Ground-Based Midcourse

The Ground-Based Midcourse Defense (GMD) mission is to defend against long-range ballistic missile attacks. The continuing proliferation of both ballistic missile technology and weapons of mass destruction necessitates fielding a multi layered Ballistic Missile Defense System (BMDS). During a GMD intercept, a booster missile flies toward a target's predicted location and releases a "kill vehicle" on a path with the incoming target. The kill vehicle uses data from ground-based radars and its own on-board sensors to collide with the target, thus destroying both the target and the kill vehicle using only the force of the impact. Working in conjunction with the other elements of the BMDS, GMD will contribute to the defense of the U. S. as well as its deployed forces, friends and allies.

On December 17, 2002, the President directed the Department of Defense to field initial missile defense capabilities beginning in 2004. The plan calls for fielding up to 10 GMD interceptors by 2004 and an additional 10 by 2005 (for a total of up to 20), in addition to other assets.

The BMDS Test Bed

In order to allow for more stressing testing of the BMDS, including the GMD element, MDA is developing and constructing a Test Bed that is expected to be completed by September 30, 2004. This BMDS Test Bed will allow testing at angles, speeds and conditions that closely replicate operational scenarios. The GMD element's primary objectives are: (1) to complete development of an Initial Defensive Operations (IDO) capability based on the BMDS Test Bed and augmented with additional developmental assets to begin operation in 2004-2005; and (2) to continue a robust test and evaluation program to mature GMD technologies.

Key parts of the IDO/Test Bed are planned or already under construction in Alaska, California and Colorado. The highest profile pieces of the IDO/Test Bed are located in Alaska where MDA, the U.S. Army Corps of Engineers, and several contractors have completed digging six missile silos and are constructing several support facilities. On Shemya Island, one of the most distant islands in the Aleutian chain, the existing Cobra Dane radar is being upgraded in order to support flight tests and monitor potential enemy missile launches. Additional work is planned for the Kodiak Launch Complex, on Alaska's south coast, to allow for target launches. MDA is evaluating the environmental impacts of all this work in accordance with existing laws and regulations.

The following is a closer look at the individual pieces of the GMD program, including external sensors that enhance performance:

Satellites: Defense Support Program (DSP). Air Force DSP satellites and follow-on Space Based Infrared System-High (SBIRS-High) satellites will provide the first warning of a ballistic missile launch and develop an early estimate of where the hostile missile is headed. Another satellite system, the Space Tracking and Surveillance System (STSS), is being developed to provide global tracking of ballistic missiles, and potentially assist with discerning threatening from non-threatening objects. The tracking function will fill in the gaps in other tracking coverage - allowing for earlier launches of interceptors.

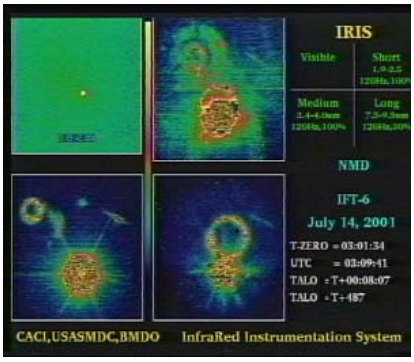
Radars: Early Warning Radars: MDA is upgrading the hardware and software of existing Early Warning Radars (EWRs) that have been used for decades to detect and track ballistic missiles targeted at the United States. The upgrades will allow the radar to more determine accurately the area where an incoming ballistic missile is headed, and

allow initial planning for an intercept. The existing radars that will be used are located in the Alaskan Aleutian Islands, coastal California, and overseas.

X-Band Radar: The X-Band Radar (XBR) is designed to search for, detect, and track enemy missiles, as well as determine which objects are warheads and which are decoys or debris. After interception of an enemy missile, the XBR can provide an assessment of the success. MDA is currently developing and constructing a sea-based XBR for the Test Bed and initial defensive operations. This radar's completion is planned for 2005.

Ground-Based Interceptor: The Ground-Based Interceptor (GBI), including both a booster missile and a kill vehicle, flies toward the target's predicted location, receives in-flight updates, and then releases the kill vehicle on a path with the incoming target. In current testing, the GBIs are launched from the Reagan Test Site in the Marshall Islands. For the Test Bed and defensive operations, MDA is currently constructing a missile field at Fort Greely in central Alaska, as well as upgrading facilities in California to install missiles there.

The kill vehicle uses on-board sensors to acquire the target and, with assistance from ground-based assets, discriminates the actual warhead from any accompanying decoys. The kill vehicle then adjusts its trajectory to collide with the target. Both the kill vehicle and the target are demolished in the collision.



GMD Fire Control and Communications (GFC/C): The GFC/C component is essentially GMD's central nervous system. It consists of the hardware, software and communications systems necessary for planning, tasking and controlling GMD. GFC/C enables personnel to understand the situation, make informed decisions, and control defense against a limited ballistic missile attack. It provides mission and engagement planning, situation assessment, system responses and centralized command and control.