

Aegis Missile Defense: A Proven Capability

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Introduction

The Aegis Ballistic Missile Defense (BMD) system took another significant step forward with the latest successful test of its tracking and interception capabilities, following on a long and highly successful series to date. Indeed, this test achieved two hitherto-untried operational milestones: simultaneously engaging multiple ballistic missiles, while also giving a close ally, Japan, an opportunity to participate to verify one of its Aegis-equipped warship's ability to perform this task as well.

Aegis BMD - Ready for Prime Time

Aegis BMD is a proven system, capable of intercepting short- and medium-range ballistic missiles in the midcourse phase of their flight. It has now achieved eleven successful kills out of thirteen targets, in twelve flight tests to date.¹ This represents a commendable 85 percent success rate, and there have been a further sixteen successful target-tracking tests. Importantly, these tests include three successful interceptions of warheads as they separated from their boosters, demonstrating not only a sophisticated sensing/processing architecture, but more importantly, extending Aegis' midcourse defense capabilities earlier into the post-boost-phase of a target missile's flight, and increasing the total time in which it can target and intercept a ballistic missile.² The latest test, on November 6, 2007 (designated FTM013), achieved a first-ever double-interception of ballistic missile targets outside the atmosphere.³

Aegis BMD provides the U.S. Navy with defensive power projection worldwide, with its attendant security-stabilizing attributes. This mobility allows the U.S. to protect its forces, friends and allies from ballistic missile attack at points all across the globe. Introducing such capabilities alters the strategic calculus in such a way as to deter the use and acquisition of ballistic missiles. The Navy currently plans to deploy eighteen ships (three cruisers and fifteen destroyers) with the Aegis BMD system by the end of 2009.⁴

Importantly, the Aegis BMD missile defense system is an operational Navy weapon system, not a prototype; it was certified by the Navy for operational duty in September 2006.⁵ Missile Defense Agency (MDA) Aegis Program Director Rear Admiral Alan Hicks describes this milestone as a "tactically certified capability, not a contingency capability, but a standard configuration to the fleet with deployment rounds available for load-out, available whenever and however the nation needs to use it."⁶

Aegis is capable of defending wide swathes of ocean and adjoining territory. In addition, the Aegis system is integrated into the overall BMD radar- and space-based surveillance network, enabling it to see thousands of miles away.⁷ As a result, the total area that can be covered by a single Aegis BMD warship can extend out to thousands of kilometers, primarily in the direction of the incoming ballistic missile, and depending upon the range of the threat that is being defended against. This would enable a seemingly insignificant five Aegis BMD warships to defend virtually the entire Continental U.S., as shown in Figure 1. Figure 2 shows a Navy warship launching a Standard SM-3 interceptor missile. The SM-3 kinetic interceptor warhead is shown in Figure 3.

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Figure 1 – Aegis Coverage for Continental U.S.⁸

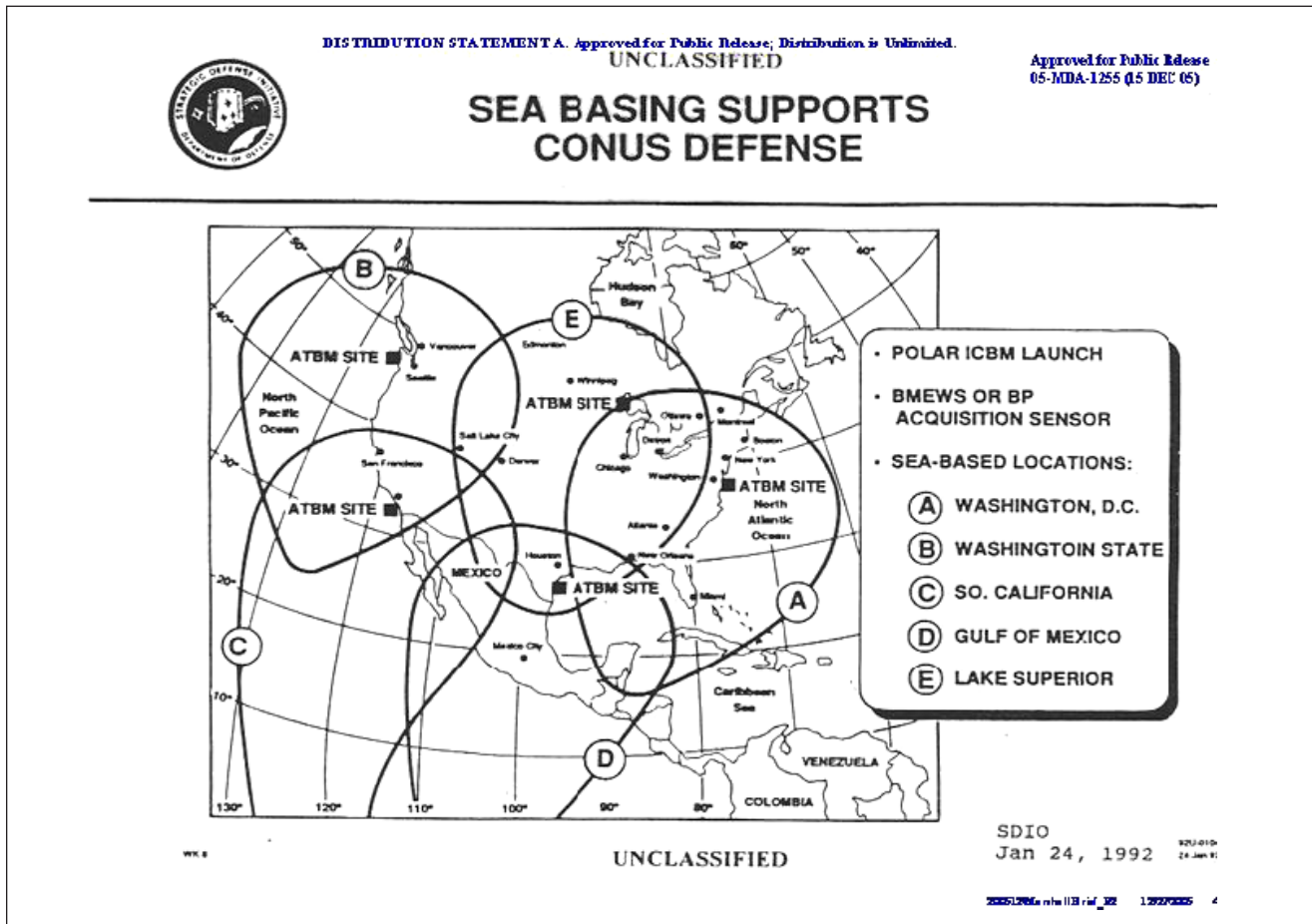


Figure 2 – Standard SM-3 Missile Launch from Aegis Cruiser *USS Shiloh*⁹





Figure 3 – Aegis/Standard SM-3 Kinetic-Kill Interceptor¹⁰

The Latest Test

The Aegis testing program has always been very measured and methodical. Testing started with basic launch and flight tests, then progressed to close-pass flight tests, and then to actual interceptions. These are now being followed up on with increasingly complex interception scenarios, such as three of the aforementioned successful tests that involved distinguishing a ballistic missile warhead from its booster, just as the two are separating. Other testing has included simultaneously engaging cruise and ballistic missiles successfully.¹¹ It should also be remembered that even a “failed” test could yield vital insight into making the tested system function properly, as is now obviously the case for Aegis. Indeed, the last “failed” test was due to operator error. This cautious yet progressively more challenging pattern of testing is evident throughout the history of the Aegis program, which spans nearly a decade,¹² and continues in the latest test (FTM-13) involving a double-interception of two unitary (i.e., non-separating) ballistic missile targets.¹³

The latest test increased the complexity of the threat to be countered, challenging Aegis’

ability to handle likely real-world multiple-missile volley attacks. Specifically, the *USS Lake Erie* was tasked with defending against two nearly-simultaneously-launched ballistic missiles. Another element of this real-world test was the participation of the Japanese navy ship *Kongo*, which did everything short of firing missiles at these same targets.¹⁴ Interestingly, the *Kongo*’s full dress rehearsal is a prelude to its reversing roles with the *Lake Erie* in a subsequent test, planned for this December, in which the *Kongo* will be the primary sensor-tracker-shooter, while the *Lake Erie* will perform the intensive-observer role.¹⁵

Japan and Missile Defense

Missile defense became a topic of great importance for Japan when North Korea fired a long-range ballistic missile over Japanese territory in 1998. Then-Defense Agency chief Fukushima Nukaga said, “Along with the establishment of a surveillance radar network, we want to work with the United States to build an interception mechanism as soon as possible.”¹⁶ The primary threat driving this earliest-possible deployment was and continues to be North Korea; Japan’s 2007 annual defense report states that North Korea’s ballistic missiles “are now regarded as more practical” and “North Korea is improving its capability of managing ballistic missiles. It is considered that North Korea is trying to further extend their firing range.”¹⁷ The Report summarizes this issue as follows:

“Concerns over North Korea’s nuclear weapons and ballistic missiles have grown more serious. North Korea launched ballistic missiles in July of last year, and announced in October that it had conducted an underground nuclear test. These actions are seen as clear

Figure 4 – Aegis Deployments for the Defense of Japan²¹


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Aegis BMD

- **The 21" SM-3 Missile (SM-3 Block II / IIA) in Combination with Remote Data Provided by BMDS Sensors Upgrades will**
 - Increase the Area That Can be Defended
 - Increase the Probability of Kill Against a Larger Threat Set
- **Aegis BMD Performance Upgrades will**
 - Exploit the Capability of the SM-3 Block II / IIA
 - Modifications will First Increase Velocity Then Increase Divert
 - Exploit Use of Threat Track Data From BMDS Sensors
- **PB06 Program Assumes Japan Participation at 50%**
- **PB06 Program Assumes Development Commences FY07**



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threats to the peace and security not only of Japan but also of the international community.”¹⁸

The Japanese government began implementing this goal early the next year, with both procurements and technology-sharing programs proceeding between itself and the U.S., including land-based Patriot PAC-3 batteries, and upgrading four Aegis destroyers with SM-3 missiles and related radars.¹⁹ The *Kongo* was the first of these ships to be built, and to have its upgrades completed.²⁰ Coverage of the Japanese Islands can be achieved with as few as three Aegis BMD warships, as illustrated in Figure 4.

Good, but More are Needed

As mentioned previously, the Navy currently plans to deploy eighteen ships with the Aegis BMD system by the end of 2009.²² Current planning for these ships focuses on their deployment around the Pacific, i.e., countering the North Korean ballistic missile threat. In a

recent interview, however, Adm. Hicks indicated that the current force-level planning for Aegis BMD warships might not suffice to counter the Iranian threat as well. “One of the concerns I have today is that if we had to surge for both a North Korean and Iranian scenario, you could end up taking ships [that would be used for] defense against North Korea.”²³ Adm. Hicks implies that the Iran mission will require additional Aegis BMD-equipped ships and that these additional ships will be required earlier

than called for in the current deployment timetable.²⁴

Conclusion

Aegis’ latest test showed that the system can detect, engage and destroy multiple ballistic missiles simultaneously. All of Aegis’ tests to date are proof that it is capable of doing its required job of defending against ballistic missiles. The program is ready and able to defend the U.S.

Aegis BMD is only going from strength to strength, proving the validity of the technology and strategy of missile defense. After decades of starts and stops, BMD has finally come of age, fulfilling its potential in defending the country against the threat of ballistic missile attack. This protective capability is well on its way to the hands of close allies such as Japan as well. However, doubts remain as to whether or not there will be enough ships available to provide the needed protection in the increasingly uncertain years to come.

Notes

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