Missile Defense Program Update

20 MAR 06

Lt Gen Trey Obering, USAF
Director
Missile Defense Agency
Ballistic Missile Defense
Policy And Mission

Policy

“… The United States plans to begin deployment of a set of missile defense capabilities in 2004. These capabilities will serve as a starting point for fielding improved and expanded missile defense capabilities later.”

“… Missile defense cooperation will be a feature of U.S. relations with close, long-standing allies, and an important means to build new relationships with new friends like Russia.”

White House Fact Sheet
National Policy on Ballistic Missile Defense, 20 MAY 03

Mission

• Develop an integrated layered Ballistic Missile Defense System
  - To defend the United States, its deployed forces, allies and friends
  - From ballistic missiles of all ranges
  - Capable of engaging them in all phases of flight
Why Did We Deploy When We Did?

• 4 of 5 successful intercepts in tests of the Ground-based Midcourse Defense System 1999-2002 proved technology

• Successful flight tests of the boosters’ operational configuration in 2003

• Successful completion of integration and checkout tests of the radars, command, control and communications system

• Completion of a comprehensive, independent safety review
Today’s Reality

Iran Tests Solid Fuel Motor for Missile
By ALI AKBAR
The Associated Press
Jun 1, 2005

Iran says it increased range, accuracy of its Shihab-3 missile
The Associated Press
August 9, 2005

Iran, Defiant, Insists It Plans To Restart Nuclear Program
The New York Times
Jan 10, 2006

N. Korea Develops Longer-Range Scud Missile With Up to 1,000-km Range
Kyodo World Service
February 15, 2005

NK’s Taepodong Missiles Could Be Operational By 2015: LaPorte
Korea Times
March 11, 2005

N. Korean Nuclear Advance Is Cited
Washington Post
April 29, 2005
Why Invest In Ballistic Missiles And Weapons Of Mass Destruction?

• Overcome a significant U.S. conventional weapon advantage
  - Such weapons offer a cost-effective way to offset U.S. military power and level the battlefield
  - The 1991 and 2003 Gulf Wars showed that countries will use ballistic missiles against our forces

• Enhance capabilities to deter, blackmail or coerce the United States and its allies and friends
  - Threaten our foreign policy objectives by holding cities and high-value assets hostage
  - Deny access or coerce a withdrawal of U.S. and friendly forces engaged in a regional conflict

• Acquire new tools of terrorism
  - Would take terrorism into a new, more frightening dimension

WMD Are the Great Strategic Equalizer, And the Ballistic Missile Is the Weapon of Choice
Tomorrow’s Possibilities

Pakistan’s Musharraf Overthrown!
Army of Muhammad controls nuclear-tipped missiles
Demands U.S. withdrawal from Afghanistan
March 25, 2007

North Korea detonates nuclear weapon after long range missile test
Warns U.S. not to interfere in unification
June 20, 2008

Iran successfully tests long-range missile
U.S., European Leaders Alarmed
September 5, 2011

Chavez announces intent to buy Chinese IRBMs
November 8, 2009

Russia Admits Tactical Nuclear Missiles Are Missing
Associated Press
February 15, 2009
Non-Traditional Acquisition

• MDA has adopted a Capability-based Acquisition Strategy
  - Requirements are based on evolving threat uncertainty, not precise predictions
  - Incorporates an interactive, collaborative approach
  - Focus is on fielding early capability with military utility

• Spiral development calls for continuous upgrades
  - Short timeframes do not lock on a final grand design
  - Periodic continuation reviews with flexible contracts reduce incentives for unrealistic expectations

• Knowledge points allow decisions on whether or how program development advances
  - Critical risks demonstrated early
Critics of the Missile Defense Program

• There is not enough oversight of MDA

• The testing is not realistic – you are cheating

• The cost of missile defense is not worth it

• This will lead to an arms race in the world

• Experts say the challenge is too great – it will never work
The “Experts”

“There is no field where so much inventive seed has been sown with so little return as in the attempts of man to fly successfully through the air.”
Rear Admiral George Melville
Chief Engineer in the U.S. Navy, 1901

The atomic bomb was “the biggest fool thing we have ever done. The bomb will never go off, and I speak as an expert in explosives.”
Admiral of the Fleet, William Daniel Leahy
One of President Truman’s most senior military advisors, 1945

“[Man will never reach the moon] regardless of all future scientific advances.”
Dr. Lee DeForest
Inventor of the electron tube, 1957
“The national missile defense interceptor cannot tell the difference between warheads and the simplest of balloon decoys. This means that the national missile defense system can simply not work.”

**Theodore Postol**
*MIT Professor of Science, Technology and National Security Policy*

““The concept of missile defense is quite seductive. (But) it’s destabilizing, it’s incredibly expensive, and it doesn’t work.”

**Philip Coyle**
*Senior Advisor to the President of the Center for Defense Information, 23 FEB 06*
Integrated Ballistic Missile Defense System

Sensors
- Space Tracking And Surveillance System
- Sea-Based Radars
- Forward-Based Radar
- Early Warning Radar
- Defense Support Program

Boost Defense Segment
- Kinetic Energy Interceptor
- Airborne Laser

Midcourse Defense Segment
- Aegis Ballistic Missile Defense
- Multiple Kill Vehicles
- Ground-Based Midcourse Defense

Terminal Defense Segment
- Patriot Advanced Capability-3
- Terminal High Altitude Area Defense

Command, Control, Battle Management & Communications

USSTRATCOM
USPACOM
USNORTHCOM
NMCC
An Integrated Approach To Ballistic Missile Defense

Combining different sensors with different weapons expands detection and engagement capabilities.
Missile Defense Program Strategy

• Field an initial increment of missile defense capability
  - Initial protection of entire U.S. from North Korea, partial protection of the U.S. from Middle East threat
  - Protection of deployed forces, allies and friends with terminal defenses

• Field next increment (2006-2007) of missile defense capability
  - Complete protection of U.S. from Middle East
  - Expand coverage to allies and friends
  - Increase countermeasure resistance, and increase capability against shorter-range threats

• Follow on increments begin to increase robustness of interceptor inventory and sensors
  - Addresses unconventional attacks
Current System Configuration
Block 2006

- Aegis Surveillance & Track Destroyers (11)
- Forward-Based X-Band Radar-Transportable
- Aegis Engagement Cruisers (2)
- Engagement Destroyers
- Standard Missile-3 Interceptors (9)
- U.S. Strategic Command
- U.S. Northern Command
- Fire Control Suite
- National Capital Region
- Patriot PAC-3 Batteries
- Fylingdales, UK Radar
- U.S. Pacific Command
- Sea-Based X-Band Radar
- Ground-Based Interceptors (9)
- Ground-Based X-Band Radar
- Beale Radar
- Cobra Dane Radar
- Ground-Based Fire Control Suite
- Ground-Based Interceptors (2)
Ft. Greely, Alaska
Vandenberg Air Force Base
Aegis BMD

Long-Range Surveillance & Track

Engagement
Sea-Based X-Band Radar (SBX)

SBX Under Way

SBX In Pearl Harbor

SBX Interior
Forward Based X-Band Radar–Transportable (FBX-T)
Ballistic Missile Defense System
December 2006
Test Accomplishments

• Long-Range Engagement
  - Successful Ground-Based Interceptor and kill vehicle performance test – December 2005
  - Successful demonstration of Cobra Dane (September 2005) and Beale (February 2006) radars – intercept solution generated and processed by fire control system
  - Acquired and tracked ICBMs with Forward-Based X-Band Radar
  - Achieved Sea-Based X-Band Radar high-power radiation – now in Hawaii enroute to Alaska

• Medium- and Short-Range Engagement
  - Successful Aegis intercept test – November 2005
  - Successful Terminal High Altitude Area Defense flight test – November 2005
  - Airborne Laser achieved successful full duration lase at operational power level – December 2005
  - Successful Japanese Standard Missile-3 nosecone proof-of-principal flight – March 2006
Sea Lite Beam Director Data
MIT Lincoln Lab, Raytheon, SVAD
THAAD FTT-01
Nov 22, 2005
MWIR-A AuASAM Telescope
3.3–5.0 micron
7.7 x 9.9 mrad FOV
Ground-based Midcourse Defense
Flight Test - 1
Sea-Based X-Band Radar
Planned Flight Testing In 2006

• Ground-based midcourse defense (long-range)
  ✓ Demonstrate operationally configured radar (Beale)
    - Demonstrate interceptor and verify kill vehicle functions – June/July
    - Conduct intercept test – September / October
    - Conduct intercept test – November / December

• Sea-based midcourse defense (short- to medium-range)
  ✓ Japanese interceptor nosecone proof-of-principle flight (non-intercept)
    - Conduct intercept test against separating warhead – June
    - Conduct intercept of a low exoatmospheric ballistic missile – November

• Ground-based terminal defense (Short- to medium-range)
  - Demonstrate Terminal High Altitude Area Defense interceptor – Mar-May
  - Two intercept tests against unitary (April-June) and separating targets (June-August)
  - Demonstrate low-altitude flight of interceptor – September-November
Emerging Block 2006 Capabilities

• Defense against intercontinental ballistic missiles from North Korea
  - Up to 22 Ground-Based Interceptors in Alaska and California
  - Initial radar discrimination software for complex threats

• Defense against emerging threats
  - Second forward-based radar March 2007, ready for forward-based functions December
  - Space-Based Infrared System (Highly Elliptical Orbit) integration December 2007
  - Space Tracking and Surveillance System demonstration satellites December 2007
  - Total of 3 cruisers / 7 destroyers with 26 Standard Missile-3 interceptors
  - Improved battle management and initial global integrated fire control
Uncertainties And Challenges

• Rogue Nations: Keep ahead of long-range threat inventories while significantly increasing capability against shorter-threats

• Threat Maturation: Keep pace with increasing threat complexity

• Unconventional Ballistic Missile Attacks: Negate attempts to circumvent the Ballistic Missile Defense System

• Emerging Threats: Maintain development program foundation to address capabilities

- With last year’s $5 billion reduction, we developed a program strategy to balance these risks

- This year’s cuts of an additional $1.8 billion and fact-of-life changes caused further program adjustments for 2007 budget
Approach To FY 2007 President’s Budget

- Maintain fielding and sustainment commitments
- Continue focus on mission assurance and quality
- Balance development to address current and future challenges

Fact of life changes have driven cost growth
- Exoatmospheric Kill Vehicle producibility challenges
- Extended qualification testing for Terminal High Altitude Area Defense
- Sea-based interceptor deployment stretched to accept technical upgrades

Program adjustments: Development
- Defer second Airborne Laser aircraft two years
- Delay fielding of Kinetic Energy Interceptor until after 2008 flight test
- Accommodate low risk technology and 2-color seeker in Multiple Kill Vehicle

Program adjustments: Fielding
- Focus on forward-deploying precision tracking and discrimination sensors
- Increase funding to achieve 24/7 operations and support
- 4 additional Ground-Based Interceptors thru Infrastructure Reduction
## President’s Budget FY07

*TY $’s in Millions*

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<th>President's Budget 2007</th>
<th>FY06</th>
<th>FY07</th>
<th>FY08</th>
<th>FY09</th>
<th>FY10</th>
<th>FY11</th>
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<td>779</td>
<td>789</td>
<td>630</td>
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<td>Total BMDS</td>
<td>7,695</td>
<td>9,318</td>
<td>9,536</td>
<td>9,956</td>
<td>10,121</td>
<td>9,873</td>
<td><strong>56,498</strong></td>
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Emerging Block 2008 Capabilities

- Increased capability against North Korea and Iran
  - Up to 38 Ground-Based Interceptors
  - Thule radar (Greenland) available

- Initial defense against asymmetric and improved capability against regional threats
  - 3 Aegis cruisers and 15 Aegis destroyers with 57 Standard Missile-3 interceptors
  - 24 Terminal High Altitude Area Defense interceptors

- Greater mobility to address surprise threats
  - Up to 3 forward-based radars
  - Surveillance and tracking satellites (2)
Block 2010 Capabilities

• Increased capability against North Korea and Iran
  - Up to 50 Ground-Based Interceptors (Includes 10 in Europe)
  - Thule radar (Greenland) fully integrated

• Improved defense against asymmetric and improved capability against regional threats
  - 3 Aegis cruisers and 15 Aegis destroyers with 81 Standard Missile-3 interceptors
  - 48 Terminal High Altitude Area Defense interceptors

• Greater mobility to address surprise threats
  - Up to 4 forward-based radars available
International Activity Highlights

**Framework Partners**

- **Japan**: FBX-T Siting, 21" Missile Technology, Information Sharing
- **UK**: Fylingdales UEWR, CM & Lethality Technology, Target Development, Third Site Candidate
- **Australia**: OTH Radar, M&S Partner, Future Joint Analysis
- **Denmark**: Thule UEWR
- **Italy**: FW MOU In Final Stages, MEADS Partner, Architecture Analysis Study

**Continuing Activity**

- **Israel**: AWS Deployed, ASIP Program
- **Germany**: MEADS Partner, Laser Cross-Link Technology
- **Netherlands**: PAC-3, Trilateral Frigate Program With Aegis
- **Turkey**: Bilateral Sensor Architecture Study, Possible FBX-T 2 Siting
- **Spain**: U.S.-Spain MD Working Group Established, Aegis LRS&T

**New Relations / Emphasis**

- **NATO**: ALTBMD Program Office, Feasibility Study, Interoperability
- **Ukraine**: CM And Target Cooperation, MD Workshops Held June And October 2005
- **Russia**: TMDEX Program
- **France**: Exploring Interest
- **Poland**: Interim MOA Under Discussion, Third Site Candidate
- **Czech Republic**: Third Site Candidate
- **India**: PLANX In January 2006, SIMEX 2007
- **Taiwan**: Workshops; Analysis
Results Of Mission Readiness Task Force

• Implemented findings into test program
  - Identified mission director for test events to provide end-to-end continuity
  - Defined and executed common sequence of test reviews / panels across all BMDS test activities
  - Created TE Director for Test Assurance under RTO
  - Stood up Test Configuration Control Board (TCCB) promoting total system perspective
  - Integrated MDA Safety, Quality, and Mission Assurance in test task forces
  - Strengthened Mission Assurance and Systems Engineering processes across the program
Issues For Industry

• We will place special emphasis through audits, award fee plans and program reviews on:
  - Mission Assurance
  - Systems Engineering
  - Test Readiness Certification
  - Supply Chain Management

• Integration challenges the way we have done business
  - Data sharing, proprietary technologies and procedures
  - We will adjust our acquisition strategies to better facilitate integration of BMDS

• Capability-based acquisition challenges the traditional relationship between government and industry
  - Government doesn’t have all the answers
  - International cooperation introduces new variables

• Implementing a knowledge-based funding approach which will match our spiral strategy
  - Contracts must be adaptive, flexible, and not necessarily long-term
A World With Missile Defense

- Evolving the Ballistic Missile Defense system over the next decade
  - More mobility
  - More layers
  - More redundancy
  - More inventory
  - Participation of more allies and friends

- How will this impact our world?

- How will U.S. defense goals (dissuade, assure, deter, defend), the Global War on Terrorism, and U.S. foreign policy be affected?
Persistent Surveillance

- Global command, control, battle management, communications
- More sea-based and land-based sensors
- Surveillance and track satellites
- Next-generation space-based infrared satellites

- Improved response times worldwide
- Expanded areas of engagement
- Better information on missile events
- Worldwide integration

More Mobile Assets

- 18 sea-based engagement ships
- Transportable land-based engagement capabilities (THAAD, MEADS)
- Transportable and mobile radars
- Introduction of boost phase defenses

- Flexibility to address emerging threats
- Improved crisis response
- More agile battlefield operations
- New defense layers against all missile ranges

Quick Reaction Times Improve Confidence of Leaders – “Shows of Force” to Deter Adversaries Possible
### Building Defense Robustness

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<tr>
<th><strong>50 Ground-Based Interceptors at multiple sites</strong></th>
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<tr>
<td><strong>Multiple Kill Vehicles/counter-countermeasures</strong></td>
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<tr>
<td><strong>Additional CONUS radars</strong></td>
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<tr>
<td><strong>ICBM-capable sea-based interceptors</strong></td>
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<td><strong>Redundant sensor coverage</strong></td>
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| **Bolstered interceptor inventories** |
| **Growing confidence in missile defense system** |
| **Terminal long-range defenses supplement midcourse and boost defenses** |
| **Improved homeland defense** |

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**Greater Freedom of Action to Prosecute the Global War On Terror, and Improved Defense of U.S. Populations From Off-shore Launches**
The Future Ballistic Missile Defense System

• How much defense is enough?
  - Our air, naval, and ground forces continue to evolve to meet national security requirements
  - Will the ballistic missile threat ever be stable enough so that we can stop growing or changing the system?

• Do we need to go to space with interceptors?
  - A space layer will significantly enhance system performance and responsiveness – at what point do we explore this hypothesis?
  - Will terrestrial-based BMD assets be sufficient to deal with increasingly sophisticated and shifting threats?
Take Aways

• The missile threat is real and proliferating

• Major progress towards meeting Presidential direction

• Capabilities are in the warfighters’ arsenal while concurrently supporting further development efforts
  - Adding persistence improves awareness
  - Adding mobility increases options
  - Adding inventory enhances robustness
  - Enhancing C2BMC extends the battlespace

• Carefully balancing program priorities to accommodate fiscal controls, but fielding plans and development programs are being affected

• International partners play an increasingly important role in missile defense fielding and development activities
Ballistic Missile Defense System
Limited Defensive Operations (March 2006)

- Aegis Engagement Cruisers
- Standard Missile-3 Interceptors
- Aegis Surveillance & Tracking Destroyers
- Fort Greely
  - Ground-Based Interceptors
  - Ground-Based Fire Control Suite
- Cobra Dane
- Communication Satellite
- Ground-Based Interceptors
- U.S. Strategic Command
- U.S. Northern Command Fire Control Suite
- PATRIOT PAC-3 Batteries
- National Capital Region
- U.S. Pacific Command
- DSP
Agenda

- Perspective
- BMDS Update
- MRTF Results
- Expectations for Industry
- Future of BMDS
Mission and Direction

• Develop an integrated layered Ballistic Missile Defense System
  - To defend the United States, its deployed forces, friends, and allies
  - From ballistic missiles of all ranges
  - Capable of engaging them in all phases of flight

• Presidential Security Policy Directive 23 (May 2001)
  - Begin initial fielding in 2004…continue to improve over time
  - No final fixed architecture…evolve as needed
  - International cooperation a key element

• National Missile Defense Act of 1999
  - Deploy capabilities when “technologically possible”