

THE AEGIS BMD GLOBAL ENTERPRISE

A “High End” Maritime Partnership

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For more than three decades, beginning soon after the end of World War II, the United States and the Soviet Union faced off against each other. The concept of “mutual assured destruction”—MAD, the U.S. threat of massive retaliation to a Soviet first strike—became America’s Cold War de facto strategic defense policy. In March 1983, however, President Ronald Reagan asked whether ballistic missiles could be destroyed before they reached the United States or its allies, thus catalyzing efforts for a national ballistic-missile-defense program that would undermine the need for MAD. That same year, the U.S. Navy commissioned USS *Ticonderoga* (CG 47), the first of what is to become a fleet of more than eighty Aegis warships. In 2012, these trends have converged, and Aegis ballistic-missile defense (BMD) is an increasingly important component of a robust national BMD System (BMDS).

National BMDS has morphed from President Reagan’s original vision of a system to deter and, if necessary, defeat Soviet intercontinental ballistic missiles (ICBMs) to one focused on deterring or defeating shorter-range ballistic missiles

fired at the United States or its allies and friends by rogue nations or terrorist groups. So too the “pillars” of the national BMDS have changed. As other air, ground, and space pillars have advanced in fits and starts, and as related programs have been initiated and, sometimes, canceled, the seaborne component of national BMDS has become an increasingly central component of U.S. regional ballistic-missile defenses. Aegis BMD is now moving toward a role in the defense of the American homeland as well.

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As more countries—many with hostile intentions toward U.S. allies in the Asia-Pacific region and Europe—have acquired the requisite technologies during the past three decades, many U.S. friends and allies have been obliged to contend with the threat of ballistic missiles armed with weapons of mass destruction (WMD). In northwest Asia, both Japan and Korea have built or are building Aegis BMD-capable ships. North Atlantic Treaty Organization (NATO) allies in Europe have been dealing with ballistic-missile defense through the alliance’s Active Layered Theatre Ballistic Missile Defence (ALTBMDB) program and, since 2009, also through the European Phased Adaptive Approach (EPAA), comprising “Aegis Afloat” and “Aegis Ashore.”

This new approach now also includes forward-basing four Aegis BMD-capable warships in Rota, Spain. “With four Aegis ships at Rota, the alliance is significantly boosting combined naval capabilities in the Mediterranean, and enhancing our ability to ensure the security of this vital region,” Secretary of Defense Leon Panetta noted on 5 October 2011.¹

These ships will also support NATO’s critical efforts to build effective missile defense. Alongside important agreements that were recently concluded with Romania, Poland, and Turkey, Spain’s decision represents a critical step in implementing the European Phased Adaptive Approach. The United States is fully committed to building a missile defense capability for the full coverage and protection of all our NATO European populations, their territory and their forces against the growing threat posed by ballistic missiles.

Today the steady growth of Aegis-capable ships in the U.S. Navy—as well as an increasing number of world navies fielding such ships—presents new opportunities and challenges. The portion of the Navy’s fleet that is capable of ballistic-missile defense is increasing from twenty-one ships now to a planned ninety-four in 2024.² Given the well-publicized demand for these assets, Aegis BMD unquestionably is becoming an increasingly important component of BMD planning and operations of the unified commands’ combatant commanders.

But some are questioning whether the Navy can afford to see multimission Aegis BMD ships abandon general-purpose, Navy-specific missions—such as air, surface, and subsurface defense and precision strike for carrier and expeditionary strike groups—to support the combatant commanders directly with their BMD capabilities.³ Some view Aegis BMD through the same lens as they would the strategic ballistic-missile submarine program and ask whether Aegis BMD is a mission the nation needs but the Navy cannot afford. However, Aegis BMD is an increasingly important element of the nation’s maritime strategy, and it differs from the ballistic-missile submarine in a way that enables Aegis BMD to satisfy both combatant-commander ballistic-missile-defense demands and Navy general-purpose requirements.⁴

Moreover, the Navy and the nation have an opportunity to leverage more fully Aegis BMD capabilities to provide territorial defense as well as protection of coalition naval task forces. The vision, first expressed in 2005, of a former Chief of Naval Operations, Admiral Michael G. Mullen, of a “thousand-ship navy”—now transformed into a Global Maritime Partnership (GMP), in which nations and navies increasingly work together to ensure security of the global commons—is reaching fruition as the U.S. Navy works with increasing regularity with coalition partners in global and regional partnerships. Because some of these countries are acquiring Aegis-equipped ships, a nascent “Aegis Global Enterprise” is evolving, in which navies work together to capitalize on the capabilities of these ships for integrated fleet air defense and even ballistic-missile defense.

The vast majority of GMP missions, however, have been on the “low end” of, or completely outside, the “kill chain”—target identification, dispatch of forces, decision and order to attack, and destruction of the target. Such tasks as humanitarian assistance, disaster relief, and antipiracy patrol dominate the shared mission set. With the increasing threat of ballistic missiles that can be armed with WMD, however, the Aegis BMD capabilities present in the navies of U.S. allies and friends can now provide the Global Maritime Partnership with a means to address the “high end” of the kill chain with combined, coordinated, ballistic-missile defense: the Aegis BMD Global Enterprise.

This potential is already manifest in the Asia-Pacific region in the close working relationship between the United States and Japan. Korea and Australia could well join this Aegis network soon, giving the four governments the means to address not only territorial BMD but also coordinated BMD of fleet units operating together. In Europe, plans are well along to provide robust territorial defense of European nations with ALTBMD and the EPAA. Together, these systems provide a nascent BMD capability today and promise an even more robust capability as the EPAA evolves over the next decade and a half.

But as demonstrated in Iraq, Afghanistan, and now Libya, NATO and the nations of Europe have equities often well beyond the territorial boundaries of the European continent. Also, a European military deployed beyond Europe’s borders will always have a naval component. This is therefore a propitious time to begin to link European allies more completely into an Aegis BMD Global Enterprise in much the same way the U.S. Navy is linked to its Asia-Pacific partners—Japan today, Korea soon, and thereafter Australia in the near future—in a high-end Aegis BMD Global Maritime Partnership.

A BMD IMPERATIVE

The need for effective BMD has increased in the twenty-first century. More than thirty countries deploy ballistic missiles today, compared with only nine in 1972.⁵

Potential enemies possess both ballistic missiles and weapons of mass destruction, and today's rogue leaders view WMD as weapons of choice, not of last resort. In 2007, the last year for which complete records are available, potential adversaries launched 120 ballistic missiles in tests and demonstrations. These foreign ballistic-missile launchings, especially in the short-to-intermediate-range category, occurred particularly in the People's Republic of China, North Korea, and Iran.

The broadened ballistic-missile threat, moreover, crosses strategic-, operational-, and tactical-level boundaries. Since the inception of U.S. BMD systems in the late 1980s, the main driver of their current versions—including Aegis BMD—has been the threat posed by rogue nations like Iran and North Korea. Today, it is Iran's organic missile development that poses perhaps the most immediate, technically developed threat to the interests of the United States and its allies and friends. Several midrange Iranian ballistic missiles have been launched over the past several years.⁶ In 2011, Tehran launched numerous ballistic missiles during its GREAT PROPHET exercise. Some of these missiles were capable of striking American bases in the region as well as Israel, the Arabian Gulf states, and Turkey.

The threat from Iran's ballistic-missile developments takes on new urgency when juxtaposed with that nation's WMD program. Then-CIA director Leon Panetta warned in 2010 that it could be a mere two years before Iran was able to threaten other states with nuclear warheads mounted on ballistic missiles.⁷ Likewise, the Defense Intelligence Agency has reported that Iran could field a WMD-armed ICBM capable of reaching the United States by 2015.⁸ Coupled with its determination to acquire WMD, it is Iran's missiles that pose the gravest threat to U.S. and allied interests and to Middle Eastern, South Asian, and European allies—an assessment underscored by the International Atomic Energy Agency in November 2011.⁹

Ballistic-missile threat planning at both the regional and strategic levels must also take into account the Democratic People's Republic of Korea, which already has conducted a nuclear weapon test. North Korea possesses a growing ballistic-missile force that includes short-range Scud C, medium-range No Dong, and intermediate-range Taepo Dong 1 missiles, some of which have been transferred to other nations as well. South Korean defense minister Kim Kwan-Jin told his country's parliament in June 2011 that North Korea may have already developed nuclear warheads small enough for ballistic-missile payloads. Likewise, former U.S. defense secretary Robert Gates in 2011 said that North Korea's missiles and nuclear weapons would pose a threat to the United States within five years.¹⁰

The actual pace of Iranian and North Korean intercontinental-range weapon development is still the subject of debate, at least in open sources. There is no

doubt, however, that the ballistic-missile threat at the regional or theater level is burgeoning. As the then director of the Joint Integrated Missile and Air Defense Organization, Rear Admiral Archer Macy, told a congressional subcommittee, “Congress and our warfighters have said the most pressing threat for our deployed forces today is the increasing number of Short Range Ballistic Missiles (SRBMs) and Medium Range Ballistic Missiles (MRBMs). Without going into classified details, suffice it to say that the sheer number and types of these threats grows [*sic*] daily and the nation needs to find a way to deal with them.”¹¹

As is the case with the ICBMs that they aim to develop, Iran and North Korea undoubtedly intend to create “strategic” effects with short-to-intermediate-range weapons in their own neighborhoods. In some scenarios, they expect their ballistic-missile forces to generate concrete, operational-level military effects as well, particularly in antiaccess and area-denial contexts.

Iran and North Korea are not alone in leveraging this aspect of potential ballistic-missile employment. China also is crafting an antiaccess/area-denial strategy for the western Pacific based in part on the operational-level use of ballistic missiles. As underscored recently in these pages, “China seeks the capacity to find U.S. aircraft carriers roughly a thousand miles from the mainland and to attack them with homing ASBMs (antiship ballistic missiles).”¹² The most prominent aspect of this threat is China’s development of the world’s first “carrier killer” ballistic missile, the DF-21D. Another commentator has declared, “The DF-21D is the ultimate carrier-killer missile.”¹³

Indeed, as *The Economist* has pointed out, “The Pentagon has described China’s programme as ‘the most active land-based ballistic- and cruise-missile programme in the world.’ Missiles are good value. Compared with a fully equipped aircraft-carrier, which might cost \$15 billion–20 billion, a missile costs about \$1m. . . . And American strategists are closely watching an experimental anti-ship ballistic missile with a manoeuvrable warhead, which could make it hard for American fleets to approach the Chinese shore.”¹⁴ A January 2011 *New York Times* editorial captured the level of concern regarding China’s emerging capabilities:

Beijing’s drive to extend its military and territorial reach is making America’s close allies in the region nervous and raising legitimate questions about American diplomacy and future military procurement. The commander of America’s Pacific forces recently revealed that China could soon deploy a ballistic missile capable of threatening American aircraft carriers in the region. The Pentagon has a long history of hyping the Chinese threat to justify expensive weapons purchases, and sinking well-defended ships with ballistic missiles is notoriously hard. But what should rightly concern American military planners is not so much the missile but the new Chinese naval strategy behind it. China seems increasingly intent on challenging United States

naval supremacy in the western Pacific. At the same time it is aggressively pressing its claims to disputed offshore islands in the East and South China Seas. Washington must respond, carefully but firmly. The Pentagon must accelerate efforts to make American naval forces in Asia less vulnerable to Chinese missile threats by giving them the means to project their deterrent power from further offshore.¹⁵

Some would downplay the threat posed by China and the DF-21D missile, arguing that—as a result of the “Walmart Factor” that intertwines the two economies—state-on-state conflict with China is not likely.¹⁶ However, China needs only to make the likely cost to the United States of intervening in western Pacific affairs—to counter Chinese threats against Taiwan or bullying of neighbors over disputed claims in the South China Sea—high enough to render intervention no longer a reasonable deterrent.¹⁷ Moreover, China’s increasing dependence on Mideast oil creates plausible scenarios in which it would export the DF-21D to countries like Iran. Given the marginal success of ongoing nonproliferation efforts, DF-21Ds could find their way to yet other governments or even to transnational or terrorist groups with animus toward the United States, its allies, or friends.

To counter the most pressing part of this spectrum of ballistic-missile threats—states already possessing WMD-armed ballistic missiles—the United States has fielded an initial national-level BMDS, integrating land, sea, air, and space elements. The first priority of the BMDS implementation strategy—establishing a limited defensive capability against North Korean ballistic missiles—has largely been achieved, with Patriot Advanced Capability–3 (PAC-3) batteries, the Ground-Based Midcourse Defense (GMD) system, the forward-deployed AN/TPY-2 radar, and Aegis BMD ships for long-range search, cueing, and engagement.

The Navy’s contribution, built around the Aegis weapon system, to U.S. ballistic-missile defenses has grown in importance in recent years, even as national-level BMDS has expanded to encompass other potential threats. The Aegis BMD system has been integrated with fleet and joint force war-fighting standards and BMDS command, control, battle-management, and communications (C2BMC) elements. Aegis BMD interoperates with ground-, air-, and space-based sensors and other in-theater assets, including the Terminal High-Altitude Area Defense (THAAD) system.

The Aegis weapon system’s adaptability has enabled the Navy to add improved hardware and software to successive Aegis “spiral” (phased) upgrades. The Aegis Combat System today consists of four major components: the AN/SPY-1 radar, the Aegis weapon system, the Mark 41 vertical-launching system (VLS), and the Standard surface-to-air missile family. Aegis BMD capability receives “block upgrades” every two years, increasing its capabilities at each step. The present configuration of Aegis BMD, Aegis 3.6, includes the BMD weapon system teamed with the advanced SM-3 Block IA missile.

The success of Aegis BMD arises from an acquisition strategy supported by a rigorous systems-engineering and integration approach and fueled by substantial and steady investment in baseline and upgraded system development. The Aegis weapon system represents nearly fifty years of research, development, testing, and real-world performance, and its missiles more than sixty years. All this undergirds Aegis BMD. This success can be seen in the results of its test program, which as of late 2011 has involved twenty-six live firings at sea since January 2002. These tests have become progressively more challenging and operationally realistic and have enjoyed unprecedented success: twenty-one hits in twenty-six shots, an 81 percent success rate, in spite of the fact that through 2011 the Aegis program accounted for only 10 percent of annual Missile Defense Agency (MDA) budgets.¹⁸

The twenty-fifth test—designated Flight Test Mission (FTM) 15—occurred on 15 April 2011, when the MDA conducted the first-ever “launch on remote” test of the system against an intermediate-range “separating target,” a warhead separating from its booster missile. In FTM-15 the guided-missile destroyer USS *O’Kane* (DDG 77), with a standard Aegis BMD system, fired a Standard Missile-3 Block IA missile in response to remote data provided by a forward-based AN/TPY-2 radar. This pitted for the first time an in-service SM-3 Block IA missile against an intermediate-range (1,800–3,400 miles) modified Trident I/C-4 ballistic-missile target, an LV-2. The demands of this test were well beyond Aegis BMD’s original design, which focused on short- and medium-range threats. The LV-2 had flown in two previous BMD live-fire tests but had not been hit—until FTM-15.

Importantly, FTM-15 used technologies and systems that are at sea and in service *today*. There were no changes to *O’Kane*’s BMD suite for the test. Moreover, the success unveiled new possibilities for Aegis BMD using technologies and systems already available. Also important about FTM-15 is that it linked the ship to remote sensor data to increase coverage area and responsiveness. Once this capability is fully developed, interceptors—no longer constrained by the detection range of the Aegis radar against an incoming missile—can be launched sooner and fly farther.

The twenty-sixth Aegis BMD flight test, FTM-16, occurred on 1 September 2011. The primary goal was to track and engage a separating ballistic-missile target with the Aegis BMD 4.0.1 Weapon System and the SM-3 Block IB missile, the block-upgrade successor of the SM-3 Block IA.¹⁹ FTM-16 was the first flight test of the Block IB. While the test yielded no intercept, USS *Lake Erie* (CG 70) successfully detected and tracked the target and guided the SM-3. FTM-16 highlighted the difficulties and complexities of the ballistic defense mission. In accord with the Aegis “build a little, test a little, learn a lot” philosophy, the Navy and

the MDA will glean important information from FTM-16, incorporate it, and continue to advance Aegis BMD capabilities.

Aegis BMD's accomplishments are even more impressive in light of the complex technical challenges that all BMD systems must overcome. For example, THAAD went zero for six during the 1990s before achieving two hits. Then, after a five-year hiatus and redesign, the system achieved an eight-for-eight record. Likewise, the GMD system had eight successful intercepts in fifteen attempts. However, the two tests in January and December 2010 were failures; this performance was behind the MDA decision to restructure the GMD test program.

A "FOUNDATION OF GREATER COOPERATION"

Aegis BMD functions as an integral node in the overall, integrated national BMDS but also can operate independently to defeat ballistic missiles. Furthermore, Aegis BMD maintains this capability while also being able to carry out other naval warfare missions. This versatility makes Aegis BMD valuable as a component of an international effort to provide collective defense against ballistic missiles. The threat of WMD-armed ballistic missiles is no longer a U.S.-centric issue. During the past decade nations in Europe and Asia have increasingly looked for means to counter the emerging threat to their territories and forces. This presents new possibilities for the combined, coordinated, Aegis BMD enterprise.

The potential for a global BMD effort was highlighted in a 2009 report by the Independent Working Group on Missile Defense. It recommended limiting fixed, ground missile-defense deployments based on GMD in favor of expanding theater/regional defenses centered on sea-based missile defenses (along with Aegis Ashore, land-based SM-3 missiles, and THAAD system radars). The report recommended, "Equip additional U.S. vessels with the Aegis anti-missile system. Encourage U.S. allies equipped with Aegis/SM to do the same."²⁰

The Foundation: Aegis Abroad

The diffusion of Aegis BMD capability abroad is occurring quietly. Governments that have made naval force-structure investment decisions based primarily on inwardly focused national interests have discovered that their investments also enable them to combine their resources in collective defense. As the 2010 *Ballistic Missile Defense Review* acknowledged,

Other allies already own or are working with the United States to acquire specific capabilities, such as naval vessels equipped with the Aegis defensive system that could be adapted to include a missile defense capability. . . . A primary U.S. emphasis is on ensuring appropriate burden sharing. The Administration recognizes that allies do not view the specifics of the missile threat in the same way, and do not have equal resources to apply to this problem, but there is general recognition of a growing threat and the need to take steps now to address both existing threats and emerging ones.²¹

This effort to create a broad BMD enterprise builds on the current participation of allied navies in the Aegis program. This global effort started with a foreign military sales relationship with Japan, subsequently expanded to relationships with Australia and Korea, and now includes a commercial connection with Spain as well as an enterprise between Norway and Spain.²² Several other states have expressed interest in acquiring the Aegis weapon system and Aegis BMD. Importantly, Australia and other countries that are acquiring the Aegis system are stipulating that the systems they buy must have the capability of adding BMD in the future.

The Japan Maritime Self-Defense Force (JMSDF) was the first foreign navy to construct Aegis warships. The JMSDF as of late 2011 operated four *Kongo*-class destroyers; the lead ship of the class was commissioned in 1993. In 2000, the JMSDF won approval for two improved units, known as the *Atago* class; the lead ship of that class was commissioned in 2007.

Sharing, in light of an increasing regional threat, the U.S. interest in building ballistic-missile defenses, Japan decided in 2003 to upgrade its *Kongo* class with an Aegis BMD capability. U.S. foreign military sales upgraded all four ships accordingly, with SM-3 Block IA missiles. Japan subsequently decided to upgrade its *Atago*-class ships with Aegis BMD as well. That upgrade allows the JMSDF to meet the tenets of its New Defense Program Guidelines, which call for a total of six Aegis BMD-equipped ships to defend the country from missile threats, in conjunction with U.S. Navy warships.²³

U.S.-Japanese cooperation extends also to the SM-3 missile. The United States and Japan signed a memorandum of agreement in 1999 to cooperate in the development of the SM-3 Block IIA, with Japan contributing both funding and know-how. The Japanese technical contribution includes risk reduction in the areas of the kinetic kill vehicle, second-stage propulsion, and the nose cone. The success of the program led the U.S. Department of Defense to initiate talks aimed at urging Japan to relax its decades-long arms embargo and export the SM-3 Block IIA to other countries, including U.S. European allies. In 2011, the Japanese government gave its assent to export the SM-3 Block IIA.²⁴ This U.S./Japanese cooperation on Aegis BMD writ large and SM-3 Block IIA development specifically, as well as trilaterally among Japan, South Korea, and the United States, is increasingly evident in high-level Japanese publications, such as the 2011 *Defense of Japan* white paper, as well as in various conference and symposia reports where Japanese defense policy is discussed.²⁵

Across the Sea of Japan, South Korea has announced plans to build six 5,600-ton KDX-III Aegis-equipped destroyers beginning in 2019 to complement the three *Sejon-Daewan* KDX-III Aegis destroyers that was in service by 2012. Moreover, in 2011 South Korea declared that it was establishing a defensive system to

combat air-breathing (that is, generally, cruise missile, either ramjet or turbojet powered) and ballistic-missile threats from North Korea. Scheduled to be in place by 2015, the Korea Air and Missile Defense system will be built around the capabilities inherent in its Aegis-equipped destroyers and its modified PAC-3 ground-based interceptors.

The Aegis weapon system is becoming an anti-air/BMD weapon of choice for other navies also. The Spanish navy in early 2012 operated four Aegis-equipped air-defense frigates of the *Alvaro de Bazan* (F100) class, with another under construction. Spain's interest in Aegis and its shipbuilding expertise have been "exported" to the Norwegian and Australian navies. In 2011, the Royal Norwegian Navy received the last of five frigates of the *Fridtjof Nansen* (F310) class—a somewhat austere but still capable version of the F100—built by Navantia shipyard in Ferrol, Spain. The Australian government likewise is partnering with Navantia to build three air-defense destroyers of the *Hobart* class at the ASC Shipbuilding facility in South Australia.

Following in the path established by the U.S. Navy, non-U.S. Aegis operators have been taking steps to exploit the system's BMD capabilities. The JMSDF has progressed farthest in this regard, closely integrating its activities with its American counterparts. The destroyer *Kirishima* was the first foreign warship to participate in a U.S. Aegis BMD flight test, in June 2006. Eighteen months later, during the JMSDF's first flight-test mission, *Kongo* became the first ship of an allied navy to engage successfully a ballistic-missile target. Between 2007 and 2010, four separate JMSDF ships launched SM-3 missiles at medium-range, separating-warhead targets.²⁶ Spain too has evaluated the possibilities presented by Aegis BMD. The Spanish navy's *Mendez Nunez* (F104), outfitted with BMD software, tracked a ballistic-missile target during a 2007 flight test.

The network framework of the Aegis enterprise enables other European navies, those that do not operate Aegis warships, to join a broader, Aegis-centered naval BMD architecture. The Netherlands navy's *Tromp*, a frigate fitted with a modified SMART-L surveillance radar and the Advanced Phased Array Radar (APAR), demonstrated this potential when it tracked a ballistic-missile target during a December 2006 Aegis BMD flight test. The German navy also operates three frigates fitted with SMART-L, APAR, and the Mark 41 VLS. Denmark is planning to build similarly equipped patrol frigates, suggesting another avenue by which BMD capability can migrate across NATO navies.

Aegis Ashore

The diffusion of Aegis capabilities globally was accelerated when the Barack Obama administration announced a new U.S. ballistic-missile defense policy in September 2009.²⁷ President Obama's decision upended the George W. Bush administration's plan to place missile-defense radar sites and ground-based

interceptors in Eastern Europe, opting instead for a “Phased Adaptive Approach” (PAA)—a global sea- and land-based missile-defense capability centered initially on the Navy’s Aegis BMD system and the SM-3.²⁸ The decision to make this major shift in U.S. ballistic-missile policy—deferring the planned fixed-site ground-based system in Europe in favor of Aegis BMD afloat and ashore—was a direct response to the threat of short-to-intermediate-range Iranian ballistic missiles carrying WMD, slower than anticipated development of Iranian ICBMs, and a desire to engage Russia—which was vehemently opposed to GMD deployment in Eastern Europe—in BMD plans.²⁹

At the November 2010 NATO Lisbon Summit, President Obama highlighted the importance of the Phased Adaptive Approach as well as the potential of Aegis BMD to undergird global partnerships:

We must strengthen the full range of capabilities that are needed to protect our people and prepare for the missions of tomorrow. . . . Another necessary alliance capability is missile defense of NATO territory, which is needed to address the real and growing threat from ballistic missiles. The Phased Adaptive Approach to European missile defense that I announced last year will provide a strong and effective defense of the territory and people of Europe and our deployed American forces. Moreover, it forms the foundation of greater collaboration—with a role for all allies, protection for all allies, and an opportunity to cooperate with Russia, which is also threatened by ballistic missiles.³⁰

The PAA comprises four phases. In Phase 1 (2011), existing sea-based Aegis missile-defense ships and radars have been deployed to defend against short- and medium-range ballistic missiles potentially threatening southern Europe. On 7 March 2011, USS *Monterey* (CG 61) left its home port of Norfolk, Virginia, for a six-month deployment to the Mediterranean as the first Aegis BMD ship to deploy specifically in support of the EPAA.³¹ This historic deployment was widely reported in the national and international media.

In PAA phases 2 (2015), 3 (2018), and 4 (2020), the Aegis SM-3 missiles will be successively upgraded to provide coverage against medium- and intermediate-range missiles. By Phase 4, the Block IIB variant of the SM-3 should have an intercept capability against ICBMs as well.³²

Momentum had been growing in Europe to build an alliance-wide missile-defense system compatible with Aegis BMD; Anders Fogh Rasmussen, NATO’s secretary general, declared, “Missile defense presents the greatest potential for enhancing our cooperation.”³³ The issue of collective ballistic-missile defense was a major theme during the Lisbon summit, which approved a plan for Aegis-enabled European BMD as a core element in NATO’s new strategic concept: “NATO will actively seek cooperation on missile defense with Russia and other Euro-Atlantic partners.”³⁴

NATO's Supreme Allied Commander, Admiral James Stavridis, USN, noted that a plan to link the American PAA with a NATO missile-defense shield to provide a European theater-wide BMD shield is under development by U.S. European Command.³⁵ Well before the summit, NATO's Active Layered Theatre Ballistic Missile Defence program had conducted tests with the U.S. C2BMC system, with the ultimate, long-sought goal of international command-and-control interoperability. All twenty-eight NATO allies were already engaged in discussions as to how to connect the European members' short- and medium-range theater missile-defense systems via NATO to the U.S. long-range missile-defense system.

AN AEGIS BMD FOCUS FOR THE GLOBAL MARITIME PARTNERSHIP

By early 2012, Aegis was deployed on eighty-eight ships, with another eighteen under construction or planned. The vast majority of these belong to the U.S. Navy, but the number of non-U.S. Aegis platforms is growing as well. Additionally, more nations are buying or considering BMD capabilities for their Aegis-equipped ships.

The value of encouraging the increased adoption of Aegis-like capabilities—as well as interoperability with existing Aegis platforms afloat and ashore—is clear. Even the current, somewhat circumscribed, distribution of Aegis assets constitutes a foundation for a potential “sensor/shooter” mix for a global ballistic-missile defense enterprise. The shooter component can be shared, as well as the partners' agreed-on rules of engagement. For example, if the United States and Japan agree to form a defensive sensor shield over Japan and U.S. forces surrounding Japan against a North Korean missile launch, this shield can be accompanied by a missile-defense strike capability against the North's launch sites. The urgent need to deepen Japanese collaboration with the United States for missile defense in response to North Korea's testing of nuclear weapons has been recognized by both governments.³⁶ As South Korea proceeds along its current path, it too could well join the Aegis Afloat BMD partnership.

At the end of the day, sovereign interdependence and interoperability will remain core attributes of any Aegis global enterprise. The Aegis BMD system is already integrated and interoperable with other U.S. assets, and it will eventually be brought to the same standard with regard to coalition operations as well. Adoption of Aegis-type capabilities by allied militaries does not have to mean the exact replication of U.S. equipment and architecture, as demonstrated by South Korea's concentration on a national, vice regional, missile-defense plan. At the technical level, however, reliance of non-U.S. assets on American hardware and software in systems like Aegis goes a long way toward syncing allied capabilities and interoperability.

In Europe, the decision as to whether and how to connect the European NATO allies' short- and medium-range theater missile-defense systems to the U.S. long-range missile defense system will be critical to the coherence of alliance-wide BMD. A high level of commitment to international partnership on the parts of both the United States and its allies—already evinced by ALTBMD and C2BMC shared situational-awareness tests—will encourage interoperability initiatives. This interoperability will, in turn, help ensure the success of the U.S. Phased Adaptive Approach.

Ultimately, commitment to international partnership by the United States and its allies and friends to make Aegis BMD afloat a bulwark of global missile defense will do much to prepare all concerned for combating the growing threat of ballistic missiles of all colors and hues. It also offers the strong potential—more than anything else has in the years since Admiral Mullen's 2005 speech—to gird the Global Maritime Partnership for “high end” warfare. But this will not happen without leadership and stewardship at the highest level.

TOWARD EXTRAORDINARY REWARDS

Close cooperation in the area of Aegis BMD between the United States and Japan, possibly Korea, and potentially Australia does not in itself qualify as an “Aegis BMD Global Enterprise.” But to include European nations in an Aegis-afloat enterprise of capabilities approaching those planned for the ALTBMD/EPAA system would. But why would European nations, with defense budgets dwarfed by that of the United States, embark on such an enterprise? The reason is clear: NATO and the European governments have interests often well beyond the territorial boundaries of the European continent.

European navies are now deployed worldwide fulfilling the vision of a Global Maritime Partnership: supporting operations in Iraq and Afghanistan, fighting in Libya, conducting antipiracy patrols in the Horn of Africa and elsewhere, and supporting humanitarian assistance operations around the world. There could be no more propitious time to begin to link more completely European allies in an Aegis BMD Global Enterprise, in much the same way the U.S. Navy is now linked to its Asia-Pacific partners in a high-end Aegis BMD Global Maritime Partnership. Such an enterprise would enable these nations—with U.S. participation—to deal with such compelling threats as China's DF-21D “ship killer” ballistic missile, especially if this missile is exported to China's friends. This creates an ideal opportunity to create a “high end” Global Maritime Partnership supported by Aegis BMD.

But it is unlikely that such a venture would succeed without ongoing U.S. leadership, the same sort of leadership that is supporting sea-based Aegis BMD for

territorial and fleet ballistic-missile defense today in the northeast Pacific as well as sea-based and land-based ballistic territorial missile defense in Europe. Clearly, U.S. leadership could be what accelerates the morphing of a now-nascent Aegis BMD Global Enterprise in Europe into a global Aegis BMD afloat capability.

“Leadership” often means “funding.” In the face of the most draconian U.S. Defense Department budget cuts in a generation, plans for enhanced MDA or Navy funding to add to the Aegis BMD capabilities of partner nations will receive intense scrutiny. But given the manifest benefits to the nation and to a 280-ship U.S. Navy of supporting and sustaining a higher-end global maritime partnership than exists today, even a modest investment could well reap extraordinary rewards.

The U.S. Navy already does this in the area of command, control, communications, computers, and intelligence, providing the Combined Enterprise Regional Information Exchange System (CENTRIXS) to allied and coalition partners to facilitate their participation in various operations and exercises.³⁷ The United States could spearhead international Aegis BMD weapons burden sharing—creating a pool of SM-3 missiles for use by NATO navies when they deploy together out of theater.

There is a growing worldwide commitment to Aegis ballistic-missile defense, a commitment with broad potential to field an international global enterprise capable of defending against the most imminent, and growing, threat to nations and navies, on land and at sea alike—the threat of ballistic missiles, particularly those armed with weapons of mass destruction. The Aegis Global Enterprise is the key to girding the Global Maritime Partnership for the reality of “high-end warfare.”

NOTES

1. “SECDEF Announces Stationing of Aegis Ships at Rota, Spain,” Navy.mil, 5 October 2011.
2. Clarence Robinson, “A Sea Change in Ballistic Missile Defense,” in *The Year in Defense: Spring 2010 Naval Edition* (Tampa, Fla.: Faircount Media, 2010). Robinson quotes Rear Adm. Frank Pandolfe, then director of the Navy’s Surface Warfare Division (N86): “Over time we will have a much larger and more capable BMD force, with all 62 destroyers already built or under construction as BMD-capable units” (p. 37). For the planned numbers of Aegis BMD ships see “Navy Aims for 94 BMD-Capable Ships by 2024, Lays Out Plans to Congress,” *Inside the Navy*, 20 June 2011, p. 1.
3. Ronald O’Rourke, *Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress*, RL 33745 (Washington, D.C.: Congressional Research Service, 19 April 2011). O’Rourke notes, “Some observers are concerned—particularly in light of the EPAA—that demands from U.S. regional military commanders for BMD-capable Aegis ships are growing faster than the number of BMD-capable Aegis ships. They are also concerned that demands from U.S. regional military commanders for Aegis ships for

- conducting BMD operations could strain the Navy's ability to provide regional military commanders with Aegis ships for performing non-BMD missions" (summary).
4. J. T. Conway, G. Roughead, and T. W. Allen, "A Cooperative Strategy for 21st Century Seapower," October 2007, available at www.navy.mil/; repr. *Naval War College Review* 61, no. 1 (Winter 2008), p. 15.
 5. Adm. Gary Roughead, Chief of Naval Operations, remarks (Engineering the Total Ship Symposium, Falls Church, Va., 26 September 2008). Admiral Roughead noted specifically, "In 1972 there were nine countries, states that possessed ballistic missiles. In 1990 there were 16 and in 2006 there were 25. So that's a nation every three years that's acquiring ballistic missile capability."
 6. Mark Thompson, "The Pentagon Prepares for a Missile Attack from Iran," *Time.com*, 17 December 2009, provides one of the earliest open-press reports detailing the threat from short- and midrange Iranian missiles.
 7. Leon Panetta, interview by Jake Tapper, *This Week*, ABC, 27 June 2010, abcnews.go.com/.
 8. James Woolsey and Rebekah Heinrichs, "Iran and the Missile Defense Imperative," *Wall Street Journal*, 14 July 2010.
 9. International Atomic Energy Agency, *Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions in the Islamic Republic of Iran*, GOV/2011/63 (Vienna: 8 November 2011). See also "Iran's Nuclear Program," *New York Times*, 12 November 2011.
 10. Peter Foster, "North Korea 'May Have Developed Nuclear Warhead for Ballistic Missile,'" *Telegraph*, 13 June 2011, www.telegraph.co.uk/; Elisabeth Bumiller and David E. Sanger, "Gates Warns of North Korea Missile Threat to U.S.," *New York Times*, 11 January 2011.
 11. U.S. Senate, *Statement of Rear Adm. Archer Macy before the Senate Armed Services Committee, Subcommittee on Strategic Forces*, 112th Cong., 1st sess., 13 April 2010, p. 8, available at www.dod.gov/.
 12. Marshall Hoyler, "China's 'Antiaccess' Ballistic Missiles and U.S. Active Defense," *Naval War College Review* 63, no. 4 (Autumn 2010), p. 84. Hoyler notes the crucial role of Aegis BMD in addressing the threat of Chinese ASBMs.
 13. "Adm. Willard: Chinese Anti-ship Missile Close to Operational," *InsideDefense.com*, 27 August 2010, quoting Patrick Cronin.
 14. "China's Missiles," *Economist Online*, 6 December 2010, www.economist.com/.
 15. "China's Naval Ambitions," editorial, *New York Times*, 2 January 2011.
 16. Matthew Harper, "Chinese Missiles and the Walmart Factor," U.S. Naval Institute *Proceedings* (July 2011), pp. 16–21.
 17. In addition to his published body of work regarding China's growing antiaccess and area-denial capabilities, Andrew Erickson has focused intensively on this antiaccess/area-denial (A2/AD) threat in interviews. See, for example, his interview in "China's 'Ripples of Capability,'" *AOL Defense*, 30 August 2011, defense.aol.com/. In it he notes, "U.S. Carrier Strike Groups and other platforms are increasingly threatened by A2/AD weapons like Anti-Ship Ballistic Missiles and streaming cruise missiles." See also Tony Capaccio, "China Has 'Workable' Anti-ship Missile Design," *Pentagon Says*, *Bloomberg.com*, 25 August 2011. This article, just one of many detailing the capabilities of the DF-21D, cites a Pentagon report issued *after* the Defense Department's Annual Assessment of China's Military Power, noting that "China has developed a 'workable design' of the world's first anti-ship ballistic missile" and that "Chinese advances in military technology are drawing administration and congressional scrutiny. The Pentagon is concerned that China may threaten U.S. naval forces in the Pacific region."
 18. "Missile Defense Agency Asks Congress for \$1 Billion for BMDS Testing," *Inside the Pentagon*, 11 February 2010, p. 5.
 19. U.S. Defense Dept., *Aegis Ballistic Missile Defense FTM-16 Fact Sheet* (Washington, D.C.: Missile Defense Agency, 22 August 2011), www.stratcom.mil/.
 20. Independent Working Group, *Missile Defense, the Space Relationship & the Twenty-First Century* (Washington, D.C.: Institute for Foreign Policy Analysis, 2009), p. xiii. For a description of how the overall cuts in national BMDS proposed *increasing* funding for the sea-based SM-3 program, see Baker Spring, "Gates' Proposed Missile Defense Cuts: Confusion and Contradictions," *Heritage*

- Foundation*, 13 April 2009, pp. 1–3, available at s3.amazonaws.com/.
21. U.S. Defense Dept., *Ballistic Missile Defense Review Report* (Washington, D.C.: February 2010), p. 32, available at www.defense.gov/. The success of Aegis BMD afloat and the promise of Aegis Ashore have also garnered interest from a wide range of nontraditional partners, such as India. See Amy Kazmin and Farhan Bokhari, “New Delhi Weighs Up US Missile Shield,” *Financial Times*, 8 January 2009, available at www.militaryphotos.net/.
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 23. Government of Japan, *Summary of National Defense Program Guidelines for FY 2011 and Beyond (Provisional Translation)* (Tokyo: 17 December 2010), p. 7, www.kantei.go.jp/foreign/kakugikettei/2010/summary_ndpg_e.pdf.
 24. “Govt Sets Terms for Missile Interceptor Transfer,” *Yomiuri Shimbun*, 29 July 2011, www.yomiuri.co.jp/.
 25. For two of the increasingly forward-leaning statements regarding this cooperation, see Government of Japan, *Defense of Japan 2011 (Provisional Translation)* (Tokyo: Ministry of Defense, 14 October 2011), www.mod.go.jp/e/publ/w_paper/2011.html; and Pacific Forum Young Leaders, *U.S. Japan Joint Vision Statement*, PacNet 43 (Honolulu: Pacific Forum CSIS, 17 August 2011), available at csis.org/.
 26. U.S. Defense Dept., *Aegis Ballistic Missile Defense Program Review 2011*, p. 25.
 27. U.S. White House, *Fact Sheet on U.S. Missile Defense Policy: A Phased Adaptive Approach for Missile Defense in Europe*, press release 17 September 2009, p. 1. See also O’Rourke, *Navy Aegis Ballistic Missile Defense (BMD) Program*, pp. 5–8, for a detailed description of the administration’s Phased Adaptive Approach for BMD.
 28. U.S. Defense Dept., *Ballistic Missile Defense Review Report*. The Phased Adaptive Approach, initially implemented in Europe, will eventually be adopted within other regions, particularly the Middle East and East Asia.
 29. “Aegis BMD Assets to Play Greater Role in European Missile Defense,” *Inside the Navy*, 21 September 2009, p. 3. This article quotes Phillip Coyle, the Pentagon’s top weapons tester during the William Clinton administration, who describes the rationale behind the president’s decision: “The Obama administration is recognizing that Iran does not currently possess any intercontinental ballistic missiles (ICBM) that could reach the United States, so it may be more prudent to address the short-term threat to southern Europe, where the short- and medium-range missiles that Iran does possess can reach. Aegis BMD ships would be ideally suited for that job.”
 30. Barack Obama, “Europe and America, Aligned for the Future,” *International Herald Tribune*, 19 November 2010, p. 8.
 31. O’Rourke, *Navy Aegis Ballistic Missile Defense (BMD) Program*, p. 7.
 32. U.S. Defense Dept., *Aegis Ballistic Missile Defense Program Review 2011*, p. 5.
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 34. “EUCOM Missile Defense Plan ‘Ready to Present’ by Spring 2011,” *Inside the Navy*, 13 December 2010, p. 3.
 35. *Ibid.*
 36. Martin Fackler, “Japan Announces Defense Policy to Counter China,” *New York Times*, 17 December 2010, p. A10; “Report: Reform U.S.-Japan Alliance in Wake of China’s Threat,” *Inside the Navy*, 1 November 2010, p. 3.
 37. For discussion of CENTRIXS as a vehicle for linking together coalition ships engaged in Global Maritime Partnership activities, see Brad Carter and Deb Harlor, “Combined Operations Wide Area Network (COWAN)/ Combined Enterprise Regional Information Exchange System (CENTRIXS),” in *SSC San Diego Biennial Review 2003* (San Diego, Calif.: Space and Naval Warfare Systems Center, 2003); Alberto A. Soto, “Maritime Information-Sharing Strategy: A Realistic Approach for the American Continent and the Caribbean,” *Naval War College Review* 63, no. 3 (Summer 2010), p. 145; and Frank Bantell, José Carreño, and Russell Grall, “Professional Notes: Strong Partnerships Need Secure Communications,” *U.S. Naval Institute Proceedings* (July 2011), pp. 80–81.