

## Ballistic Missile Defense Review Report

The Ballistic Missile Defense Review (BMDR) Report is a 48-page document that establishes new strategic and military directions for the coming phases of U.S. missile defense efforts over the next decade and beyond. Not intended to defend against the large Russian intercontinental ballistic missile (ICBM) force, the missile defense is principally focused on providing protection against nuclear attacks launched by North Korea, Iran, and other regional adversaries. It does so mainly by scaling back, but not eliminating, the Ground-based Midcourse Defense (GMD) system inherited from the Bush administration, canceling the so-called GMD Site Three in Poland, and accelerating plans to deploy increasingly sophisticated Standard Missile-3 (SM-3) interceptors, sensors, and command, control, communications, and intelligence (C<sup>3</sup>I) systems. Whereas the GMD system was focused primarily on providing homeland defense of the United States, the SM-3 program is mainly intended to provide missile defense protection of key regions, including Europe, Asia, and the Middle East. As Secretary Robert Gates states in his memorandum introducing the BMDR Report, defense against near-term regional threats is now a top priority of U.S. missile defense plans, programs, and capabilities.

The historical context is important to understanding the BMDR Report's contents. At the height of the Cold War during the 1960s, the Department of Defense (DOD) was pursuing vigorous research, development, test, and evaluation (RDT&E) programs for shooting down Soviet ICBMs and warheads with interceptor missiles. Careful study of the offense-defense interaction, however, showed that the United States could not be protected against massive damage in a nuclear war, that an ineffective and costly missile defense system could not be risked, and that such a system

would accelerate the nuclear arms race. The result of subsequent U.S.-Soviet negotiations was an arms control treaty of the 1970s that ruled out large missile defenses on both sides, in the hope of fostering greater stability in the arms race. As a result, the United States was left wholly unprotected against missile attack.

When the Reagan administration took power in 1981, it questioned the wisdom of having no missile defenses and therefore launched a major RDT&E effort—called the Strategic Defense Initiative—to investigate the prospects for employing new technologies and systems that could work effectively. Despite large expenditures in multiple areas, no missile defenses were deployed during the 1980s and 1990s. But RDT&E efforts began focusing on the idea of creating a small missile defense posture that could protect the United States against limited ICBM threats posed by such regional adversaries as North Korea. Maturation of this idea and its technologies led the Bush administration in 2002 to authorize deployment of the GMD system, which was composed of 44 missiles at two sites in the United States (Alaska and California), and 10 missiles at the third site in Poland. Focused mainly on protecting the U.S. homeland, the GMD system did not provide significant missile defenses for protecting overseas-deployed U.S. military forces or key regional allies against threats to them.

The BMDR Report argues that missile threats from such adversaries as North Korea and Iran are growing in quantity and quality. Over the coming decade, it states, such adversaries can be expected to develop short-range ballistic missiles (SRBMs), medium-range ballistic missiles (MRBMs), and intermediate-range ballistic missiles (IRBMs) that can strike targets in nearby regions, and perhaps ICBMs capable of striking the United States. For both countries, such missiles are already being tested, and their future deployment in menacing numbers seems likely. In addition, North Korea already has nuclear weapons, while Iran may be developing them. The worrisome risk is that for North Korea and Iran, and perhaps for others over the long haul, nuclear weapons could be mounted atop long-range ballistic missiles, thereby rendering them capable of inflicting immense damage on

neighboring states and even the United States. Beyond this, the BMDR Report argues, nuclear-tipped missiles could enable North Korea, Iran, and others to pursue peacetime coercion of neighbors that include many allies and partners of the United States. Defending against these threats, it judges, is imperative.

Credible hope, the BMDR Report asserts, comes from the rapid progress that U.S. RDT&E programs for missile defense have been making recently in the form of better interceptors, radars and sensors, and C<sup>3</sup>I systems. The principal challenge, it states, is to take advantage of this progress by forging a revised missile defense strategy anchored in new programs. Together these provide deterrence of attack on the U.S. homeland, extended deterrence of attacks on allies and partners, and reassurance of those allies and partners. In this new strategy, deterrence is achieved not mainly by threatening nuclear retaliation, but by possessing interceptors capable of shooting down enemy nuclear missiles during the midcourse phase of their trajectory, thereby denying the adversary confidence that a nuclear attack, or the threat of such an attack, could achieve its strategic goals.

Accordingly, the BMDR Report puts forth six policy priorities for guiding ballistic missile defense efforts:

- The United States will continue to defend the homeland from limited ballistic missile attack.
- The United States will defend deployed U.S. forces from regional missile threats while also protecting allies and partners and enabling them to defend themselves.
- New missile defense capabilities must undergo realistic operational testing that demonstrates their effectiveness before they are deployed—a “fly before buy” approach will be followed.
- The commitment to new BMD capabilities must be fiscally sustainable over the long term—affordability will be important in the strategic calculus.
- U.S. BMD capabilities must be adaptable and flexible to adjust to changing future threats.

- The United States will seek to lead expanded international efforts for missile defense.

*Defending the Homeland.* The BMDR Report judges that currently the United States is adequately defended against limited ICBM attacks by the already deployed GMD posture of 30 Ground-based Interceptors (GBI, 26 in Alaska and 4 in California), early warning radars at four sites at home and abroad (Greenland and the United Kingdom), afloat radar systems, and a sophisticated command and control infrastructure. Accordingly, it states, DOD will scale back the original continental United States missile deployment plan from 44 GBI to the 30 GBI already deployed, and cancel or restructure some RDT&E programs (for example, the Airborne Laser Program) that have not succeeded. To preserve an adequate capability for the future and hedge against uncertainty, it states, DOD will pursue a vigorous RDT&E effort in GMD system enhancements that include more GBI testing, the SM-3 Block IIB missile, new missiles for intercepting long-range missiles early in flight, improved capacity to defeat countermeasures and achieve kinetic kills, and improved sensor networks that include airborne and space-based sensors. In addition, it states, DOD will complete construction of the final 14 GBI silos, which will provide a reserve capacity to rapidly deploy 8 more GBI missiles from the test pool.

*Defending Against Regional Threats.* In pursuing regional defense, the BMDR Report states, the United States has made considerable progress at developing and fielding essential capabilities for protecting against SRBMs and MRBMs. These assets, it continues, include increasingly capable Patriot batteries for point defense against SRBMs, the powerful AN/TPY-2 X-band radar for detecting and tracking ballistic missiles, soon-to-be-deployed Terminal High Altitude Area Defense (THAAD) batteries for intercepting SRBMs and MRBMs, and the sea-based SM-3 Block 1A interceptor aboard Aegis-equipped ships. Judging, however, that current capabilities are modest against emerging missile threats, it provides added funds for procuring more THAAD and SM-3 Block 1A interceptors, upgrading more Navy

ships to incorporate Aegis BMD capabilities, and acquiring more AN/TPY radars. In addition, it puts forth an expanded program for the near term by developing a land-based SM-3 system, called “Aegis Ashore,” that can be moved from one site to another. Aegis Ashore is to be ready by 2015. The report notes that DOD expects to have available a more capable SM-3 interceptor, the Block 1B, by 2015. The Block 1B, it states, will have an improved seeker capability for better target discrimination and greater area coverage. Additional near-term measures will include the continued development of an improved C<sup>3</sup>I and battle-management system, improved sensors and situational awareness, an airborne infrared sensor, and an exploratory effort to develop improved early intercept capabilities by shortening the time needed to identify and track incoming missiles.

Turning to long-term measures, the BMDR Report states that toward the end of the decade, the new SM-3 Block IIA will have a higher burnout velocity and a more advanced seeker that will make it much more capable than the SM-3 Block IA and IB and provide greater regional coverage. It further reports that a SM-3 Block IIB missile is in the initial phase of technology assessment and development. This missile, it states, will provide added improvements in burnout velocity, divert capability, and regional coverage, and will provide some early intercept capability against long-range missiles. Investments, it states, are also being made to develop a better capacity to uplink data from multiple sensors as well as persistent overhead sensors in space that could detect and track launching of multiple missiles in ways that would reduce the need for terrestrial sensors and the size of deployed missile defenses. Funding this Precision Tracking and Space System, it states, is an important priority for the current DOD budget and Future Years Defense Plan.

*Pursuing Integrated Regional Postures.* Arguing that while past approaches to building regional missile defenses have proceeded from the bottom up, the BMDR Report asserts that future policies must be based on “top-down” thinking in strategic terms. It states that planning must begin with overarching, integrated core concepts that take U.S. and allied roles into account and then

address the details of programs to create the appropriate set of missile interceptors, C<sup>3</sup> systems, sensors, and other assets. Accordingly, the BMDR Report puts forth three principles to guide development of regional approaches to achieve deterrence and pursue such other security goals as enhanced alliance cohesion, effective use of scarce resources, and focus on real threats and proven solutions. These goals are:

- Regional missile defense must be built on a strong foundation of improved security, cooperative relationships, and appropriate burden-sharing between the United States and its allies and partners in ways that, along with enhanced conventional capabilities, reduce reliance upon nuclear weapons for deterrence.
- The United States will pursue a phased adaptive approach (PAA) tailored to the individual requirements and opportunities of each region in ways that do not require a global structure that integrates all allies into a uniform architecture.
- The United States will develop flexible and mobile missile defenses that can be relocated among theaters and scaled upward or downward because the demand for missile defenses within each region over the next decade will exceed supply.

The BMDR Report focuses especially on the agenda of applying the PAA to Europe. It states that the earlier plan to deploy a GMD defense site in Poland along with radars in the Czech Republic was cancelled not because it failed to make sense some years ago, but because the emerging SM-3 missile and associated assets provide a more effective approach to defense against missile threats from the south. For Europe, the BMDR Report puts forth a four-phase plan:

- In Phase 1 (2011 timeframe), existing missile defenses will be deployed to defend against SRBM and MRBM threats. By using Aegis ships, SM-3 Block IA interceptors, radars, and associated assets, the resulting missile posture will aspire to protect vulnerable portions of southern Europe.

- In Phase 2 (2015 timeframe), missile defenses will be enhanced by deploying SM–3 Block IB missiles, additional sensors, better C<sup>3</sup> systems, and a land-based SM–3 site to expand coverage to additional North Atlantic Treaty Organization (NATO) Allies.
- In Phase 3 (2018 timeframe), coverage against MRBMs and IRBMs will be improved with a second land-based SM–3 site located in northern Europe as well as deployment of the SM–3 Block IIA missile, thereby extending coverage to all NATO Allies in Europe.
- In Phase 4 (2020 timeframe), additional capability will come from deployment of the SM–3 Block II B, which will provide protection against ICBMs launched from the Middle East against the United States and Europe.

The BMDR Report’s discussion of future U.S. PAAs for Asia and the Middle East is less concrete. It notes that although the United States works through the NATO multilateral defense structure in Europe, it relies on bilateral alliances with key states in Asia and less formal relationships with a number of allies and partners in the Middle East. These dissimilar situations, it states, produce differing patterns of cooperation with the United States on ballistic missile defense, and have implications for the authorities under which the United States is able to operationally employ defenses to protect local allies and partners. In Asia, the BMDR Report states, the United States and Japan already cooperate in interoperable ways and are working together to develop a future missile defense system. In the Middle East, the United States and Israel are involved in production of the Arrow 2 missile and other RDT&E activities, and the United States is beginning to work with some Gulf Cooperation Council partners. Its main conclusion is that because the foundations for applying the PAA in these three regions are different, the pathways forward for U.S. missile defense deployments will be different, too—but it is vague on the exact pathways for Asia and the Middle East.

*Strengthening International Cooperation.* The BMDR Report asserts that the goal of expanding international efforts and cooperation on missile

defense is being pursued on a dual track: developing and fielding robust, pragmatic, and cost-effective capabilities; and engaging in international cooperation on a broad range of missile defense–related activities, such as technological and industrial cooperation with multiple countries including Russia. As part of this effort, the BMDR Report states, the United States is engaged in an interagency review of its export control system in order to provide improved ways to facilitate allied missile defense efforts while denying transfer of technology to adversaries.

In Europe, the BMDR Report states, the United States is committed to implementing the PAA within a NATO context. In late 2009, NATO foreign ministers welcomed the U.S. PAA and declared that it reinforces the Alliance’s central role in missile defense in Europe. In practical terms, this means that the European PAA will be the U.S. national contribution to a NATO missile defense capability. Accordingly, the BMDR Report states, the United States supports a potential NATO decision to adopt the role of missile defense of allied territory and population. Likewise, it continues, the United States supports NATO’s ongoing effort to build and strengthen its program for an integrated command and control system for missile defense, which is called Active Layered Theater Missile Defense (ALTMD). The BMDR Report declares that while the ALTMD is currently designed to link together Allied assets for protecting deployed forces, it could be expanded to coordinate missile defense efforts to protect Allied populations and territory. In this context, it states, Poland and the Czech Republic will play a role in the PAA, and the United States is working with multiple Allies to develop and deploy missile defenses such as naval vessels with Aegis capabilities that could be linked together to create a networked NATO defense system. A primary U.S. emphasis, it claims, is to produce effective Alliance missile defenses and appropriate burden-sharing.

In East Asia, the BMDR Report states, the United States has a range of cooperative relationships, with Japan being a principal BMD partner. Japan, it judges, has acquired a layered integrated missile defense system that includes Aegis ships with SM–3 missiles, Patriot PAC–3 missiles, early warning radars,

and a command and control system. The United States and Japan are pursuing regular training for cooperative missile defense, and are co-developing the SM-3 Block IIA interceptor. It lists South Korea as another important BMD partner that has indicated an interest in acquiring a missile defense capability that includes land-based and sea-based systems, as well as early warning radars and a command and control system. Bilateral discussions, it states, are also taking place with Australia and other countries in the region. In the Middle East, the BMDR Report portrays Israel as a leading BMD partner through common RDT&E programs such as the Arrow missile, plus training and exercises aimed at promoting operational cooperation. In the Persian Gulf, it states, the United States has a continuous missile defense presence and is seeking to build upon a Bilateral Air Defense Initiative to strengthen cooperation. A number of states, it continues, are exploring purchase of some missile defense capability under the Foreign Military Sales program.

The BMDR Report declares that the goal of renewing cooperation with Russia on missile defense is receiving special emphasis, but without negotiating constraints on future U.S. BMD capabilities. One purpose of political dialogue, it states, is to convince Russia's leaders that better U.S. regional missile defenses are needed for reasons of international security and do not pose a threat to Russia's nuclear deterrent posture. An attractive feature of the European PAA, it continues, is that it allows for a potential Russian contribution—for example, early warning radars—if politically feasible.

The United States, it states, is pursuing a close dialogue with Russia on such issues as a joint assessment of ballistic missile threats and a new approach to strategic stability that integrates offensive and defensive capabilities in the hope of producing deeper nuclear reductions by both countries. In addition, the BMDR Report states, the United States is pursuing diplomatic engagement aimed at convincing China that its nuclear deterrent posture is not threatened by U.S. missile defense efforts. But it further states that China must understand that the United States will work to defend its Asian allies and partners from all regional ballistic missile threats. The future, it judges, requires a substantive and sustained dialogue with China

focused on enhancing confidence, improving transparency, and reducing mistrust on strategic security issues.

*Managing the Missile Defense Program.* In its final section, the BMDR Report addresses the new DOD approach to managing the missile defense enterprise so that effective capabilities are acquired, rigorous testing is accomplished, and programs are affordable. In earlier years, the Missile Defense Agency (MDA) was assigned main responsibility for handling the effort in absence of strong guidance from elsewhere in DOD. During 2007–2008, this practice was altered. DOD created a Missile Defense Executive Board (MDEB) to bring together top DOD senior executives as well as Department of State and National Security Council officials to provide guidance on missile defense. Office of the Secretary of Defense staffs, military departments, Joint Staff, and combatant commands were provided authority to influence preparation of the MDA annual program plan and budget submission. In addition, a Ballistic Missile Defense System (BMDS) Life Cycle Management Process was created to provide continuing overview of missile defense programs as they transition from MDA to implementation by the military departments. In the context of this strengthened approach to missile defense management by DOD, the BMDR Report addresses four specific questions:

- What more can or should be done now to strengthen the testing program?
- Can missile defense be made more cost-effective?
- Is internal DOD oversight of the program adequate?
- Is external transparency adequate?

In addressing the testing program, the BMDR Report states that the 2002 approach, which called for simultaneous development and deployment of GBI missiles, was a high-risk acquisition strategy intended to quickly field missile defenses before testing was complete. The new approach, it states, reflects a commitment to fielding proven technologies and missiles. Thus, it urgently requires new testing practices aimed at validating capabilities before they are procured and deployed. Accordingly, it states, MDA is now

producing an Integrated Master Test Plan in concert with the Office of the Director, Operational Test & Evaluation, that addresses the testing of each system through the entire development process, rather than looking only 2 years into the future. This plan, it states, outlines a combination of models, simulations, and actual flight tests that can be used to evaluate operational effectiveness and reliability before procurement decisions are made. The new approach to testing and evaluation, it argues, represents a major step forward and addresses concerns, including the need for better metrics for evaluating reliability and performance that arose with the prior test construct.

In addressing cost-effectiveness, the BMDR Report advances key metrics for performance: cost in comparison to other available options, affordability, and the relationship between incurred costs and costs avoided. The BMDR Report thereby implies that missile defense programs will be judged cost-effective if they meet desired performance standards, are less expensive than other options, are affordable within realistic budgets, and help offset costs in such other areas as nuclear forces. But if they fail to meet these criteria because their costs are too high in relation to their effectiveness, they face potential cancellation. Noting that the BMD effort is consuming 2 percent of the DOD budget, it states that the actual life-cycle cost of new missile defense programs is hard to gauge because at early stages, there is no final configuration for the system. As a result, development and procurement costs become variables that depend upon the number of missiles ultimately deployed and their desired performance characteristics. Because of high costs, it states, DOD will not be able to buy enough interceptors to match adversary short-range missiles on a one-for-one basis. This constraint, it judges, enhances the importance of fielding mobile systems that allow missiles to be concentrated quickly in order to address the most immediate threats.

In addition, the BMD Report announces decisions to cancel two troubled programs and to restructure a third:

- The Multiple Kill Vehicle (MKV) has been terminated. Originally intended to equip midcourse interceptors with a capacity to destroy all lethal objects in a threat cluster, the MKV program was terminated

because its technology was not maturing well enough and a continuing effort to strive for effective performance was deemed too costly and time-consuming.

- The Kinetic Energy Intercept (KEI) program has been terminated. Originally intended to intercept enemy missiles in the boost-phase of flight, the KEI program was neither affordable nor proven, and its cost had ballooned from \$4.6 billion to \$8.9 billion, with production costs growing from \$25 million per interceptor to \$50 million.
- The Airborne Laser (ABL) program was restructured because it had experienced repeated schedule delays and technical problems since inception in 1996, and its operating concept was not adequately defined. Plans for a second ABL aircraft were cancelled, and the first ABL aircraft was shifted to a technology demonstration program.

In addressing internal DOD oversight, the BMDR Report observes that in earlier years, MDA was exempted from DOD standard acquisition rules and the requirements generation process. The new management structure, it states, will correct this problem by bringing multiple actors into the decisionmaking process for missile defense. Stronger internal oversight, it continues, will be provided by the MDEB, by a warfighter-involvement process chaired by U.S. Strategic Command, and by the BMDS Life Cycle Management Process. As a result, the MDA budget now moves through a process that begins with top-level strategic direction, incorporates guidance from the military Services on requirements and desired capabilities, and is subject to final review by the MDEB and Deputy Secretary of Defense. The overall result, the BMDR Report judges, is an improved management process that draws upon MDA's still important strengths in systems engineering and allows other DOD agencies to exert leadership aimed at ensuring that missile defense programs are affordable and meet the needs of the Services and combatant commanders.

In addressing external transparency, the BMDR Report states that earlier MDA special responsibilities and exemption from internal DOD oversight created concerns about congressional oversight and the transpar-

ency of missile defense plans, programs, and commitments. To correct this problem, the BMDR Report promises enhanced efforts to keep Congress, committees, and staffs properly informed. This effort, it claims, will include detailed reports on substantive contents typical of all major acquisition programs, numerous special reports per year, and support for Government Accountability Office studies.

*Strengths, Shortfalls, and Lingering Issues.* The BMDR Report provides the best, most comprehensive DOD analysis of missile defense issues and programs released to the public in many years. Its importance is reminiscent of the famous DOD Damage Limitation Study of 1964, which was a classified study whose landmark contents were publicly released in Secretary of Defense annual posture statements over a period of 4 years. The main effect of the study was to close the door to major BMD deployments because they allegedly were too expensive, too ineffective, and likely to intensify the nuclear arms race. For 35 years after, the United States deployed no missile defenses, trusting nuclear forces to deter nuclear attack. The BMDR Report, in contrast, changes the longstanding U.S. strategic calculus by opening the door to building new but limited BMD defenses that are designed not to protect against Russia's still large nuclear posture, but instead to defend against the smaller, but potentially menacing, offensive missiles of such regional adversaries as North Korea and Iran. Using U.S. missile defense commitments as an important new instrument for achieving greater security in key regions introduces a sea change in U.S. defense strategy, whose implications will take a long time to be fully understood and mastered and will generate a host of technical and strategic issues that will be studied and debated in the coming years. The BMDR Report should be judged in the context of its attractive promises and potent contents, as well as the new and unsettled issues it raises.

Whereas DOD's initial foray into BMD defenses was the 2002 decision to deploy a small GMD posture to protect the U.S. homeland from small-scale missile attacks, the BMDR Report shifts attention away from the GMD posture of 30 ground-controlled interceptors already deployed in

Alaska and California. Instead, it focuses on deploying a larger posture of different missile interceptors that can defend U.S. military forces as well as allies and partners in multiple regions: Europe, Asia, and the Middle East. The centerpiece of this new regional strategy is the SM-3 missile, which originally was intended to protect U.S. warships from missile attack, but now is intended to protect entire countries and regions from enemy missile threats and attacks aimed at cities and other vulnerable targets. The SM-3 program is not the sole beneficiary of the new missile defense strategy, but it is the main beneficiary when judged in strategic and budgetary terms.

The viability of the new strategy depends heavily on anticipated improvements to the technical performance capacity of the SM-3. As many studies have pointed out, the act of employing “hit to kill” technology to shoot down enemy missiles and warheads during their midcourse trajectories is anything but easy; it requires precise hits against targets flying at very fast speed. In recent years, considerable progress has been made on developing the necessary technologies and systems, but as the BMDR Report acknowledges, the current SM-3 Block IA interceptor’s capabilities against emerging missile threats are only modest. As a result, the BMDR Report calls for vigorous RDT&E efforts to field successor models. Of these, the Block IB is to be available in 2015 and the more capable Blocks IIA and IIB around 2018–2020. Much depends upon the ability of ongoing RDT&E programs to meet this schedule, but at best, the improved SM-3s are not to be available for 5 to 10 years. Whether this development and deployment schedule will be fast enough to counterbalance adversary efforts to field nuclear-tipped missiles is yet to be seen. Even if this schedule proves adequate, the BMDR Report acknowledges, DOD will face a demanding management agenda to produce improved SM-3s that are effective and affordable. The new DOD management structure seems aligned with meeting this challenge, but only future results will tell.

In gauging the future SM-3 posture, a key issue arises: How many SM-3 interceptors will be needed, how many will be available, and how are they to be fielded? Today, SM-3 interceptors are mounted aboard Aegis

warships. Although each Aegis ship can carry multiple SM-3 launchers, currently the Navy has only about 25 such ships in its inventory, and at any given time, only about one-third of them will be deployed abroad. If they are scattered among European, Persian Gulf, and Asian waters, only two to three Aegis warships will be available in each region. To handle this constraint, the BMD Report calls for a mobile practice that relocates these ships in ways that can increase SM-3 concentrations in a single theater to meet the demands of a crisis. But a strategy of rapid relocation means that other theaters could be deprived of SM-3 defenses needed for deterrence and defense in normal peacetime conditions, as well as simultaneous crises. DOD is endeavoring to increase the number of current warships equipped with Aegis radars and launchers, but in future years, construction of additional Aegis ships might be needed—a trend that could bolster arguments for a larger Navy. Beyond this, DOD is proposing to deploy Aegis systems and SM-3 missiles ashore at two sites in Europe. Expansion of this shore-based practice seems likely to spread to Asia and perhaps the Middle East. Moreover, key allies (for instance, NATO Allies in Europe and Japan) are expected to acquire defense missiles of their own—if not the SM-3, then a comparable capability. The future remains to be seen, but when the total number of required SM-3s and other interceptors is added up, the result could be larger missile defense inventories than were foreseen only a few years ago.

Another issue revolves around how much defense capability the future posture of SM-3s and other missile interceptors will provide. Ideally, they should furnish an impregnable roof over regional allies and partners. But the complex physics and mathematics of hit-to-kill practices mean that while numerous enemy missiles can theoretically be shot down, a barrage attack is likely to produce a few that escape and hit their targets. A strong but not impregnable missile defense posture may be potent enough to deter enemy attack in most cases, but most likely, the act of ensuring deterrence in all cases will require a U.S. strategy of still relying upon the threat of nuclear retaliation against aggressors. Indeed, a strategy that relies only upon potentially leaky

missile defenses could leave aggressors free to launch missile attacks with impunity, with confidence that they likely will succeed to some degree, and that, in any event, they will not suffer reprisals. As a result, the future likely will yield a U.S. strategy that combines nuclear forces and widespread missile defenses in a setting of proliferating adversary nuclear-tipped missiles. Indeed, some adversaries may enlarge their offensive missile inventories to offset U.S. missile interceptors. Perhaps such an outcome will provide strategic stability, but the BMD Report does not seem poised to ease the transition to a nuclear-free world as envisioned by the Nuclear Posture Review Report. If so, it seems likely to produce a more complex international security system than exists today, one with new dangers of its own.

Yet another issue is whether allies and partners will perform the roles expected of them in the new missile defense strategy. When the decision to cancel the GMD Site Three in Poland and the Czech Republic was announced, several East European and Baltic members of NATO perceived that the step was intended to mollify Russian objections to GMD in Europe. These countries expressed worry, couched in historical memory, that the U.S. decision would leave them exposed to Russian political and military measures. Announcement of the SM-3 PAA for Europe helped quiet these fears and provide reassurance that Europe will be defended against future missile threats from Iran. But while the PAA is intended to form the U.S. contribution to European missile defense, it is expected to be accompanied by complementary missile defense efforts by NATO Allies. At the moment, NATO has its ALTMD concept, but no NATO members have plans and programs to field midcourse interceptors comparable to the SM-3. Appropriate burden-sharing seems likely to mandate European financial contributions to the U.S. PAA. This could require deployment of European defense missiles if the PAA does not provide enough SM-3s to defend the entire continent against future threats. But Europeans face tight budget constraints in ways that could leave them reluctant to spend sizable amounts on missile defenses. If they do not contribute in meaningful ways, the United States could find itself providing missile defense to Europe alone, a development that would add further strains to the already stressed transatlantic relationship.

Similar issues arise in gauging the reactions of allies and partners in Asia and the Middle East.

In Asia, Japan is participating robustly in the U.S. SM-3 program, but South Korea has only begun to consider its requirement for missile defenses, and the same conclusion applies to Australia and other regional allies and partners. The looming prospect is that most of these countries could be threatened by not only Chinese nuclear missiles but also those of North Korea. Defending Europe against new era missile threats from Iran is relatively easy because Europe is small and compact—a modest posture of properly situated SM-3s and other interceptors can provide a protective umbrella over the entire continent. But the Asia-Pacific region is another matter as its island countries are mostly separated by long distances. Short of each country building its own missile defenses or relying on each other for deterrence and defense, protection of this entire vast region will have to be handled mainly by U.S. SM-3 interceptors. While such area coverage by SM-3s may be a manageable proposition for the U.S. military, the act of protecting multiple countries from the same threats raises questions about whether the existing U.S. pattern of purely bilateral treaties with allies can continue to suffice. A collective U.S. missile defense concept could mandate creation of some form of multilateral alliance. So far, enhanced multilateral defense planning has made only initial progress across Asia. Wrestling with the collective and multilateral implications of region-wide U.S. missile defense could become a defining challenge in future U.S.-Asia security affairs.

What applies to Asia holds doubly true in the Middle East and Persian Gulf, where bilateral U.S. security relationships, not collective security, are the dominant pattern. If Iran emerges as a nuclear-armed power in ways mandating U.S.-provided missile defenses across the region, some form of collective multilateral collaboration will be needed. Creating it could be easier said than done.

Finally, how will Russia and China react to a U.S.-led effort to deploy SM-3 missile defenses across multiple regions, including in their own back

yards? Thus far, Russia has expressed satisfaction with cancellation of GMD Site Three, and it does not seem to fear an initial SM-3 deployment that will be located in southern Europe and pointed further southward. But if SM-3 radars and interceptors begin appearing in northern Europe in ways that could menace Russian nuclear missiles, the government in Moscow can be expected to react negatively. Under the New Strategic Arms Reduction Treaty (START), the Russians will still have ample nuclear missiles to overpower modest SM-3 defenses. For example, a Russian posture of 700 strategic delivery vehicles and 1,550 nuclear warheads would not be menaced by 100 U.S. SM-3 missile interceptors in Europe. But will this continue to be the case as SM-3 defenses grow in number and capability, even as future U.S.-Russia arms control negotiations strive for deeper reductions in offensive missiles? As the BMDR Report acknowledges, future negotiations will need to address both offensive and defensive forces if stability is to be enhanced. But reaching an accord with Russia may be a difficult task that could compromise the quest for deeper nuclear cuts. A similar judgment applies to future relations with China. Although current U.S. concepts for deploying SM-3 missiles in Asia are mainly focused on protection against North Korea, modest numbers of them could menace China's currently small nuclear posture. Will China react by enlarging its nuclear posture, or will U.S. discussions with China produce a mutual understanding that leaves China's arsenal secure but Asian allies and partners protected from North Korea? Such an understanding is a desirable goal, but whether it can be achieved is uncertain.