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BALLISTIC MISSILE DEFENSE AND DETERRENCE: NOT MUTUALLY EXCLUSIVE

BY

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There is a large body of scholarly work on deterrence theory, specifically as it relates to nuclear weapons. The interaction between strategic ballistic missile defense and nuclear deterrence has been extensively debated, but the majority of those debates and the broader discussion of nuclear deterrence has been done predominantly within the context of the Cold War. The post-Cold War era includes so called “rogue nations” and non-state actors which have, or will have, access to nuclear weapons, some of which are deliverable via ballistic missiles. A fundamental pillar of deterrence theory is that the parties involved are rational actors. In the post-Cold War era, “rogue nations” and non-state actors may not be rational, and thus, may or may not be deterrable. This situation makes a strong case for a strategic ballistic missile defense system, both as a hedge against a non-rational actor, and to introduce an element of uncertainty into their calculus. Provided this missile defense system remains small, it will improve U.S. national security while not undermining traditional nuclear deterrence.

BALLISTIC MISSILE DEFENSE AND DETERRENCE: NOT MUTUALLY EXCLUSIVE

The concept of deterrence has been studied and debated extensively over the past fifty years, and has formed the foundation of much of the U.S. national security strategy during the Cold War. With the end of the Cold War, the study of deterrence fell out of favor. As General Kevin Chilton, Commander, U.S. Strategic Command noted in his recent congressional testimony, "Since the end of the Cold War, however, the serious study of deterrence theory and strategy has been inadequate. Much like our changing global context, modern deterrence challenges necessitate more complex approaches."[1]

In many ways, the world is a much more dangerous place now than it was during the Cold War. The Cold War featured a bi-polar world with massive arsenals of nuclear weapons held by the U.S. and the former Soviet Union. While there were other minor players on the international scene, world politics was dominated by the two super powers. In comparison, the current world situation is much more complex, with regional powers and non-state actors dominating much of the rhetoric on the international stage. The "nuclear club" has grown since the end of the Cold War, and it continues to grow. Not all of the new members are friendly to the U.S. and many actively oppose U.S. interests.

The threat of a transnational terrorist organization obtaining a nuclear device grows daily. Yet, the study and application of deterrence theory seems to have fallen out of favor. Many have argued that deterrence kept the Cold War from getting hot. Others argue that it was unethical, leading to arms races and the repression of millions

of people under Soviet control. U.S. policy related to both deterrence and missile defense has, at various times, led to rancorous partisan debates resulting in major policy changes depending upon which party was in power at the time. Regardless, deterrence in general was a successful foreign policy and national security approach for the U.S., which begs the question: Is it effective in the current security environment, and what, if any impact does current missile defense policy have on deterrence? This paper will explore that question.

Deterrence Theory

Deterrence is the manipulation of an adversary's estimation of the cost/benefit calculation of taking a given action.[2] In simpler terms, it means to compel an adversary to do something or to prevent them from doing something based on a credible threat. If that threat is carried out, the resulting loss will be more than the adversary is willing to accept for the gain associated with the action attempting to be deterred. Simply put, if the cost is too high, the adversary is deterred from taking action.

One inherent problem with this approach is that it can create a security dilemma. If one country deploys a strong deterrent, it can frighten the other country, causing it to deploy an even stronger deterrent. This action-reaction process is termed the spiral model, and is the reason that reassurance is as important as deterrence.[3] While threatening to use force to deter, the competing countries must provide reassurance that they will not attack first. Otherwise, the resulting arms race will actually reduce stability, and will be very costly economically for the countries involved.

Deterrence can be used in many situations, but its most famous implementation came during the buildup of the Cold War nuclear arsenals of the U.S. and Former

Soviet Union. In this case, each side was deterred from attacking the other by the threat of a devastating nuclear retaliatory strike. Because of their rapid response time, accuracy and difficulty to intercept, intercontinental ballistic missiles (ICBMs) became the cornerstone of Cold War nuclear deterrence.

U.S. national security policy during the Cold War was heavily influenced by deterrence theory. There were two competing schools of thought led by two innovative thinkers, Nobel laureate Thomas Schelling and Herman Kahn. Schelling favored a "stable" balance of terror vis-à-vis the Former Soviet Union, orchestrated to achieve mutual prudence through mutual vulnerability.[4] To achieve this, he advocated a modest nuclear arsenal and absolutely no defenses; not even civil defense of the population was allowed, as having no defenses would contribute to the fear of a surprise attack. This fear of a surprise attack was a key element in his vision of "stable" or "existential" deterrence. Schelling argued that U.S. defensive capabilities could cause deterrence instability by leading the Soviets seek an advantage by striking first.[5]

In contrast, Herman Kahn specifically recommended against a "stable" balance of terror; rather, he advocated a requirement for U.S. strategic defensive capabilities to establish an asymmetric imbalance of terror favoring the U.S., and thus deterring the Soviets. His theory was known as "extended" deterrence; he emphasized these defensive capabilities both in support of U.S. deterrence but also as a hedge against the failure of deterrence- a shooting war.[6] Therefore, Khan was a firm supporter of U.S. civil defense and of deploying air and missile defenses to thwart any potential Soviet Attack.[7] In an interesting side note, Kahn, an analyst for the RAND Corporation, was the inspiration for the style and personality of the title character in the classic movie *Dr.*

Strangelove.[8] In addition to Schelling and Khan, there were a number of other deterrence theorists engaged in the discussion; however, Schelling and Khan were the most prominent, and their analysis was instrumental in the development of U.S. deterrence doctrine during the Cold War.

One area of commonality between the Schelling and Khan schools of thought was the assumption that deterrence worked only when the parties involved were rational actors. Within the context of the Cold War, their assumption was that the states (the U.S. and U.S.S.R. in this case) were rational actors and that they made cost-benefit calculations about whether and when to initiate a conflict.[9] If one side or the other in a deterrence situation is not a rational actor, the theory breaks down because the non-rational actor's behavior cannot be predicted. For example, had the Soviets been non-rational, they may have attacked the U.S. in spite of the severe damage they would sustain in a counter-strike. In short, non-rational actors might not be deterrable.

Missile Defense History

As the deterrence debate raged, the U.S. began developing anti-ballistic missile (ABM) systems in the 1960's. Kahn's followers advocated a robust ABM system to protect the entire nation, while Schelling's camp was opposed to ABM systems, claiming that they were destabilizing and would exacerbate the arms race between the U.S. and U.S.S.R. A number of different systems and configurations were discussed during the administrations of Presidents Kennedy, Johnson and Nixon. Their designs varied from a full-scale defense of the U.S., to a limited system to defend against the emerging ballistic missile threat from China, to protection of the U.S. retaliatory capability.

The debates were very heated due to the differing views on the impact of an ABM system on deterrence, as well as the very high costs associate with deploying the system. Developing an effective ABM system was an extremely difficult problem given the technical state of the art in the 1960's. Due to the short flight times and extreme velocities involved, a number of new technologies had to be developed. Advances in missile boosters, radars, computers, and command and control systems came quickly; however, it would not be until the early 1970's that the U.S. was able to field a workable ABM system.

By the late 1960's, ABM systems had become a political "hot potato" in the U.S. Ultimately, a political compromise was reached when Congress approved President Nixon's decision to deploy the SAFEGUARD system. Originally designed to defend just the U.S. Intercontinental Ballistic Missile (ICBM) fields to ensure a retaliatory strike against the Soviets, SAFEGUARD was scaled back, initially to two sites and finally just one, located to protect the Minuteman ICBM fields in North Dakota. It was also offered as a thin-line defense against the emerging Chinese threat.

The SAFEGUARD system consisted of 100 nuclear-tipped interceptor missiles, two hardened targeting radars and a command and control system. Construction of the SAFEGUARD system began in 1970, and was completed and turned over to the U.S. Army in 1974, at a cost of $5923.1 million in then-year dollars.[10] The system reached full operational capability in September 1975. President Nixon used SAFEGUARD as a bargaining chip to obtain concessions from the Soviets during the negotiations leading to the Strategic Arms Limitation Treaty-I (SALT-I) and the Anti-Ballistic Missile (ABM) Treaty, both of which were signed in 1972.

The ABM Treaty did not ban all antiballistic missile systems. It permitted the research, development, and limited deployment of ground-based missile defense systems. As signed in 1972, each side was permitted two operational ABM sites, each with 100 ABM launchers and 100 ABM interceptor missiles, with associated radar, storage, and test facilities. A 1974 amendment reduced the number of permitted operational ABM sites to one per side.[11] By limiting each side to a maximum of one missile defense site with a total of 100 interceptors, the ABM treaty effectively left deterrence as the only real option to prevent the catastrophic damage a nuclear exchange would cause. The U.S. did not build a second site, and in 1975, Congress withdrew funding from the SAFEGUARD program, only allowing the Army to expend funds to decommission the system. SAFEGUARD was decommissioned in August 1976, after being operational for less than a year.

Following the cancellation of SAFEGUARD, research on missile defenses continued, albeit at a much slower pace. The Army's SAFEGUARD System Command was abolished, and was replaced with the Ballistic Missile Defense Organization (BMDO) to oversee further technology development.[12] While no longer a national priority, a new advocate, in the form of Ronald Reagan, began to re-shape the national debate on missile defenses and deterrence. By the time he ran in the 1976 Republican primary, President Reagan had developed a strong dislike for the concept of offensive-based nuclear deterrence.[13] Reagan felt that the concept of Mutually Assured Destruction (MAD) was insane, and that the U.S. should have the capability to protect itself instead of being held hostage. These thoughts eventually found their way into the

Republican platform in the 1980 election, in which Reagan opined that MAD limits the President's choices during a crisis to mass mutual suicide or surrender.[14]

Following his election, President Reagan pursued his dream of an alternative to MAD, culminating in his famous speech of March 23, 1983, in which he asked the rhetorical question, "Wouldn't it be better to protect the American people than to avenge them?"[15] With this speech, the pursuit of an alternative to deterrence became the policy of the United States.

The system President Reagan envisioned was a layered system of terrestrial and space-based weapons known as the Strategic Defense Initiative (SDI). The press quickly nicknamed this program "Star Wars", since it included space-based, directed-energy weapons as well as more conventional interceptors. SDI was primarily a research and development program, since the technology envisioned for the system did not yet exist. It was very controversial, both domestically and internationally, and it revived the strategic debate between the supporters of existentialist deterrence and those who favored extended deterrence.[16] SDI was a very vigorous program; an energized U.S. technical-industrial base responded, and they seemed to be on the verge of making major breakthroughs in sensors and high speed computers which would revolutionize warfare both on the ground and in space.[17] The Soviet leadership recognized that their technology base and economy simply could not meet this challenge; SDI is generally recognized as a key factor in forcing the Soviets to undertake fundamental changes in their political and economic systems, ending the Cold War.

Following President Reagan's term and the fall of the "iron curtain," interest in both missile defense and strategic deterrence began to wane. Many opponents of the military buildup during the Reagan years began calling for a "peace dividend," envisioning a slowdown in defense spending and increases in domestic programs. Reductions were made in strategic forces since the Soviets were no longer seen as a major threat to the nation. President George H.W. Bush responded to these changes in part by reducing the scope of SDI, and changing the name to Global Protection Against Limited Strikes (GPALS). As with SDI, critics remained concerned that missile defenses would undermine deterrence, and could lead to an arms race. GPALS continued as a research and development program; however, none of the elements were ever deployed.

Operation Desert Storm reignited the debate on missile defense, as the entire nation watched on television as Patriot missiles streaked into the air to intercept the SCUD missiles launched by Iraq. These missile attacks brought home to lawmakers the deadly reality of missile proliferation, and the perceived success of the Patriot missiles created the impression that an effective defense was possible.[18] This proliferation of ballistic missile technology, coupled with concerns that Iraq and other countries were actively pursuing weapons of mass destruction, led Congress to overwhelmingly approve the Missile Defense Act of 1991, calling for the deployment of an ABM Treaty-compliant defense as soon as it was technically possible.

Work on missile defense systems continued through the Clinton administration, but with a different set of priorities. The Clinton administration reversed the proportion of missile defense funding; under the Bush administration, about eighty percent of the

funding was focused on strategic defenses with the remaining twenty percent dedicated to programs supporting theater missile defense.[19] Under President Clinton, the twenty percent of the missile defense budget dedicated to strategic defense was focused on a "thin" system focused on the emerging threats from rogue states such as North Korea, Iraq and Iran. Much of this focus was the result of domestic political pressure; Republicans were pressing the administration very hard for more funding for missile defense programs.

Congress formed a blue ribbon panel to study the problem, led by then-former Secretary of Defense Donald Rumsfeld. The Commission to Assess the Ballistic Missile Threat to the United States, also known as the "Rumsfeld commission," formally presented its report to Congress in July 1998. The commission concluded that the ballistic missile threat against the U.S. was more significant and unpredictable than the Intelligence Community had been reporting, and that countries such as North Korea, Iran and Iraq could pose a threat within five years of making a decision to develop long range missiles. The commission unanimously recommended that "U.S. analyses, practices and policies that depend on expectations of extended warning of deployment be reviewed and, as appropriate, revised to reflect the reality of an environment in which there may be little or no warning."[20]

As if on cue, North Korea test launched a two-stage space launch vehicle on August 31, 1998. While that test was not entirely successful, it caught most of the Intelligence Community by surprise, and it demonstrated that the North Koreans had made much more progress than previously thought. Any country that can successfully demonstrate a space launch capability has the technical wherewithal to build a ballistic

missile with intercontinental range. The North Korean launch underscored the Commission's findings, and forced the Clinton administration to embark on a more serious program for strategic missile defense. The results of this work, by then known as "National Missile Defense," would ultimately be deployed during the George W. Bush administration.

President George W. Bush's administration took a much more proactive and preemptive approach to U.S. national security policy than President Clinton's. From a missile defense perspective, he felt that protecting the American people was an "obligation," and he worried about other nations having the ability to blackmail and intimidate the U.S., its friends and allies.[21] Many in his administration felt that the ABM treaty, which limited the U.S. to a site in North Dakota, was too much of a constraint. Previous analysis showed that a treaty-compliant missile defense site located in North Dakota would make it very difficult to defend the most distant states: Alaska and Hawaii. A site located in Alaska provided much better coverage of Alaska and Hawaii, as well as all of the continental United States; however, an Alaska site made defending the southeastern U.S. very difficult against any missiles launched from the Middle East.

There were also discussions early in the Bush administration on the right level of nuclear weapons needed to maintain deterrence, and what impact a national missile defense system might have on potential arms reductions. Presidents Bush and Putin discussed arms reductions and missile defenses, and in November 2001, they both announced unilateral reductions in strategic forces, but no agreement on missile defenses. Ultimately, President Bush decided to abrogate the ABM treaty, submitting the formal withdrawal to the Russian Federation on December 13, 2001. The ABM

Treaty formally ended on June 13, 2002, thus enabling the system to be constructed in Alaska and California.[22] On December 16, 2002, President Bush signed National Security Presidential Directive-23 (NSPD-23), which stated in part "…the dynamics of deterrence are different than in the Cold War when we sought to keep the Soviet Union from expanding outward," and he went on to direct "…the United States must make progress in fielding a new triad composed of long-range conventional and nuclear strike capabilities, missile defenses, and a robust industrial and research development infrastructure."[23]

The Bush administration envisioned a layered "system of systems" that could engage incoming missiles in all phases of flight. Known as the Ballistic Missile Defense System (BMDS), the Missile Defense Agency (formerly BMDO) planned land, sea and air-based defensive capabilities coupled to terrestrial and space-based sensors and connected by an integrated command and control system. Many of these systems were still in development and were unproven. The most mature of the systems was the Ground-Based Midcourse Defense (GMD), which was formerly known as National Missile Defense under the Clinton administration. Several radars were upgraded or constructed, and the GMD interceptors were installed at Fort Greely, Alaska and Vandenberg Air Force Base, California. The system went on alert in the summer of 2006, in response to multiple missile tests by North Korea that summer. The system remains in place and on alert for homeland defense; however, the Obama administration decided to cap the number of deployed interceptors at thirty; twenty-six at Fort Greely and four at Vandenberg.[24] This number is thought to be adequate to

counter a limited threat from Iran or North Korea without upsetting the strategic balance of deterrence with Russia and China.

Current Policy

Current U.S. policy treats missile defenses and strategic deterrence as separate but related issues; however, the two are closely linked within the context of regional or extended deterrence. Current policies on ballistic missile defense and strategic deterrence are congruent, thanks to both the Ballistic Missile Defense Review and the Nuclear Posture Review being conducted simultaneously in 2009-2010. In general, the current policy is to reduce the number of deployed nuclear weapons while maintaining a level sufficient to deter potential adversaries. At the same time, the policy requires maintaining the status quo on strategic missile defenses and greatly expanding missile defense deployments to counter the regional ballistic missile threat.

In similar fashion to the Clinton administration, the Obama administration has placed greater emphasis on regional/theater missile defense than on strategic defense. From a regional perspective, the U.S. is aggressively planning deployment of theater missile defenses to strengthen regional deterrence architectures, assure allies, and negate the coercive ability of regional actors to interfere with U.S. military access to the regions.[25] These systems are not effective against ICBMs, so they do not have a direct bearing on the strategic deterrence calculus vis-à-vis Russia and China; however, depending on where they are deployed, they can be a cause of concern for those two countries. In fact, current U.S. policy is to engage both Russia and China to assure them that U.S. missile defense capabilities will not adversely impact their strategic capabilities and interests.[26]

When the U.S. was planning a GMD interceptor site in Poland, Russia strongly objected, taking the position that U.S. interceptors in Poland were really intended to threaten the effectiveness of Russian ICBMs, not to counter a potential threat from Iran as the U.S. stated. In reality, the Russian position most likely had more to do with internal politics and their discomfort in having U.S. forces operating within what they consider their sphere of influence. Further, the Russians have far more ICBMs than the planned ten-interceptor site could have threatened, and the intercept geometry from a site in Poland is far from optimal since most engagements would result in a "tail chase."

More recently during the "New START" negotiations, Russia again attempted to directly link strategic missile defense with nuclear deterrence. Russian President Medvedev has stated publicly that Russia reserves the right to withdraw from the New START agreement if it feels U.S. missile defenses in Europe are creating an "imbalance." This linkage between missile defense and strategic offensive forces is addressed in the preamble of the agreement.[27]

China represents a different challenge than Russia, as China's strategy and doctrine are very opaque. China maintains a much smaller inventory of ICBMs than Russia, but the number could double within the next fifteen years, and China is aggressively pursuing more survivable ballistic missiles through the development of road-mobile and submarine-launched systems.[28] China has a very large inventory of shorter range missiles deployed to support potential operations against Taiwan. Their strategic forces are intended to deter U.S. intervention in the Taiwan Strait should China decide to reintegrate Taiwan by force. Additionally, China maintains its nuclear deterrent forces as a hedge against its regional competitors such as Russia and India.

Unlike Russia, China has never had a strategic arms treaty with the U.S.; however, the Obama administration has signaled that, at some point, the U.S. needs to engage China on nuclear weapons reductions. Given China's relatively modest level of strategic forces, a robust U.S. missile defense system could potentially threaten China's ability to deter the U.S. in a Taiwan conflict. This may be the reason China has begun developing survivable nuclear forces with increased numbers. China has also demonstrated an anti-satellite capability as well as a rudimentary ballistic missile defense capability and a robust cyber capability. Clearly, China is concerned with the asymmetric advantages the U.S. possesses in the event of a conflict with Taiwan, and it is moving aggressively to counter them.

The "end" of U.S. strategy for deterrence is to deter aggression and coercion against U.S. vital interests. The "ways" are to credibly threaten to impose costs and deny benefits to an adversary, and to encourage restraint. There are many "means" to do this; however, two of the key means are "Global Strike" and "Active and Passive Defense."[29]

Global strike includes all of the U.S. nuclear forces, and is the primary method within the deterrence strategy to credibly threaten an adversary. The threat is very easy to understand. If any nation attacks the United States with weapons of mass destruction, an immediate and overwhelming retaliatory strike on that country will result. These systems are kept on a high state of alert, are tested and exercised regularly, and have robust and survivable command and control architectures to maintain the credibility of the threat.

Ballistic missile defense systems fall within the active defense category, and are used to deny benefits to an adversary by defeating a limited ballistic missile attack. In this case, the benefit being denied is the damage caused by an adversary missile attack on U.S. soil. As with the global strike systems, missile defense systems are on constant alert and have demonstrated their effectiveness through testing.

Since the end of the Cold War, the U.S. and Russia have reduced operationally deployed strategic nuclear warheads by about 75 percent.[30] Yet, even with these sizeable reductions, both countries possess more than enough deployed warheads to effectively deter one another, as well as other nations. The goals of the New START agreement, if ratified, will further reduce these numbers to 1,550 accountable strategic warheads and 700 deployed strategic delivery vehicles for each country.[31] Employment of the current GMD system is meant to dissuade regional actors from developing ICBMs, deter them from using an ICBM if they develop the capability, and to defeat an ICBM attack against the homeland should deterrence fail.[32] Thus, under the current strategy, strategic missile defenses are not considered part of the U.S. efforts to deter Russia or China; rather, they are intended to deter other nations from building and using ICBMs against the U.S.

Arguments

Over the course of the debate on missile defenses, many arguments have been made, both for and against deploying these systems. Opponents consider them too expensive, ineffective and a threat to stability as they can undermine deterrence and cause arms races. There are also concerns that deployment of missile defenses by the U.S. will cause a deterioration of relations with Russia and China.[33] And clearly, missile

defenses cannot deter a non-rational actor or provide protection against the non-missile delivery of weapons of mass destruction (WMD).[34]

Most of these points represent valid arguments. Missile defenses are expensive, and the technical challenges which must be overcome are daunting, as the mixed results of missile defense tests have demonstrated. There is no evidence that the deployment of missile defenses has induced any country to build more missiles; however, it is generally believed that the development and employment of countermeasures on adversary missiles is the direct result of a desire to defeat missile defense systems.

As for stability and deterioration of relations, there is no compelling evidence either way, but recent statements by Russian leadership indicate that missile defense plans by the U.S. are certainly not favored by Russia. Lastly, missile defense systems can neither deter irrational actors nor provide protection against WMD attacks that are not delivered by missiles.

While critics of missile defense systems make valid arguments, so do the proponents. They argue that missile defense systems strengthen deterrence by introducing uncertainty into the calculus of an adversary by defeating the advantage gained by launching a first strike with ballistic missiles. They can limit the damage done if deterrence fails and there is a missile attack on the United States. Missile defenses are advantageous in a regional situation, adding to extended deterrence. This is especially relevant given the proliferation of ballistic missile technology as well as the robust testing program demonstrated by countries such as Iran and North Korea. The non-rational actor or rogue state threat also leads to an advantage, as missile defenses

can provide a hedge against the failure of deterrence. And lastly, missile defenses provide U.S. leadership with additional flexibility. They can choose to defend and then apply all elements of U.S. national power against the adversary vice simply responding with an immediate retaliatory attack. As with the opponent arguments, many of the proponent positions cannot be conclusively proven with evidence. There is no way to know for certain if a country did or did not do something solely because the U.S. deployed ballistic missile defenses.

Conclusions

Can strategic missile defenses and classical nuclear deterrence peacefully coexist? Provided they are carefully managed, the answer is "yes," and in fact, missile defenses can enhance some aspects of deterrence. Where deterrence loses effectiveness against actors seen as less deterrable, defense gains effectiveness.[35] The current policy of placing a priority on regional defense enhances security, assures allies, and strengthens extended deterrence. The danger, however, is in the unpredictability of potential adversaries. Policy decisions are, to some extent, based upon intelligence. If the intelligence is incorrect, in this case the estimation that countries such as Iran are years away from having an operational ICBM, then the current policy may be misguided.

The non-rational actor aspect must also be examined. When a ballistic missile is launched, the U.S. missile warning systems detect the launch location and azimuth very rapidly, providing U.S. leaders with a "return address" to the country that launched the missile. Knowing this, a rational actor would realize the U.S. is capable of launching a counter attack before an adversary missile strikes the homeland. With that in mind, a

rational actor will likely be deterred. Are the leaders of Iran and North Korea rational? If a transnational terrorist organization obtains ballistic missiles, do they care if the U.S. retaliates? The answers are subject to debate, but the existing missile defense system provides a hedge, just in case they are not rational and are thus undeterrable. Based on this analysis, it is prudent to maintain a missile defense system as a hedge, but if the system capabilities begin to impinge on Russia and China's perceived ability to deter the U.S., it creates another security dilemma, possibly leading to instability and another arms race. From this perspective, the existing policy of maintaining the status quo on the GMD system is prudent; moreover, as threats increase in the future, the system may have to be expanded. How far it can expand without threatening Russian or Chinese deterrence is subject to speculation.

Endnotes

[1] U.S. Congress, House of Representatives, Committee on Armed Forces, *Statement of General Kevin P. Chilton before the Subcommittee on Strategic Forces*, 16 Mar 2010, 1.

[2] Austin Long, *Deterrence from Cold War to Long War: Lessons from Six Decades of RAND Research* (Santa Monica: RAND Corporation, 2008), 7.

[3] Ibid., 10.

[4] Keith B. Payne, *The Great American Gamble: Deterrence Theory and Practice From the Cold War to the Twenty-First Century*, (Fairfax, VA: National Institute Press, 2008), 5.

[5] Ibid., 43.

[6] Ibid., 6.

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