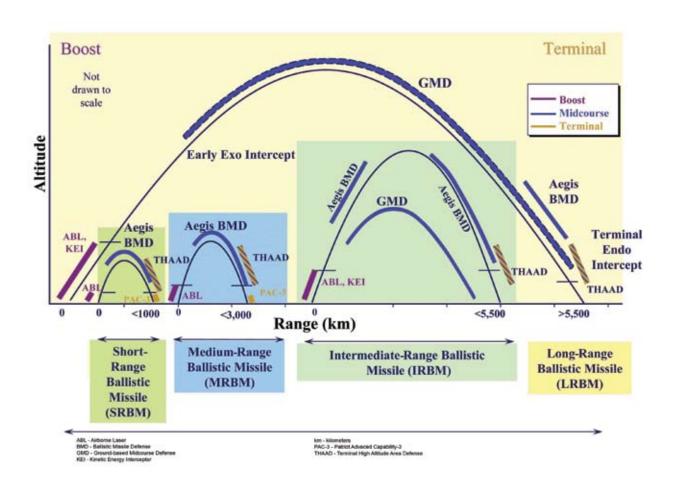
BALLISTIC MISSILE DEFENSE SYSTEMS

Ballistic Missile Defense Overview



In January 2002, the Secretary of Defense established the Missile Defense Agency (MDA) to develop defenses capable of defending the U.S., deployed forces, allies, and friends against threat ballistic missiles of all ranges, and in all phases of flight. Threat missiles are grouped by range, as follows:

- Short-range (less than 1,000 kilometers)
- Medium-range (less than 3,000 kilometers)
- Intermediate-range (less than 5,500 kilometers)
- Long-range (greater than 5,500 kilometers)

Defenses are described in terms of three phases of the threat missile's flight:

- Boost from launch to booster burnout
- Midcourse exoatmospheric flight between boost and reentry
- Terminal from reentry to impact

The Ballistic Missile Defense System (BMDS) includes elements designed to have capability against threats in a particular phase of flight:

- · Boost Phase
 - Airborne Laser (ABL)
 - Kinetic Energy Interceptor (KEI)
- · Midcourse

- Ground-Based Midcourse Defense (GMD)
- Aegis Ballistic Missile Defense (Aegis BMD)
- Kinetic Energy Interceptor (KEI)
- Terminal
 - Terminal High-Altitude Area Defense (THAAD)
 - Aegis Ballistic Missile Defense (Aegis BMD)
 - PATRIOT

For intermediate and intercontinental ballistic missile threats, KEI is shown as a boost phase system because it has a unique capability to intercept boosting threats. This requires the system be employed close to threat missile launch points. However, KEI's versatile design may have considerable midcourse capability.

Furthermore, MDA is developing additional elements and components to improve BMDS' performance and defensive capability. They will add specific functionality to an integrated BMDS, and include:

- Forward-Based X-band-Transportable (FBX-T) radar
- Sea-Based X-Band radar (SBX)
- Command, Control, Battle Management, and Communications (C2BMC) system

BALLISTIC MISSILE DEFENSE SYSTEMS

- Multiple Kill Vehicle (MKV) program
- Space Tracking and Surveillance System (STSS)

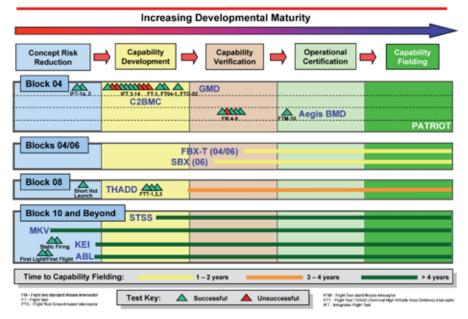
MDA uses a spiral development acquisition approach to develop and acquire the BMDS. Spiral development allows MDA to deliver missile defense capability in stages. The Agency explores, develops, verifies, certifies, and fields BMDS capabilities while conducting a comprehensive test program. Early testing - exploration and development - is element-centric. Later testing - verification, certification, and fielding - is BMDS-centric. The chart to the right defines the characteristics of each stage and their relationship to developmental testing and combined developmental and operational testing, in developing and maturing the BMDS.

Using spiral development acquisition, MDA develops technology and BMDS operational elements in two-year blocks. The BMDS Block 04 fielded a test bed architecture consisting of GMD, Aegis BMD, C2BMC (situational awareness capability only), and PATRIOT. Also part of Block 04, MDA fielded the initial FBX-T capability at Shariki, Japan, operationally designated AN/TPY-2 (FB). The BMDS Block 06 adds additional sensors, including SBX and new capability for FBX-T, and continues to evolve the C2BMC from situational awareness to battle management. The BMDS Block 08 will add THAAD to the BMDS architecture and continue the evolution of C2BMC.

| Capability | Capability | Capability | Verification | Verificat

The BMDS Block 10 and beyond currently intends to insert the technology programs into the BMDS architecture if these programs prove to have affordable and sustainable capabilities. Based on the definitions for each stage, the following chart depicts the DOT&E estimate of where each technology and developmental element maturity is today within this construct. The MDA test program is designed to mature each element over time.

Development Status of BMDS Elements - Today



This assessment report focuses on the current BMDS fielded architecture, including the sensor and technology programs, and associated developmental and combined developmental/

operational testing. PATRIOT has transitioned to the Army and is reported as an Army program.