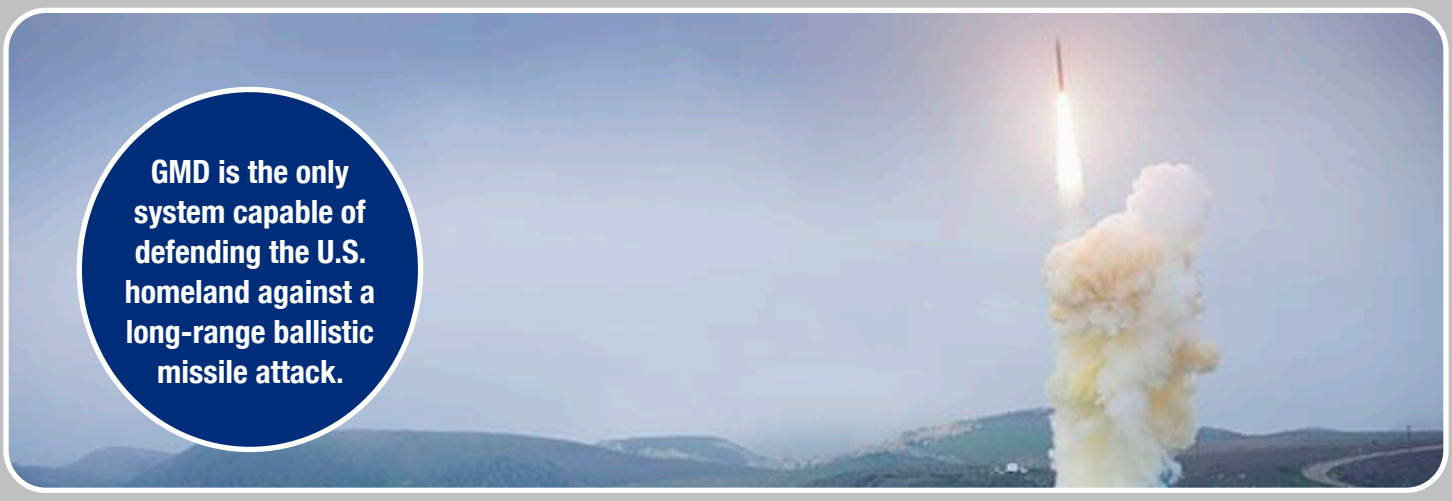
U.S. GROUND BASED MIDCOURSE DEFENSE (GMD)

MDAA
Missile Defense Advocacy Alliance

MDAA SYSTEM BRIEF #1
FEBRUARY 2015



GMD is the only system capable of defending the U.S. homeland against a long-range ballistic missile attack.

THE U.S. GMD SYSTEM IS THE UNITED STATES' LAST LINE OF DEFENSE

against a limited ballistic missile attack against U.S. territory. To continue to stay ahead of the rogue state ICBM missile threat, the system requires continued modernization, including investments in a redesigned kill vehicle, the installation of the Long Range Discrimination Radar, and enhanced tracking and discrimination capabilities and system integration.

GMD is the United States' homeland missile defense system. It is comprised of 30 Ground Based Interceptors (GBI) at Ft. Greely, AK and Vandenberg Air Force Base, CA, with an additional 14 planned to be in place by 2017.

GMD operates by launching a GBI that homes in and destroys an incoming missile in space during the middle, or "midcourse" of its flight path. The GBIs do not use explosive warheads, but destroy the incoming warhead with kinetic energy by physically colliding with it.

For GMD to maintain viability, it requires continual modernization to keep pace with the threat.

System Needs:

- **Redesigned Kill Vehicle** (RKV) for enhanced reliability.
- **Long Range Discrimination Radar (LRDR)** for better discrimination of warheads from debris and decoys.
- **Reliability Assessment and Enhancement** to existing interceptor fleet, and move to an robust annual testing cadence.
- **Better Integration** between the multiple tracking, discrimination, and command and control elements of the system.

Ground Based Interceptor Silo
Ft. Greely, Alaska

SYSTEM ELEMENTS

DSP and SBIRS Satellites detect heat signatures of enemy missile launches.

Aegis BMD Ships provide radar tracking of missiles

Upgraded Early Warning Radars (UEWR) provide additional sensor coverage and tracking

Sea-Based X-Band Radar (SBX), a mobile platform that provides tracking and discrimination

C2BMC Command and Control compiles sensor data and queues interceptors

Ground Based Interceptor (GBI) launches and is guided to incoming warhead by sensor tracking and discrimination data.

Exoatmospheric Kill Vehicle (EKV) separates from booster, locates, discriminates, and collides with enemy warhead

GMD integrates GBIs with multiple sensor platforms and command and control elements.

GMD is much more than interceptors. Sensor and command and control elements are equally vital to **track**, **discriminate**, and **destroy** an incoming missile before it can hit U.S. soil.

Tracking

Tracking is the capability to know where an enemy missile is at all times. Having robust tracking is vital in order to guide the interceptor to a position where it can destroy the missile. Multiple systems play a role in tracking including overhead satellites, sea and ground based radars and the sensors onboard the Exoatmospheric Kill Vehicle (EKV).

Discrimination

When an enemy warhead separates from a missile booster in space, it creates a "cloud" of debris, which can include decoys designed to fool defense systems. **Discrimination is the ability for the interceptor to determine which objects in the cloud are lethal, and which are not.**

The ability to track and discriminate is determined by the sophistication and completeness of radar coverage and the sophistication of the seeker onboard the Kill Vehicle.

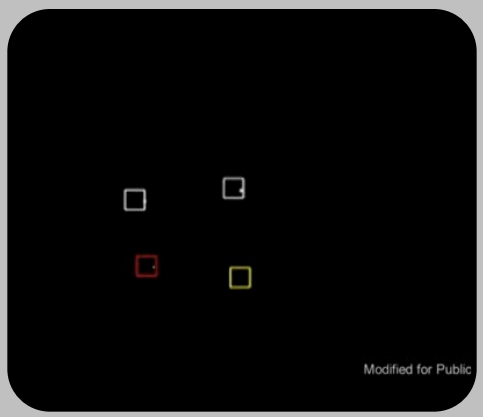
A Redesigned Kill Vehicle (RKV) and Long Range Discrimination Radar (LRDR) would greatly enhance GMD's tracking and discrimination capability.

The Need For Regular Testing

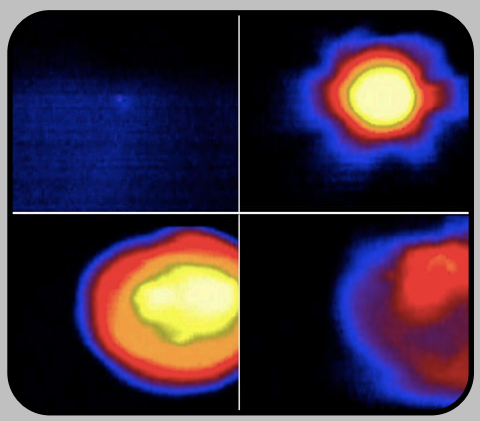
Testing is a necessary part of any engineering program. GMD is no different. As we incorporate new technologies into GMD in the coming years, these new elements must be tested in both intercept and non-intercept tests.

Successful tests are always the goal, but system engineers and operators often learn more from test failures, paving the way to make fixes that make the system more reliable.

Testing for GMD has been infrequent in recent years. **To maximize reliability, GMD should return to an annual testing cadence.**



View from the Kill Vehicle Sensor as it discriminates between the warhead, debris, and decoys. June 22, 2014



Infrared View of Exoatmospheric Kill Vehicle colliding with and destroying a simulated warhead in space. June 22, 2014

A Strategic Necessity in Today's World

- The GMD system provides a **bulwark against attempts by rogue states states to exert influence over U.S. foreign policy and freedom of action** by threatening the U.S. homeland with long-range ballistic missiles.
- Protecting the U.S. homeland from ballistic missiles **increases the credibility of U.S. security guarantees** to its allies, enhancing strategic stability in otherwise volatile regions, and helps to prevent nuclear proliferation among U.S. allies and partners.
- GMD **counteracts the strategic benefits of long-range missile acquisition** by U.S. adversaries, deterring them from spending resources to develop long-range missile technology.
- GMD provides **protection for U.S. citizens** in the event deterrence fails, or against non-deterrable threats such unauthorized or accidental missile launches.

Keeping Ahead of the Threat

Building offensive missiles is technologically easier, faster, and cheaper than building defenses to counter them. This is why it is crucial for policymakers and strategist to anticipate rogue state ballistic missile threats on the horizon, and make adequate investments to counter them before they can be fully realized.

Fielding a system that is one or two steps ahead of the threat is more cost effective and provides greater deterrence and protection than playing catch-up to a threat that has already fully materialized.

Want to know more about GMD?

Visit MDAA's website at

www.missiledefenseadvocacy.org

or contact Ian Williams at

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THE THREAT

North Korea's Taepo Dong II is believed to have a range of over 5500 km, capable of reaching U.S. territory.

North Korea's road mobile KN-08, also ranged at 5,500+ km, is currently in development.

Iran's space launch program has demonstrated technical competency that could easily be applied to an ICBM breakout program.