

# Ballistic Missile Defense Update For The 11<sup>th</sup> AUSA Tactical Missile Conference



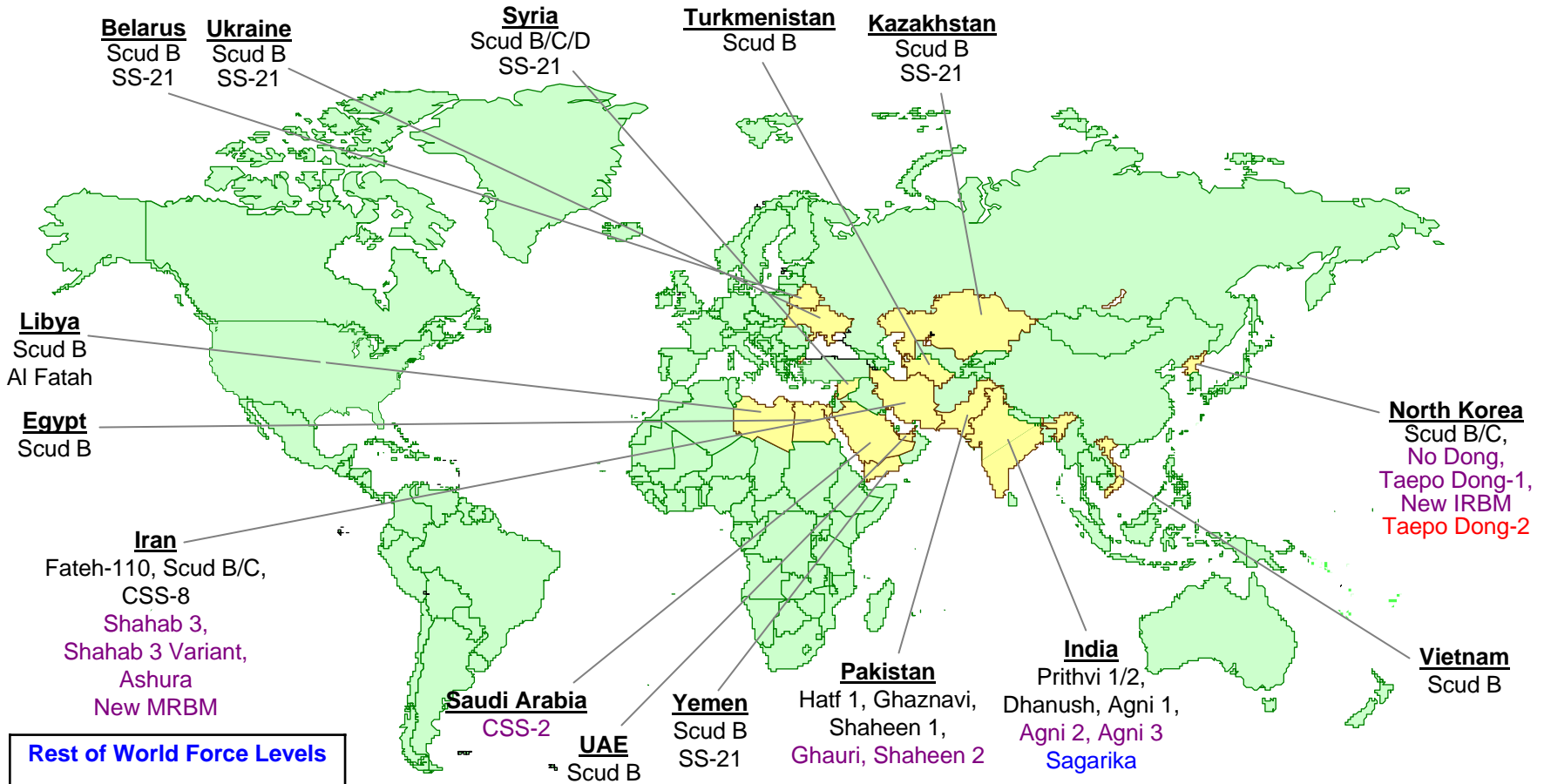
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**19 MAY 09**

**LTG Patrick J. O'Reilly, USA**  
**Director**  
**Missile Defense Agency**



# Foreign Ballistic Missile Programs 2009



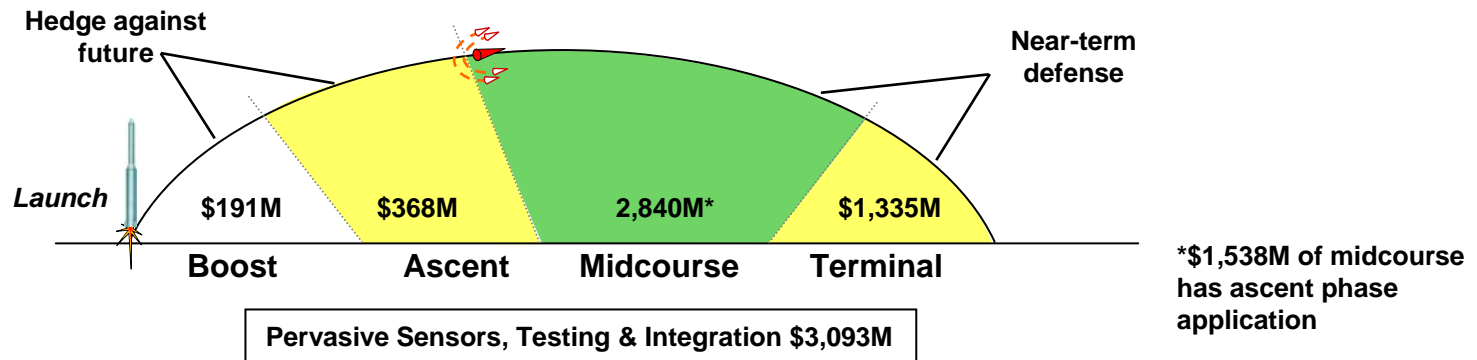
Rest of World Force Levels	
2008	
SRBM	5,500
MRBM	350
IR/ICBM	<40
<b>Totals</b>	<b>5,900</b>

*“Current trends indicate that adversary ballistic missiles, with advanced liquid- or solid-propellant propulsion systems, are becoming more flexible, mobile, survivable, reliable and accurate while also presenting longer ranges.”*  
*LTG Michael Maples, Director, DIA*

Sources: OSD, Proliferation: Threat and Response, 2001; NASIC, Ballistic and Cruise Missile Threat, 2003, 2006; DIA Annual Threat Assessment, 2007, 2008 DIA/MSIC Message 2009281441SS(U) ms-112356 / 051909



# Missile Defense Goals



- Provide a balance of capabilities, requirements, and risks to deter aggression, project power, and protect U.S. and allied interests
- Respond to war fighter requirements to counter the most pressing near-term regional threats
- Pursue cost-effective and operationally effective missile defense capabilities to hedge against future threat uncertainties



# FY10 Missile Defense Program Strategy

- Enhance protection of our deployed forces, allies and friends against existing threats
  - Field more THAAD and SM-3 interceptors
  - Begin conversion of 6 additional Aegis ships
- Maintain a ground-based midcourse capability to defeat rogue state threats or accidental launch against the United States
  - Complete emplacement of 26 GBIs at Ft. Greely and 4 at VAFB
  - Complete procurement of 14 GBIs
    - Backfill oldest GBIs
    - Refurbish and test removed GBIs
    - Maintain 4 operational spares
- Enhance rigorous BMDS testing
- Balance Midcourse R&D with Ascent Phase Intercept (API) R&D
  - Terminate midcourse Multiple Kill Vehicle
  - Terminate Kinetic Energy Interceptor program
  - Leverage emerging API technologies to hedge against threat growth, increase operational effectiveness and efficiency
  - Cancel ABL Tail #2 and focus program on R&D
- Continue plans to deploy a European Capability to defeat longer-range threats to the extent allowed by law
- Increase size and qualification of MDA government workforce and efficiency of operations

TY\$ in Millions	FY10
Development	4,153.3
Test	1,458.0
Fielding	1,509.2
Sustainment	705.9
<b>Total</b>	<b>7,826.4</b>



# The PB10 BMDS

## Sensors



Overhead Persistent Infrared



UAV Based Sensor



Space Tracking & Surveillance System



Sea-Based Radars



Early Warning Radar



Midcourse X-Band Radar



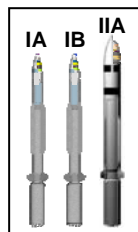
AN/TPY-2



SPY-1



Airborne Laser (Tail 1)



SM-3



Aegis BMD



Ground-Based Midcourse Defense



Terminal High Altitude Area Defense



Sea-Based Terminal



Patriot Advanced Capability-3

Command, Control, Battle Management & Communications



NMCC USSTRATCOM USNORTHCOM USPACOM EUROM CENTCOM

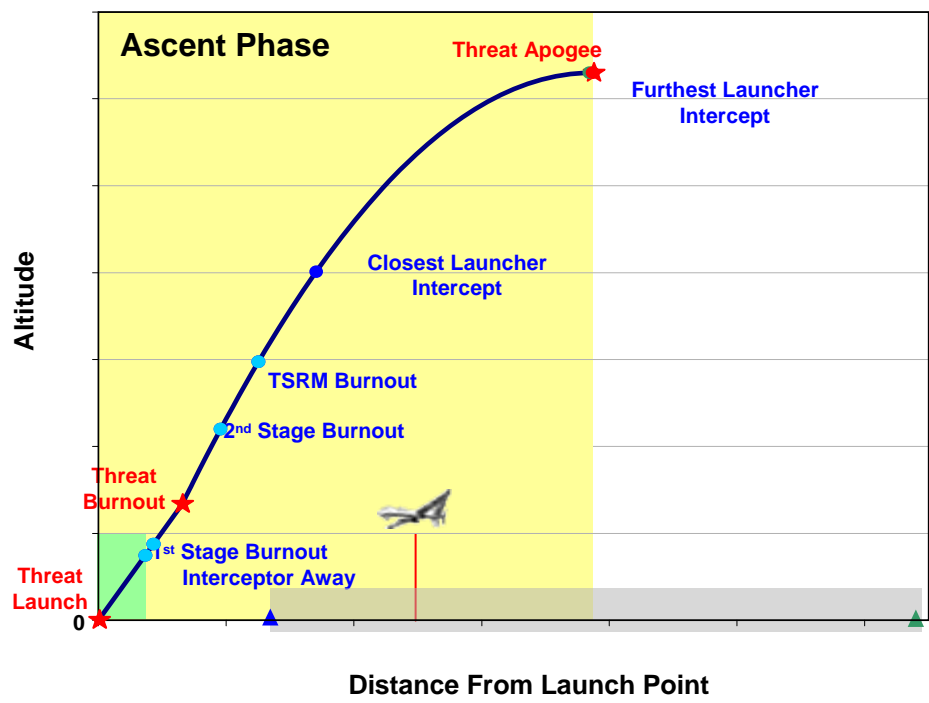
**PB10 Sustains Midcourse Defense (ICBMs) While Emphasizing Terminal (SRBMs) And Efficient And Operationally – Effective Ascent Intercepts (MRBMs, IRBMs)**



# Why Ascent Phase Intercept?

- **Ascent Phase intercept will help us achieve key operational- and cost-efficiencies**
  - **Chance to kill before countermeasures deploy with easier intercepts than boost phase**
  - **Greater chance to shoot-look-shoot (doubles inventory efficiency)**
  - **Optimized asset locations to maximize standoff distances**
  - **2002 Defense Science Board Report recommended it for emphasis**
- **What's changed since 2002:**
  - Leveraging Today's Technologies**
    - **Interceptors with substantial burnout velocities**
    - **Rapid closure of fire control loops demonstrated with hardware-in-the-loop**
    - **Over-the-horizon sensors for netted coverage**
    - **Affordable, continuously-available sensors**

Medium Range Ballistic Missile





# New Initiatives

## DSA Infrastructure



Models and Simulations

## Transportable VLS



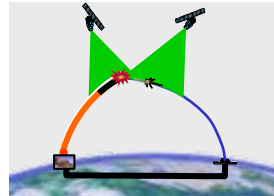
Land-Based SM-3



Precision Tracking Satellite System Planning



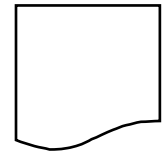
Risk Reduction For Extended Range THAAD



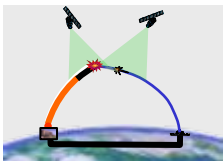
Ascent Phase C2BMC



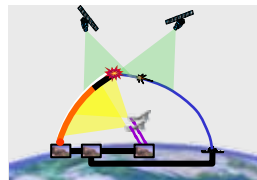
Airborne Infrared System To Support BMD



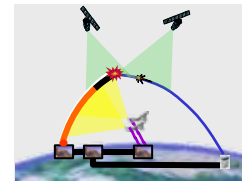
Other SAP



Engage on STSS Demo Satellites



Engage on Airborne Infrared (sea-based SM-3)



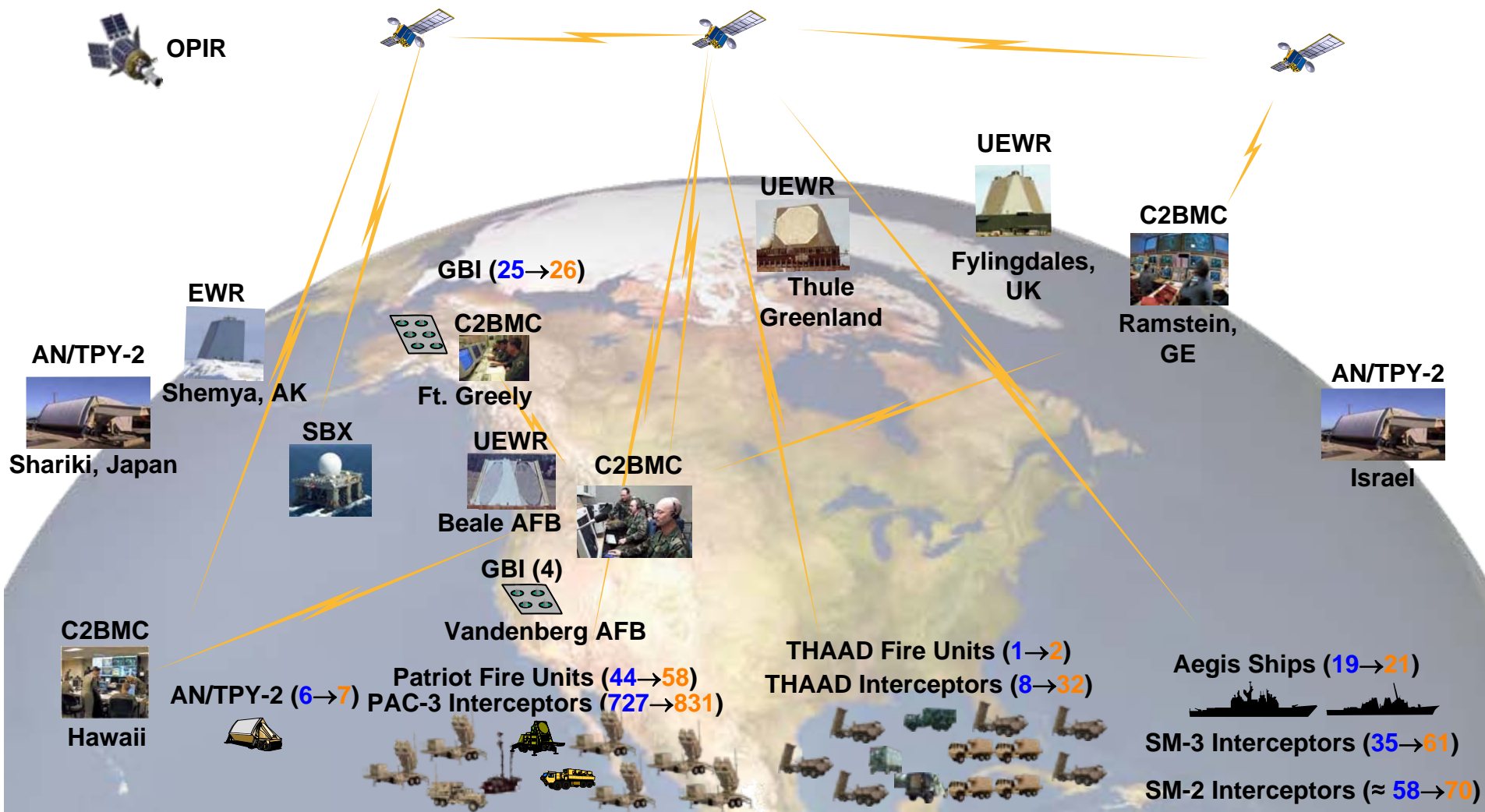
Engage on Airborne Infrared (land-based SM-3)



Airborne Laser Lethal Shootdown



# System Configuration End Of FY 2009 → End Of FY 2010



C2BMC = Command, Control And Battle Management Network  
 EWR = Early Warning Radar  
 OPIR = Overhead Persistent Infrared

SBX = Sea-based X-Band Radar  
 SM-2 = Standard Missile-2 Terminal Interceptor  
 SM-3 = Standard Missile-3 Interceptor

UEWR = Upgraded Early Warning Radar  
 THAAD = Terminal High Altitude Area Defense





# BMDS Test Review

- **Phase 1 (January 2009) – determined data needed to validate BMDS Modeling and Simulation (M&S) and evaluate operational effectiveness, suitability, survivability, supportability**
  - **101 critical variables and parameters (Critical Engagement Conditions and Empirical Measurement Events) that must be tested to validate M&S**
- **Phase 2 (March-May 2009) – determine test venues and scenarios to acquire the data identified in Phase 1**
  - **6 test campaigns to conduct approximately 144 tests (including 56 flight tests involving 37 tests where threat targets are intercepted)**
- **Phase 3 (June 2009) – Identify the resources and the planning infrastructure, including targets and test ranges, to execute those scenarios identified in Phase 2**
  - **Work in progress**

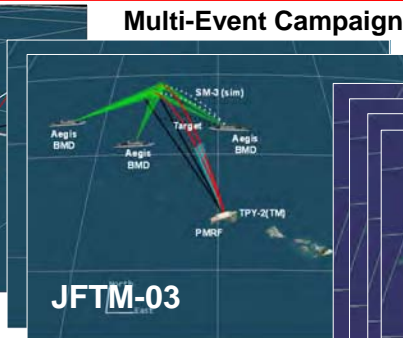


# FY10 Test Campaign

• PAC-3 Events Not Depicted

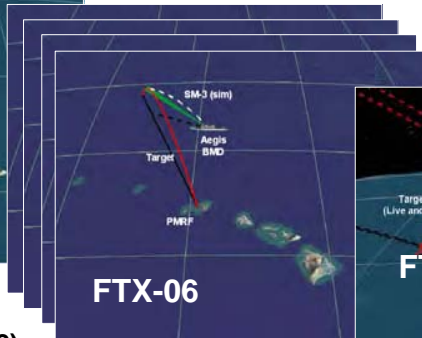


**FTL-02**  
**ABL Boost Phase SRBM Negation**  
 (Q1)



**JFTM-03**  
**Int'l SM-3 SRBM Intercept with U.S. TrackEx.**  
**Int'l/U.S. SRBM TrackEx (2) with Simulated Intercepts**  
 (Q1)

## Multi-Event Campaign



**FTX-06**  
**First Aegis BMD 4.0.1 SRBM TrackEx (4) with Simulated Intercepts**  
 (Q1)



**FTT-12**  
**THAAD Simultaneous MRBM/SRBM Intercept with Simulated Mass Raid**  
 (Q1)



**FTL-03**  
**ABL Negation with Different Geometries**  
 (Q2)



**FTS-01**  
**First STSS SRBM Target Tracking Exercise**  
 (Q2)



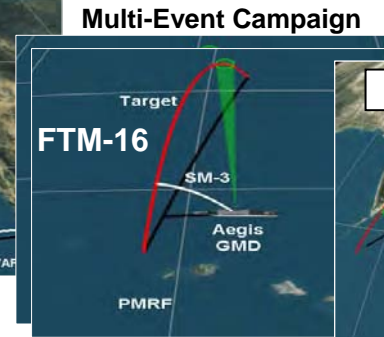
**FTL-04**  
**ABL Negation with Different Geometries**  
 (Q2)



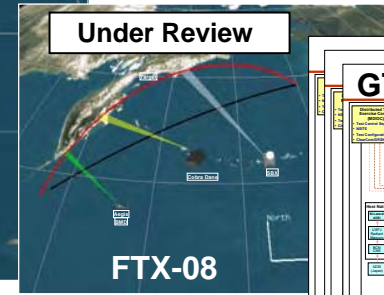
**FTT-13**  
**First THAAD Intercept of MRBM with CMs**  
 (Q3)



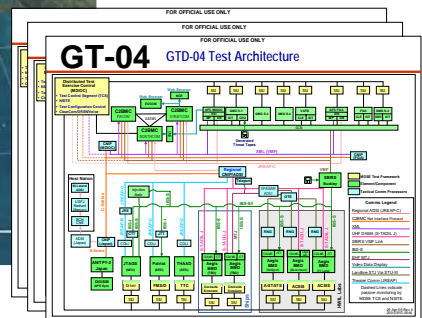
**FTG-07**  
**First 2-stage GBI IRBM Intercept**  
 (Q4)



**FTM-16**  
**First Aegis BMD SM-3 Bk 1B SRBM Intercept with TrackEx**  
 (Q4)



**FTX-08**  
**CD tracking Exercise of MRBM with simulated engagement**  
 (Q4)




- GT-04 exercises**
1. SSF Increment 1 integration
  2. Upgrades to SBIRS Rep
  3. Tactical Software Availability (Begins Q1)





# International Activity Highlights


## R&D Cooperative Efforts


 **UK:** Fylingdales UEW, Joint Project Arrangements for Cooperative Projects

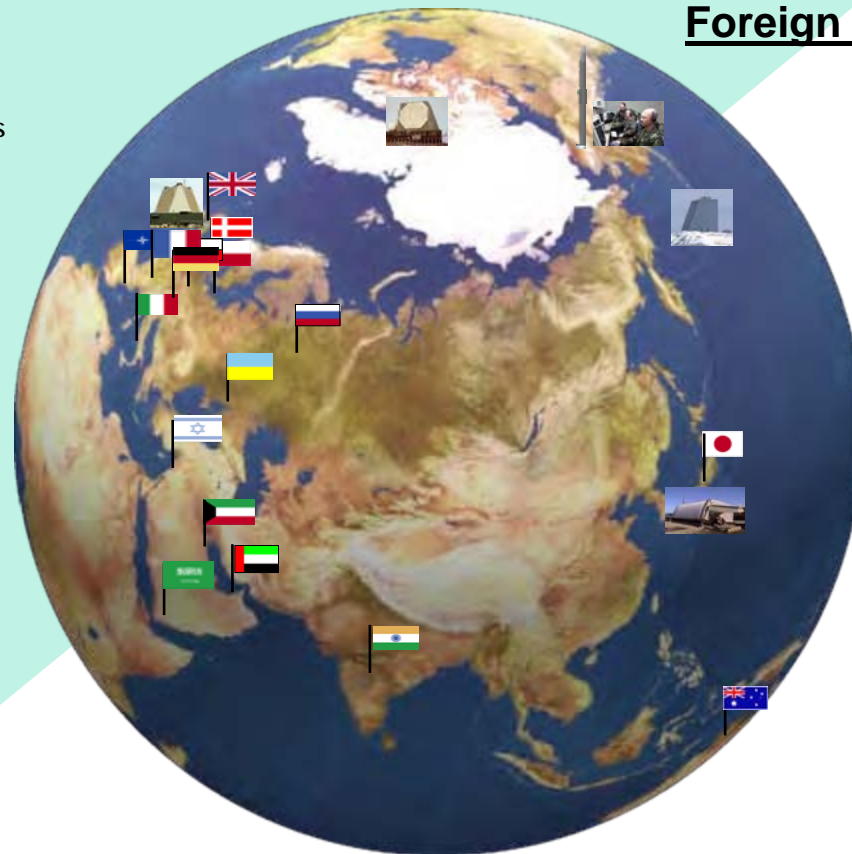
 **Italy:** MEADS partner


 **Denmark:** Upgrade Thule Early Warning Radar


 **Australia:** Advanced technology cooperation

 **Japan:** Forward-based X-Band radar siting, 21" Missile Development

 **Czech Republic:** Agreed to host midcourse radar; some RDT&E cooperation




 **NATO:** Completed tasking to explore architectures to supplement European Site. Working with ALTBMD to demonstrate connectivity between NATO and U.S. systems


 **Kuwait:** Expressed interest in missile defense


 **Saudi Arabia:** Requested BMD requirements analysis

## Foreign BMD Projects / Interests


 **Netherlands:** PAC-3, Maritime BMD Cooperation


 **France:** Cooperative project potential


 **Poland:** Agreed to host Ground Based Interceptors, potential RDT&E cooperation


 **India:** Have had discussions on RDT&E


 **Russia:** Strategic cooperation /transparency dialogue


 **United Arab Emirates:** Request for THAAD


 **Israel:** Arrow Deployed, Arrow System Improvement Program; development of short-range BMD, Upper Tier program

 **ROK:** Missile Defense discussions, Request for BMD requirement analysis

 **Germany:** MEADS partner, laser cross-link technology

 **Ukraine:** Conducting a missile defense project; RDT&E agreement being staffed

 **Bahrain:** Request for BMD requirements analysis

 **Qatar:** Expressed interest in missile defense



# Summary

- **Provide a balance of capabilities, requirements, and risks to deter aggression, project power, and protect U.S. and allied interests**
- **Respond to war fighter requirements to counter the most pressing near-term regional threats**
- **Pursue cost-effective and operationally effective missile defense capabilities to hedge against future threat uncertainties**

