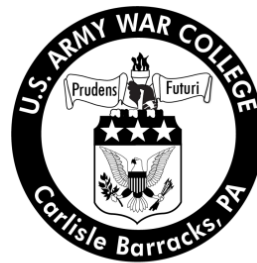


Missile Defense Capability: Can We Effectively Counter the Threat?

by

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United States Army War College
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USAWC STRATEGY RESEARCH PROJECT

**MISSILE DEFENSE CAPABILITY: CAN WE EFFECTIVELY COUNTER THE
THREAT?**

by

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ABSTRACT

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Recent economic conditions have impacted a myriad of defense budgets around the world. The demand for savings has caused the United States, as well as some of its allies, to reconsider defense spending across a number of different capabilities. Among many weapons systems that require technology that is constantly changing, missile defense is certainly one that necessitates ongoing funding to deal with both advances in product development, as well as increases in inventory by current or potential adversaries. This paper will examine current U.S. and Allied missile defense capabilities and strategies to determine if they are sufficient to protect against an adversary's attack. This examination will include a review of current U.S. and Allied missile defense strategy, as well as a comparison of that defensive capability against the offensive capability of current and potential adversaries. It will also identify potential gaps that exist and make recommendations for the way forward in missile defense capability for the U.S. and Allies.

MISSILE DEFENSE CAPABILITY: CAN WE EFFECTIVELY COUNTER THE THREAT?

The threat posed by ballistic missile delivery systems is likely to increase while growing more complex over the next decade.¹

—Ballistic Missile Defense Review Report

Protection of the homeland is one of the fundamental principles for any modern nation-state. This idea is timeless and dates back to the beginnings of time when man defended his hunting ground so that he could have both sustenance and security. That concept still holds true today, albeit in a much broader context. The United States Constitution explicitly states that one of the roles of its government is to provide for the common defense. To that end, modern defense forces must provide capabilities that cover the land, air, sea, space and cyber domains. Given the proliferation of weapons of mass destruction and the emerging nuclear capabilities around the globe, it is worthwhile to examine potential delivery systems for those weapons.

The ballistic missile is becoming the weapon of choice to inflict panic and terror, while also serving as a potential delivery means for chemical or biological weapons of mass destruction (WMD). Today, over twenty-five states already possess ballistic missiles, with a number of them developing the capacity for indigenous production and, potentially, for export. Many of these states are continuing to develop these weapons' capacity for increased payload, while also working towards longer range and better accuracy. Some of these same nations are also pursuing nuclear, biological or chemical weapons, highlighting the important link between ballistic missiles and WMD programs.²

The inventory of ballistic missiles around the world has allowed adversaries to be able to extend their reach to well beyond traditional geographic boundaries and in

several instances around the globe. The international marketplace in which we now live has also allowed for the transfer and sale of both technology and complete weapons systems to those who are willing to pay for them. The relative small cost of production and procurement of ballistic missiles compared against the investment needed to counter them makes this a weapons system of choice for developing countries. With the volatility of many governments that we have witnessed recently, especially with events such as the Arab Spring, the possibility of weapons falling in to the hands of violent non-rational actors or religious extremist organizations is very real. When we add a nuclear capability to this situation, the consequences become even greater. President Obama recently stated that “the greatest threat to U.S. and global security is no longer a nuclear exchange between nations, but nuclear terrorism by violent extremists and nuclear proliferation to an increasing number of states.”³

In this paper the author will discuss the missile defense capability of the United States, as well as the capabilities of key allies. More specifically, the author will present a brief background and history of missile defense, as well as detailing modern usage and capabilities. He will then examine the capabilities of current and potential adversaries and make some assessments on the adequacy of our current policies and capabilities. Finally, the author will explore options for a way forward including policy recommendations as well as changes in weapons system approaches to ballistic missile defense.

Background

The United States began its program of missile defense after the Second World War. This was a direct result of the successful use of V-2 Rockets during the WWII by the Germans against England in September 1944. The U.S. realized that this capability

could eventually be developed into a long range weapon, and began building a capability to defend against it. "In 1946, while serving as Army Chief of Staff, Eisenhower visited Fort Bliss, Texas, where some of the earliest work on missile defense was taking place."⁴ Later, after he was elected President, work began on the initial stages of the United States' ballistic missile defense program under his administration. Intercontinental ballistic missiles (ICBMs) were still many years away from becoming a reality at that point, but the threat of short-range missiles was clear and present. Documents seized after WWII indicated that Germany had developed detailed plans to conduct an attack against the United States from a ship launched rocket.⁵ This was merely an extension of the tactics used successfully across the English Channel against England. Both the U.S. Army and the Air Force were developing systems to counter the ICBM threat; however there was no program oversight integrated at the War Department level. As the Cold War developed in the mid-fifties, the former Soviet Union showed evidence of the capability to deploy long range missile systems. "In 1955, intelligence reports of an impending Soviet ICBM threat spurred the Department of Defense to launch a major ballistic missile development program to match the Soviets."⁶ Concerns over the USSR's missile program would continue for many years to come.

On January 16, 1958, the National Security Council placed a ballistic missile defense system as a matter of highest national priority through their NSC 5802 position paper on continental defense.⁷ In 1962, the Cuban Missile Crisis brought the possibility of a missile attack against the continental United States to light for Americans. For those thirteen days in October, the U.S. was closer to a nuclear attack than it ever had

been during the Cold War. The need for missile defense for the homeland was reinforced during this crisis and efforts continued on weapons systems to accomplish this mission.

Missile defense development efforts continued under President Nixon's administration. In 1968, the program called Safeguard was instituted, with the aim of protecting U.S. ICBMs in their silos near Grand Forks, North Dakota.⁸ This program was terminated in 1975 shortly after it became operational due to limits imposed by the 1972 Anti-Ballistic Missile treaty.⁹ It is important to note that this system was a defensive measure deployed to provide point protection to U.S. offensive ICBMs and not to protect areas or populations.

As the Cold War with Russia lingered on, a large scale effort on missile defense was conducted under the Reagan administration. Much work was accomplished after the publication of the NSC position paper and the termination of the Safeguard program. This included the establishment of an organization within the Department of Defense (DoD) to provide oversight and coordinate missile defense across all of components within the department. Established in 1984, the Strategic Defense Initiative Organization (SDIO) was the first formal organization to group all of the existing DoD programs underway for missile defense. SDIO was a result of the SDI program under the Reagan Presidency. SDIO's name was changed in 1994 to the Ballistic Missile Defense Organization and then again in 2002 to the Missile Defense Agency.¹⁰ The reorientation and changes in the name over the years reflected the gradual change in U.S. policy and strategy that took place over that period of time. It changed from a very ambitious and costly program, complete with laser technology and space-based

sensors and kill vehicles, to a more modest family of ground and sea-based assets, although still employing space assets to detect launches.

Current U.S. and Allied Capability

The current statement of U.S. policy on missile defense was issued in 1999 and signed by President Clinton. It states:

It is the policy of the United States to deploy as soon as is technologically possible an effective National Missile Defense system capable of defending the territory of the United States against limited ballistic missile attack (whether accidental, unauthorized, or deliberate) with funding subject to the annual authorization of appropriations and the annual appropriation of funds for National Missile Defense.¹¹

President Obama has not changed the official 1999 published policy, but has outlined a strategy that reflects the need for defense of the homeland, as well as our allies and partners. The current strategy also addresses the need for fiscal responsibility in the area of missile defense and the necessity to assure extensive testing on weapons systems against present and predicted future threat profiles. Finally, the missile defense policy recognizes that cooperation with other world powers, namely Russia and China, should take place. This U.S. policy on missile defense has six components.

First, the United States will continue to defend the homeland from limited ballistic missile attack. Second, the United States will defend U.S. deployed forces from regional missile threats while also protecting our allies and partners and enabling them to defend themselves. Third, before new capabilities are deployed they must undergo testing that enables an assessment under realistic operational conditions against threat-representative targets to demonstrate that they can reliably and effectively help U.S. forces accomplish their mission. Fourth, the commitment to new capabilities must be fiscally sustainable over the long term. Fifth, U.S. BMD capabilities must be adaptable to future threats and flexible to adjust as the threats change. Sixth, the United States will seek to lead expanded international efforts for missile defense.¹²

The United States currently has several weapons systems to counter ballistic missile threats. These systems can be broken down into three different categories.

The first category consists of radar and satellite equipment to detect the launch and flight path of the missile and is commonly referred to as the sensor component of Ballistic Missile Defense (BMD). The second component of BMD, called the interceptor, is the actual kill vehicle that is launched against an inbound ballistic missile. The final category of BMD is the command and control architecture that links the previous two components together in order to allow for a successful engagement of the inbound missile. Known as the Command, Control, Battle Management, and Communications (C2BMC) program, this is “the overarching control that brings together information from the various sensors, provides planning capability for missile defense operations, and makes available situational awareness for all levels of decision making.”¹³

The capability for BMD falls upon three different service components within the Department of Defense. The U.S. Air Force has several capabilities in the sensor category. The Cobra Dane radar and the Upgraded Early Warning Radar both provide data on midcourse flight path to an interceptor system. The U.S. Navy has capabilities in both the sensor and interceptor categories. The Sea Based X Band Radar is a mobile platform and is capable of providing midcourse flight information to interceptors. The Aegis weapons system is a complete sensor and interceptor package deployed aboard select U.S. Navy ships. The system is comprised of radar and a missile system capable of acquiring, tracking, and engaging an inbound ballistic missile.

The PATRIOT Missile system continues to be the mainstay of the BMD arsenal for the U.S. Army. It is also a sensor and interceptor package and has been combat proven in Operations Desert Shield and Desert Storm. Since its’ inception, it has gone through many upgrades, both in terms of hardware and software. Another capability

within the Army is the Theater High Altitude Air Defense (THAAD) system. Like the PATRIOT, THAAD is also a sensor and interceptor package. The final BMD weapon that has recently been installed is Ground-based Midcourse Defense (GMD). With interceptors at Fort Greely, Alaska and Vandenberg Air Force Base, California, the GMD system is primarily focused on threats emanating from North Korea and Iran. “Today, 30 operational GBIs protect the United States against a medium ICBM raid size launched from current regional threats.”¹⁴ Current allocation has 26 GBIs located in Alaska, with the remaining 4 located in California.¹⁵ Integrating multiple sensors, “the system now includes assets located across 12 time zones that are linked by more than 20,000 miles of fiber-optic cable.”¹⁶

One of the pillars of the U.S. missile defense strategy is international partnership. The U.S. has key allies within each region who have purchased weapons systems and remain committed members of an international effort to counter proliferation of ballistic missiles, while also providing for the defense of their borders and citizens. In the Pacific region, the threat comes mainly from North Korea. South Korea, officially the Republic of Korea (RoK), and Japan are active partners with the U.S. With military bases, deployed forces and family members in both countries, the RoK and Japan are clear priorities for BMD. The RoK currently has defensive capabilities with Aegis ships and PATRIOT missile systems. “Japan has acquired a layered integrated BMD system that includes Aegis BMD ships with Standard Missile 3 interceptors, Patriot Advanced Capability 3 (PAC-3) fire units, early warning radars, and a command and control system.”¹⁷ Finally, Australia has acquired the Aegis ballistic missile defense system and is working with the U.S. to field interceptors in the near future.

In the Middle East, a number of countries have partnered with the U.S. in BMD. Through regional alliances, such as the Gulf Cooperation Council (GCC), the U.S. seeks continued support in countering threat ballistic missiles, while also protecting deployed forces and other interests in the region. GCC members currently consist of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (UAE). “A number of states in the region already deploy PATRIOT batteries and are exploring purchases of some missile defense capabilities under the auspices of the foreign military sales (FMS) program.”¹⁸ The UAE has worked with the U.S. and is purchasing both PATRIOT and THAAD BMD systems.

Although not a member of the GCC, Israel has worked closely with the United States in developing a tiered approach to missile defense. “Israel's missile-defense program is by far the most advanced and ambitious in the Middle East.”¹⁹ Suffering a direct attack by SCUD missiles in 1991 during the U.S. led coalition against Iraq, Israel remains vigilant and aggressive in their BMD program. They have acquired the PATRIOT missile system and have worked jointly with the U.S on development of an upper-tier BMD system known as Arrow.

With the larger number of allies in Europe, as well as a previous strategy outlining deployed forces, the Obama Administration has developed a theater-specific strategy for the region. This latest approach to missile defense in Europe is called the Phased Adaptive Approach (PAA). The PAA is a departure from the previous strategy which called for ground-based sensors and missile fields deployed and maintained overseas in Europe. PAA is accomplished with a mixture of sea-based assets and rotational forces, thereby eliminating any permanent U.S. missile defense footprint in

Europe. This alleviates some concerns by Russia “that U.S. missile defenses adversely affect their own strategic capabilities and interests.”²⁰ Furthermore the PAA states that “this approach is based on an assessment of the Iranian missile threat, and a commitment to deploy technology that is proven, cost-effective, and adaptable to an evolving security environment.”²¹

The U.S. has worked extensively in Europe for BMD partnerships. In Denmark, the Thule Upgraded Early Warning Radar exists as a part of the sensor network. The Netherlands have purchased the PATRIOT missile system, as well as cooperating with the U.S. on maritime BMD studies. Both Poland and Romania have agreed to host the “Aegis Ashore” weapons system, a “planned future land-based component of the Ballistic Missile Defense System.”²² The United Kingdom hosts the Fylingdales Upgraded Early Warning Radar, another networked BMD sensor. Finally, the U.S. has also partnered with Turkey in the area of BMD. “Turkey has agreed to host an early-warning radar as a key part of the European Phased Adaptive Approach”, building on existing networked sensor capability for the region.²³

Adversary Policy and Capability

When examining ballistic missiles within the current environment, it is easy to see that technology transfer and our global economy have had an impact.

There has been an increase of over 1,200 additional ballistic missiles over the past 5 years. The total of ballistic missiles outside the United States, the North Atlantic Treaty Organization (NATO), Russia, and China has risen to over 5,900. Hundreds of launchers and missiles are currently within the range of our deployed forces today.²⁴

When we define threat ballistic missiles, the United States classifies them into four categories based on their range. The first, called intercontinental ballistic missiles (ICBMs) are those threats that can reach the continental United States. The range for

these missiles exceeds 5,500 kilometers. The remaining three categories of ballistic missiles pose a regional threat to areas such as the Middle East or the Korean Peninsula. These can either be short (less than 1,000km), medium (1,000-3,000km), or intermediate (3,000-5,500km) range missiles that are a potential threat to a regional partner, deployed U.S. forces, or allies.

“Today, only Russia and China have the capability to conduct a large-scale ballistic missile attack on the territory of the United States, but this is very unlikely and not the focus on U.S. BMD.”²⁵ Of concern however, is the ballistic missile program underway in North Korea. With several successful test flights of the Taepo Dong 2 missile, we should assume that it will not be long before they acquire the necessary range to reach the continental U.S. In the case of North Korea, the U.S. Director of National Intelligence (DNI) states “its export of ballistic missiles and associated materials to several countries...illustrate the reach of the North’s proliferation activities.”²⁶ North Korean long-range missile inventory includes both SCUD-B and C missiles, as well as the NO-DONG 1 missile. With this arsenal, they can reach up to 1300 kilometers, which includes all of the RoK and most of Japan. North Korea also possesses nuclear weapons, adding concern of a nuclear-capable missile to the current threat. With a recent change in regime in North Korea, the situation remains volatile for the near future.

When we examine the capabilities of China, it is estimated that “by 2015 it will have deployed tens to several tens of missiles with nuclear warheads targeted against the United States, mostly more survivable land- and sea-based mobile missiles. It also will have hundreds of shorter-range ballistic and cruise missiles for use in regional

conflicts. Some of these shorter-range missiles will have nuclear warheads; most will be armed with conventional warheads.”²⁷ “China’s new submarine-launched Julang 2 has a range of up to 9,600 kilometers and, according to the U.S. Air Force’s National Air Intelligence Center, “will, for the first time, allow Chinese [missile submarines] to target portions of the United States from operating areas located near the Chinese coast.”²⁸

In the Middle East, Iran is considered the largest threat. The DNI states that “Iran already has the largest inventory of ballistic missiles in the Middle East, and it is expanding the scale, reach, and sophistication of its ballistic missile forces, many of which are inherently capable of carrying a nuclear payload.”²⁹ With recent Iranian rhetoric about closing and controlling access to the Strait of Hormuz and ongoing tension between Iran and Israel, the inventory of Iranian ballistic missiles will remain a concern for the foreseeable future. It is estimated that Iran currently has SCUD-B and C, as well as Shahab-3 missiles. With ranges from 300 to 1900 kilometers, Iranian missiles pose a constant threat to the region. “Syria continues to field updated Short-Range Ballistic Missile (SRBM) systems and acquire Scud-related equipment and materials from North Korea and Iran”, activities that continue to threaten U.S. forces and allies in the region.³⁰ Ongoing struggles between Syrian leadership and its populace point to even greater tensions in the Middle East region.

The ability of a non-state actor to enter into the ballistic missile threat category should not be dismissed. As with the German plans during WWII, a ship-mounted launcher with even a short range ballistic missile could pose a threat to the U.S. or its allies. “The ship-based threat includes both ships that enter our ports and vessels near our shores but outside our territorial waters, from where Scud-type missiles with 200-

600 kilometer ranges could be launched with devastating effects against our coastal cities.”³¹ Although this is a low probability event, the consequences of an attack of this type could be devastating, especially if it targeted a nuclear facility or population center.

Gaps between Friendly and Threat Capabilities

The current National Military Strategy accepts the fact that the U.S. can only counter a limited number of threat ICBMs against the homeland. Given current threat inventories, this may not be a safe strategy. The ballistic missile inventory in North Korea, as well as Iran and Syria, indicate that we should be prepared to defend against these threats in great numbers. Using the technique of salvo firing of several missiles nearly simultaneously, a well coordinated attack against the United States and/or Canada could easily expend the 30 GBIs that are operational in Alaska and California. Clearly, we cannot match interceptor inventory with threat ballistic missiles on a one-for-one basis, but there is likely some middle ground to lessen the current gap.

The situation becomes much more problematic when we begin to review the threat from regional ballistic missiles. The danger here is both to our allies directly, as well as our deployed U.S. forces and military infrastructure. For our forces deployed in the Pacific, the threat from North Korea and potentially China is real and present. Current missile defense capabilities include U.S. Patriot batteries deployed in a point defense of U.S. bases. Here again, a well coordinated attack with numerous ballistic missiles could eventually deplete stocks of missiles.

In the Middle East, the situation is potentially much worse. With Iran and Syria having an abundance of short, medium, or intermediate range missiles, attack within the region is a constant possibility. Tensions in the region continue with each new occurrence of a terrorist attack, embassy bombing, or murder of a nuclear scientist.

The Iranian desire to continue their nuclear program also exacerbates an already complicated situation in the region. In recent rhetoric, Iran claims that they will fire 150,000 missiles against Israel if Israel launches an attack against them.³² The U.S. has worked closely with Israel to develop and field several ballistic missile defense systems, but here again the inventory of interceptor missiles will be the problem. A salvo of well-coordinated missile launches could easily overwhelm both the personnel and weapons systems involved in engaging the inbound threats. Coupled with terrorist activities or those of Special Forces to damage key missile defense sites, a salvo attack could instill terror in a region within a very short time. One need only examine the impact of 38 SCUD missiles in Israel in 1991 on the psyche of the population. "In Tel Aviv, missile attacks had a psychological and political impact far out of proportion to the physical damage they caused."³³ The first missiles that penetrate the BMD architecture will have a dramatic effect on the population and confidence in the defenses will erode.

The gap between regional threat missiles and defensive missile inventories in the Middle East and in the Pacific region highlights the need for continued development and production of theater BMD weapons systems and interceptor missiles. Both the THAAD and PATRIOT missile systems are currently being used in this role, with the fielding of Aegis Ashore scheduled by 2015. The current plan according to the PAA indicates that there will not be full fielding of the architecture until 2020. This indicates that there will be a degraded capability, mostly to deal with ICBM threats, until that time.

Way Forward

As we look ahead to the future, we can certainly see no slowdown of research and development in the area of ballistic missiles. This includes proliferation among current owners, as well as developing countries and possibly non-state actors. The

U.S. clearly has policy in place, as well as a plan for the immediate future with the PAA. In order to effectively counter these current and emerging threats, the United States must look at a proactive combined approach using all elements of National Power.

In the context of diplomatic, information, military and economic (DIME) efforts, all facets must be used in a complementary manner to deter, dissuade or prevent adversarial use of ballistic missiles. Diplomatic efforts must be used to dissuade adversaries from continuing their development and production or procurement of ballistic missiles. We have several avenues with which to pursue diplomatic means. As a member of the United Nations (UN), we have a strong organization with a membership charter that supports our goals. As one of the five permanent members of the UN Security Council (UNSC), the U.S. can direct its diplomatic efforts through this forum. Through the Sanctions Committee, the UNSC could impose economic or trade sanctions, as well as diplomatic or financial restrictions.³⁴ The United States should use its' status on the UNSC to encourage allied participation in measures aimed at countries that continue to manufacture or distribute ballistic missiles.

Another avenue to pursue in the diplomatic realm is the Missile Control Technology Regime (MCTR), an international organization to help with efforts to deter proliferation. The MCTR "is an informal political understanding among states that seek to limit the proliferation of missiles and missile technology."³⁵ Established in 1987, the membership in MCTR has expanded from the original G-7 members to 34 countries, each with the goal of limiting proliferation of ballistic missiles. Though it has no legally binding ability to influence offending nations, it does offer a forum for members to share

information regarding trade and exports that could lead to actions in another organization or avenue.

The Hague Code of Conduct (HCOC) is another forum to counter the proliferation of ballistic missiles. “The HCOC is aimed at bolstering efforts to curb ballistic missile proliferation worldwide and to further delegitimize such proliferation.”³⁶ With 134 member nations as of October 2011, this instrument’s aim is to work towards disarmament and non-proliferation on a global scale, particularly focusing on ballistic missiles capable of carrying WMD. The HCOC has also been endorsed by the UN, tying it to an existing international organization with a capability of punitive measures as previously discussed.

Through an effective information campaign, the U.S. should continue to assure our allies that we remain committed to their protection from ballistic missile attack, while also messaging adversaries regarding our superior capabilities. Ongoing national and international exercises send a clear message to adversaries about U.S. and Allied missile defense capabilities. The U.S. continually publishes information about these exercises, as well as weapons system development efforts. Testing and intercept data is also published for the world to see. As an example, all of the information contained in this paper is the result of open source material and internet searches that are freely accessible to our adversaries. Strategic communication efforts by leaders within the U.S. and its allies should be aimed at deterrence and demonstrating resolve to deal with ballistic missile proliferation and usage.

In the military arena, the U.S. should continue its’ current missile defense exercises with key partners. These events serve to not only increase partner capacity

and cooperation, but to also send a strong signal to adversaries regarding the capabilities of the U.S. and its allies. As an example, the United States and Israel have conducted exercise Juniper Cobra since 2001. This exercise integrates U.S. and Israeli interceptors, radars and other systems to defeat threat ballistic missiles.³⁷ These exercises are well publicized and send a strong message about U.S. commitment in the region. In a NATO construct, BMD exercises also serve to demonstrate resolve and capability. In exercise Joint Project Optic Windmill, the concept of layered ballistic missile defense has been demonstrated since 1996 between the U.S., the Netherlands, and Germany.³⁸

Another military capability involves use of the U.S. Navy in Freedom of Navigation (FON) exercises. Guided missile cruisers performing FON in the Mediterranean Sea or the Persian Gulf demonstrate resolve and commitment to ballistic missile defense while actively contributing to the BMD architecture. Operating in international waters, they need no host-nation agreements that ground-based units are required to coordinate. Finally, ongoing efforts in space provide yet another military resource. Currently limited to sensor-only capability, space-based missile defense assets continue to let adversaries know that the U.S. has advanced weapons systems that are highly interoperable; they provide a defense in depth to our homeland and our allies. The overarching military command and control structure provides national leadership and the military with a range of options to respond to ballistic missile threats. The ability to share launch points and predicted impact points within a global community should go far in deterring an adversary from launching a ballistic missile.

In the economic area of national power, sanctions could be yet another effective means to deter or dissuade the proliferation of ballistic missiles. As previously discussed, the UN is one organization that could be used for sanctions. Additionally, Chapter VII of the United Nations Charter clearly allows for members to take direct “action with respect to threats to the peace, breaches of the peace, and acts of aggression.”³⁹ Continuing efforts with sanctions against offending nations should be used to deter production or sales of ballistic missiles. The U.S. can also work in a bilateral forum with trade partners of offending nations. Incentives to stop trading with an adversary may be an option, or sanctions against the trade partner himself may be in order. Given the prevalent audit trail behind most transactions in our global economy, it should not take a large forensic effort to identify those who are trading with a suspected offending nation or non-state actor.

Finally, the U.S. should continue funding current missile systems that have been fielded to sustain capabilities that each system provides. This funding should include upgrades to hardware and software, as well as production of missiles and support equipment. Support for both homeland defense systems to counter ICBM threats, as well as stationary and mobile theater BMD assets should be sustained for the foreseeable future. The U.S. should also consider reviving the space-based interceptor capability that was planned under the SDI program in the 1980s. With advances in technology and the space program, it is worthwhile to again put efforts towards research in this area.

Conclusion

With the National Intelligence Estimate painting a grim picture for the future in the area of ballistic missile proliferation, it will be important to confront this problem

asymmetrically. The U.S. should continue its' current efforts in ballistic missile defenses, both in research and development, as well as support to currently fielded systems. It should also make use of all elements of national power to deter or dissuade adversaries from reliance on ballistic missiles as a part of their offensive arsenal.

Economic efforts should be targeted to make production of ballistic missiles an unviable option in countries with limited financial means. Finally, the U.S. should leverage its international partners, both from a weapons system architecture perspective, as well as engaging their efforts to help stem proliferation on the global front. Used effectively and in an enduring fashion, economic and diplomatic tools should help the international community to reduce the threat in this area. While no world power can presume to stop the threat of ballistic missile attack, the U.S. and her allies can do much to curb proliferation.

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