other MDA organization.

- TC has 18 programs at various stages of acquisition, development, production, and disposal—continuous market research and industrial base assessment.

- TC also delivers products and provides services to multiple Other Government Agencies.

- TC workload is mostly Non-Recurring Engineering, development, launch support, and product sustainment activities.

- The fluid nature of the MDA Integrated Master Test Plan requires a significant level of effort/OPSTEMPO.

- Significant effort is also expended in support of confidence briefings, analysis, etc. for non-TC targets provided for MDA missions.
Acquisition Considerations

- Expand and sustain the industrial base

- Collaboration with Industry builds good Market Research and encourages competition, innovation and best value

- TC Supports Small Business Utilization

- Enforce Cybersecurity, Security, and protection of information

- All TC Solicitations/Contracts include MDA Assurance Provisions (MAP)/MDA Parts, Materials, and Processes Mission Assurance Plan (PMAP)

- Incentives will be consistent with scope, risks, objectives, and contract structure

- Data
  - Tailoring data based on need, value, and use for multiple purposes
  - Acquire no more restrictive than Government Purpose Rights (GPR)
Acquisition Consideration (Cont.)

- **Task**
  
  Provide contractual solutions for procurement of real-world, threat-representative ballistic missile target vehicles and countermeasure articles to accommodate flight testing

- **TC Portfolio** includes managing multiple contracts, contract types, and support agreements

- **Path Ahead:** Look for contract structures that support uncertainty in future requirements and threat changes, reduces unneeded excess/quantities, and lessens cost growth due to IMTP fluctuations

- **Need Contract Flexibility for:**
  - Ability to accommodate quick turn contract actions/changes
  - MDS IMTP schedule changes
  - Specific test configuration and quantities change
  - Incorporate advanced threat solutions; etc.

- Allows for long-term relationship with industry partners/suppliers
Challenges/Opportunities

- Need to Reduce Long Design/Development/Qualification Process
- Require Quick Turn Changes to Deliver Threat Representative Solutions
- Monitor Long Lead Hardware for Advanced Materials
- Monitor Industrial Base Manufacturing Capabilities and Forgings Concerns
- Need Extensible, Modular Architecture to Incorporate Enhancements
- Quality/Mission Assurance Processes Integrated Post Contract Award
- Stay tuned to SAM.Gov (formerly known as FBO.Gov / FedBizOpps) for current and future TC market research and solicitation activities
  - Request for Information (RFI) Solicitation Number RFITCFUTURES080118; “TC Futures RFI” released August 2018 (Market Research activities continues)
  - Completed Threat Front Ends Industry Day Event and 1-On-1s June 2019
  - Follow Up Questions to RFI Solicitation Number RFITCFUTURES080118—Launch Vehicles Section for a C4 Solid Rocket Motor Replacement
  - Request for Quotes for Information Technology Hardware and Software for Lab
  - Potential Future RFIs: Rocket Motor Technical Services, Associated Objects/Countermeasures, and Future Threat Front Ends (update)
THANK YOU