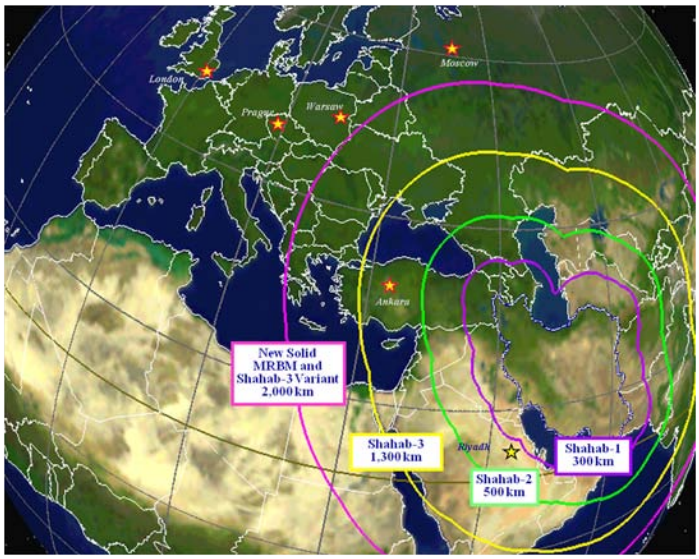
AEGIS BALLISTIC MISSILE DEFENSE
FTM-15 FACT SHEET

Background

Today forward deployed American soldiers, sailors, airmen and marines are at risk from short to intermediate range ballistic missiles located in North Korea and Iran. The dire consequence of a ballistic missile, armed with Weapons of Mass Destruction, reaching our forward deployed forces demands that we have multiple intercept opportunities against each launched ballistic missile. No single Service system can engage ballistic missiles of all ranges through all phases of flight. To provide such a capability, the U.S. Armed Forces need to conduct ballistic missile defense warfare through integrated, layered defense.



Integrated BMD capabilities draw on space-, land-, and sea-based assets operated by multiple Services. These capabilities provide the best sensor information on the enemy missile's track and a more diverse and effective set of weapon options for the Combatant Commander to defeat the attack - all connected by a unified Command and Control, Battle Management, and Communications (C2BMC) system. As stated by Lt. General Ronald Kadish, the first Director of the Missile Defense Agency (MDA), the Ballistic Missile Defense System (BMDS) is based on three missile defense axioms;

- Geography counts
- The farther forward your sensors, the more battlespace you have
- The farther forward you attack, the more advantageous it is

Geography Counts

Stationing, or the location, of missile defense assets is critical to defeating the threat. Due to the uncertainty of the threat, we may not know when and where the enemy will strike. Thus, it is advantageous if the missile defense assets are mobile and easily transportable. Aegis BMD ships are mobile; they operate in international waters; can easily change course and location to reposition in response to a crisis; and surge to bring increased firepower to bear on the problem.

In addition to the mobile, deployed SPY-1 sensor on Aegis BMD ships, MDA has developed a transportable X-band radar, designated as the AN/TPY-2 radar, to provide early warning, detection and tracking of ballistic missiles. The Aegis SPY-1 and TPY-2 radar track information is transmitted to other BMDS sensors and weapon systems, via the C2BMC system, to facilitate engagement of threats.

The Farther Forward Your Sensors, the More Battlespace You Have

Within 30 minutes, an intercontinental ballistic missile could be launched from any location in the world and strike somewhere in the United States. To defeat a regional or theater ballistic missile, you would have even less time. A forward deployed sensor would provide early warning of a ballistic missile launch, thereby increasing situational awareness. Tracking ballistic missiles and transmitting track data to the BMDS extends the battlespace, enabling earlier detections by other sensors or the launching of weapons based on remote track data, winning back critical reaction time.

The Farther Forward You Attack, the More Advantageous it is

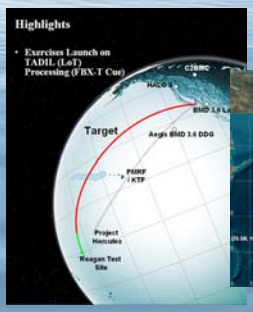
Building upon the second axiom, increased battlespace enables earlier fire control solutions, allowing the defender to attack earlier, at longer ranges and provides the opportunity to re-engage, increasing depth of fire and decreasing the likelihood of a ballistic missile penetrating the defenses.

Flight Test-Standard Missile-15 (FTM-15) demonstrates the BMDS capability for an Aegis BMD equipped ship to react to offboard track information to fire an Standard Missile-3 (SM-3) Blk IA thereby extending the battlespace, winning back critical reaction time, and enabling a longer range intercept.

"Build a Little, Test a Little, Learn A Lot"

Previous BMDS events which explored Aegis BMD's ability to send and receive offboard sensor information to support fire control operations.

Glory Trip 193
Feb 07



Aegis BMD track data transmitted to C2BMC and simulated launch on remote DDG track data

FTX-02 - Mar 07

Aegis BMD simulated launch of a SM-3 missile using remote track data

Burnt Frost
Feb 08

Launched SM-3 on remote data from land-based sensors

FTX-03 - Jul 08

Successfully received a target launch cue from AN/TPY-2 radar

FTG-05 - Dec 08

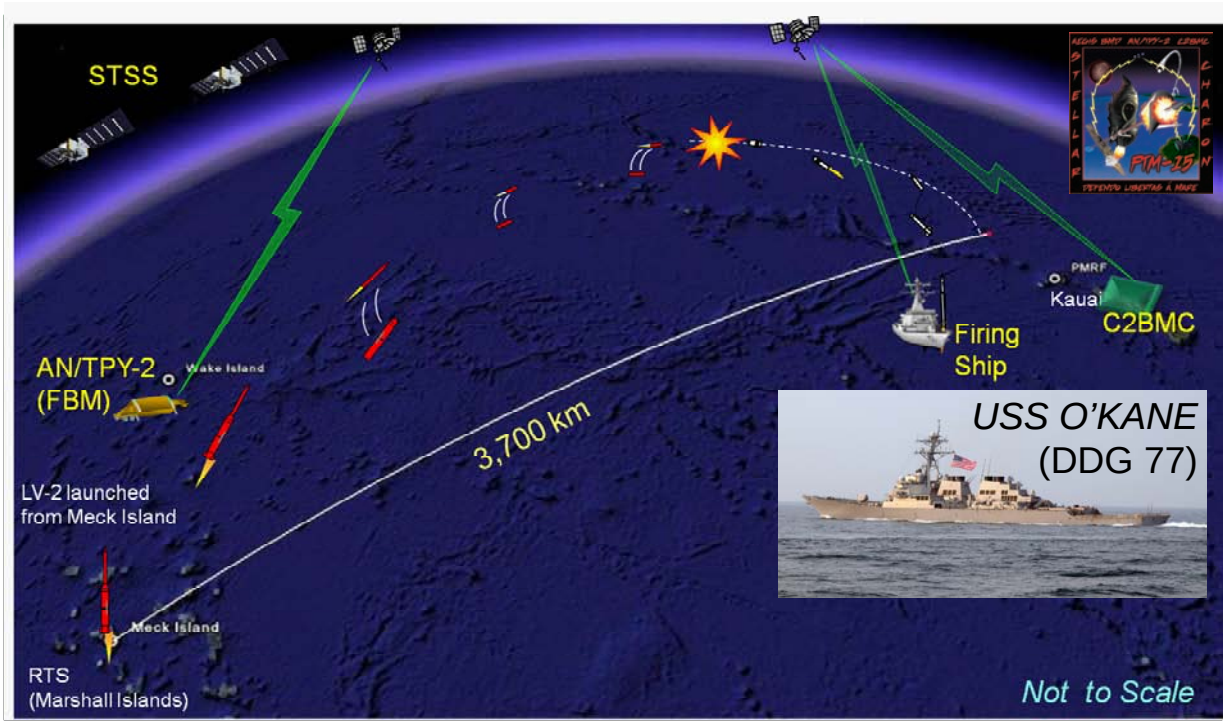
Aegis BMD ships exchanging track data with TPY-2 radar

FTG-06a - Dec 10

Successful simulated Aegis BMD Launch on Remote engagement

Ship to ship track information exchanges occur routinely.

FTM-15 Scenario



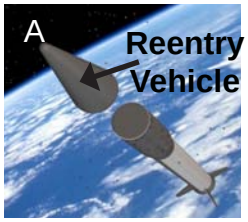
The primary objective of FTM-15 is to intercept a separating Intermediate Range Ballistic Missile (IRBM) target with a Standard Missile-3 (SM-3) missile, launching the SM-3 using remote track data from the AN/TPY-2 (FBM) radar processed and forwarded by the C2BMC element of the BMDS.

FTM-15 begins as the operational forces receive intelligence that hostile forces are making preparations to take aggressive action against a friendly nation. These BMD capable forces are to protect this hypothetical friendly nation from ballistic missile attacks. The Navy's *USS O'KANE* (USS DDG 77) and an AN/TPY-2 (FBM) radar are placed on BMD alert status. Using intelligence information, the TPY-2 radar calculates and begins searching using a recommended search plan. To ensure operationally realistic testing, the timing of the target launch is not revealed to any of the participants. The IRBM target is launched from Meck Island, located at the Reagan Test Site (RTS) on Kwajalein Atoll in the Marshall Islands.

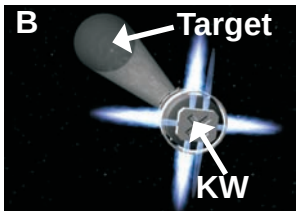
The TPY-2 radar, located on Wake Island for this test detects the target as it enters the radar's search sector. The TPY-2 acquires the target, tracks and transmits the track data to the BMDS via C2BMC. The C2BMC suite located at Pacific Command Headquarters in Hawaii associates the TPY-2 track data to the launch of an IRBM. C2BMC reports the track data to the Link 16 network. *USS O'KANE's* Aegis BMD Weapon System processes the Link 16 messages and computes a fire control solution for intercepting the target and begins a cued search for the IRBM target with its AN/SPY-1 radar.

The target flies a ballistic trajectory. After rocket motor burnout occurs, the reentry vehicle (RV) or target warhead is ejected resulting in a cloud of separation debris (inset A). If not detected by the SPY-1 radar, *O'KANE's* Aegis BMD Weapon System continuously processes TPY-2 track data via Link 16 and computes updated fire control solutions. *O'KANE's* crew launches the SM-3 Block IA missile using TPY-2 (remote) track data. *O'KANE's* SPY-1 radar acquires and tracks the SM-3 missile throughout its flight as it continues its cued search for the IRBM target.

After SM-3 booster burnout and during second stage rocket operation, the weapon system continuously uplinks guidance commands derived from TPY-2 track data to the missile. The second stage Dual Thrust Rocket Motor separates after motor burnout. Pulse 1 of the Third Stage Rocket Motor (TSRM) fires, providing the axial thrust required to maintain the missile's trajectory. The TSRM's Attitude Control System (ACS) performs a pitch maneuver, ejecting the nosecone and exposing the Kinetic Warhead's (KW) Infra-Red (IR) seeker. The ACS re-aims the missile towards the target. The TSRM executes the Pulse 2 burn.



As the IRBM target continues along its trajectory, *O'KANE's* SPY-1 radar detects and acquires the ballistic missile target and associated objects. The Aegis weapon system correlates Aegis SPY tracks with TPY-2 tracks. Based on SPY (local) track data, the weapon system uplinks track information to the missile. With uplink commands, the weapon system positions the SM-3 missile so that the target is in the center of the IR seeker's field of view.



After ejection of the KW from the missile, the KW's Solid Divert and Attitude Control System (SDACS) fires to maintain the necessary heading for the IR seeker to acquire and track the RV (inset B). The KW correlates its infrared tracks to those previously received from the weapon system to identify the RV from other objects. Upon acquiring the RV, the KW performs divert maneuvers to approach the RV. If additional propulsion is needed, SDACS pulses one and two are available. Additional refinement of the intercept calculation are made by the KW and final intercept divert maneuvers are executed. The KW collides with the RV, destroying it with the sheer force of impact (inset C).

FTM-15 is the foundation of integrated BMD and fulfills the missile defense axioms of forward stationing sensors and attacking the threat as far forward as possible. This flight test demonstrates extending the battlespace and extends Aegis BMD's original design to intercept a longer range threat using netted sensor information.

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