

SPECIAL REPORT

U.S. National Security Strategy and the New Strategic Triad

The Independent Working Group on Missile Defense and the Space Relationship

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On a Capitol Hill Briefing

U.S. National Security Strategy and the New Strategic Triad

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FOREWORD

The Independent Working Group (IWG) on Missile Defense and the Space Relationship was formed in 2002 to provide a forum for informed discussion of missile defense needs. Our goals are several: (1) to examine the evolving threats to the United States, its overseas forces, allies, and coalition partners from the proliferation of ballistic missiles; (2) to address missile defense requirements in the twenty-first century security setting; (3) to assess current missile defense programs in light of technological opportunities in the post-ABM Treaty world; and (4) to set forth general and specific recommendations for a robust, multilayered missile defense (i.e., land, sea, and space) for the United States to meet the challenges of an emerging security setting that contains greater proliferation threats. The mission of the IWG is to educate policymakers, legislators, the media, and the American people on the need for a multilayered missile defense. Our goal is also to make missile defense as fully as possible a part of homeland security. In other words, our work cuts across national *and* domestic security and forms an indispensable part of U.S. national security strategy.

In pursuit of our objectives, the IWG meets several times a year. These meetings provide an opportunity not only to analyze issues directly related to missile defense, but also to identify other national security topics related to missile defense. The IWG is unique as an authoritative group that includes scientific-technical knowhow as well as public policy expertise working together to promote a greater understanding of missile defense in the policy community, on Capitol Hill, and at a broader public level. The IWG consists of a total of thirty members and project advisors (listed above). In addition, the IWG has eight sponsoring organizations.

The IWG has produced several publications, including major Reports summarizing present and emerging threats from states as well as terrorists, potential technological options and opportunities, the role of space, international collaboration, political and technical arguments that have shaped the debates about missile defense, the U.S. science and technology base, and a series of conclusions and recommendations. Other IWG publications include *A Layman's Guide to Missile Defense* and *Countering the EMP Threat: The Role of Missile Defense*. All can be accessed on the website of the Institute for Foreign Policy Analysis (IFPA), Inc. at <http://www.ifpa.org/research/researchPages/PostABM.php>.

In summary, the IWG brings together a distinguished and informed group of analysts to address key issues directly related to missile defense such as the Capitol Hill Briefing that forms the basis for this Special Report.

I. MEETING PURPOSE, SCOPE, AND OVERVIEW OF ISSUES

On April 20, 2012, the Capitol Hill Briefing on the topic of *U.S. National Security Strategy and the New Strategic Triad* was convened. Sponsored by the Independent Working Group (IWG) on Missile Defense and the Space Relationship and organized by the Institute for Foreign Policy Analysis (IFPA), the meeting was held at the Senate Visitors Center in Washington, D.C. Participants included Senate and House Staff members, officials from the Departments of Defense, State, and the military services, subject matter experts, representatives from industry, and IWG members.

In an opening presentation Dr. Robert L. Pfaltzgraff, Jr., IWG Co-Chairman and President of IFPA, set forth the purpose and scope of the meeting and provided an overview of the issues to be discussed. Our goal, he noted, is to explore the holistic relationship and synergies among the space domain, nuclear modernization, and missile defense, which together form the elements of a new Strategic Triad to support U.S. national security strategy and defense policy as well as broader U.S. diplomatic, political, and economic objectives. The meeting further sought to identify and discuss the missions of this new Strategic Triad, including deterrence, assurance, defense, and dissuasion.

Dr. Pfaltzgraff stated that the multidimensional threats confronting the United States necessitate development of a new Strategic Triad. The utilization of space and the ability to exercise space control is central to America's future as a global superpower given how the space domain has transformed the way the United States conducts military operations. For example, space and U.S. assets deployed there allow unprecedented advantages in national decision-making, military operations, and homeland defense by providing U.S. decision-makers with unfettered

global access to monitor strategic and military developments, achieve space situational awareness, space control, space superiority, and force enhancement and force application, as well as to support and exercise control over the U.S. nuclear arsenal and missile defense systems, the other two elements of the new Strategic Triad.

The U.S. nuclear arsenal consists of *Minuteman* land-based intercontinental ballistic missiles (ICBMs), *Trident* sea-launched ballistic missiles (SLBMs) deployed on submarines, and two types of nuclear-capable bomber aircraft, the B-52 and B-2. The United States, which produced its last new nuclear weapon in 1990 and ceased underground nuclear testing in 1992, has a nuclear modernization plan that envisions a new class of nuclear submarines and bombers together with updated nuclear bombs, warheads, and missiles. However, as discussed in greater detail in the next sections, the Obama Administration has scaled back funding for its promised modernization plan at the same time that it is considering additional (possibly unilateral) cuts in the nuclear arsenal beyond the 2010 New START reductions as well as advocating a world free of nuclear weapons.

In future crises the United States is increasingly likely to confront states in possession of both ballistic missiles and nuclear weapons. The United States has several programs for homeland defense and regional defense of allies and U.S. forces overseas (detailed in the next section). Currently, they are capable of intercepting ballistic missiles in only two of the three phases of a ballistic missile's flight trajectory, the midcourse and terminal phases. The optimum phase for interception is the boost-ascent phase prior to the release of warheads and decoys/countermeasures. The U.S. Navy and the Missile Defense Agency (MDA) are presently seeking to provide Standard Missile interceptors (part of the *Aegis Ashore* program described later) with

a capability called Early Intercept to destroy a missile prior to reaching its apogee.¹ However, it is a space-based missile defense architecture — such as an updated Brilliant Pebbles program (more below) — that would offer both the greatest capacity for boost-ascent phase intercepts² and global 24/7/365-operational availability. Consequently, the United States will need to field robust, integrated, multilayered missile defenses — ideally with a space-based interdiction component — that exceed the capabilities of current U.S. missile defense systems. In addition to multilayered defense architecture for homeland and regional missile defense, America also requires a modernized, precision, mission-versatile, nuclear arsenal, together with a range of space capabilities and their uninterrupted use.

These three components of the new Strategic Triad will provide the foundation for U.S. national security strategy and deterrence and support our major interests in an increasingly multinuclear world. For example, in the absence of the new, modernized Triad the ability to implement the January 2012 strategic

1 The boost phase begins immediately after launch while the ballistic missile is emitting exhaust gases that are relatively easy for sensors to detect and track. Next the ballistic missile enters the midcourse phase in space. It is during the midcourse phase that the warhead(s) and decoys/countermeasures are released. The terminal phase is very short beginning when the warhead(s) reenters the atmosphere descending to the target(s). Intercepting a warhead is difficult during this phase because there is little margin for error and the intercept occurs close to the intended target. The term “ascent phase” is sometimes used to describe the period immediately following boost phase. The ascent phase ends when the missile reaches its apogee or highest point prior to the discharge of warhead(s)/decoys. Early Intercept would occur during a ballistic missile’s ascent phase. Early Intercept allows assessment of the attempted intercept, and if unsuccessful, the launch of a second interceptor. This capability is called shoot-look-shoot.

2 A 21st-century Brilliant Pebbles would also offer the best capability for interception in the midcourse phase.

guidance for a U.S. reorientation toward China and the Western Pacific and to conduct military operations in this region is called into question. Several credible scenarios could draw the United States into conflict with China including a Taiwan-PRC crisis or a South China Sea territorial dispute between China and a U.S. ally such as the Philippines which escalates to include U.S. forces. In such scenarios U.S. power projection forces would confront growing Chinese anti-access/area-denial (A2/AD) assets including precision-guided weapons, ballistic missiles, anti-ship cruise missiles, submarines, advanced aircraft, and cyber weapons. In addition, China has developed and tested anti-satellite (ASAT) weapons that put U.S. space assets at risk. It has also attempted to jam U.S. military satellites.³

Similarly, an Iran with nuclear-weapons, combined with its extant A2/AD capabilities,⁴ would make any U.S. intervention scenario against Iran extremely complicated. The need to project power in this region was made more plausible in November 2011 when Tehran threatened to close the Strait of Hormuz after the United States imposed sanctions following revelations about Iran's nuclear program by the *International Atomic Energy Agency*. In response, the United States stated that it would use all necessary force to keep open the Strait of Hormuz through which approximately 20 percent of the world's oil is transported. The aftermath of a possible Israeli attack on Iran's nuclear facilities would also likely embroil the United States in a conflict with Iran.

³ In January 2007, China demonstrated the capability to attack satellites in low-earth orbit by successfully destroying one of its weather satellite using a direct-ascent, anti-satellite weapon. A year earlier China beamed a ground-based laser at U.S. military satellites orbiting over its territory. According to U.S. officials, however, the incident did not materially damage the satellite's ability to collect information.

⁴ Iran's anti-access, area-denial assets include ballistic and cruise missiles, sea-mines, and small swarm boats.

Moreover, confronting U.S. intervention, a nuclear Iran may be tempted to launch an electromagnetic pulse (EMP) attack in space (more on this threat in the next section) to destroy U.S. space assets thereby denying their use by American power projection forces.⁵ Such scenarios underscore the need to accelerate the Navy/MDA's aforementioned Early Intercept efforts and to develop a space-based missile defense system. It also means that space asset redundancy and the capability for speedy satellite replenishment must become key facets of U.S. space planning and requirements.

The development of the new Triad will necessitate an actionable, holistic planning process regarding each element of the Triad as well as broader security variables and considerations. Without an appreciation of how decisions concerning one element of the new Strategic Triad may bear on the other two elements as well as on wider national security strategy, policy, and technology/system development, such decisions will likely be taken without sufficient consideration of their actual impact on present policy, budget, technology options, and program choices. A fundamental requirement is for much closer coordination and collaboration among the multiple U.S. interagency stakeholders who assess the threat, develop national security strategy and policy, and conceive, develop, and acquire technologies and systems for each element of the new Strategic Triad.

⁵ In July 1962 the United States conducted a high-altitude nuclear test in space called Starfish Prime. The bomb was detonated at an altitude of 250 miles and the resultant EMP eventually destroyed one-third of all satellites in low-earth orbit. Today, the damage would have been much more devastating given the use of sensitive electronics in present day satellites together with the far greater number of assets currently in orbit. Radiation from EMP can also produce structural damage to non-electronic devices on satellites as well as degrade optical equipment and solar panels.

The Capitol Hill Briefing provided an initial opportunity to address these crucial issues by contributing to the understanding of the implications for current policy, budget, and program decisions as they relate to the new Strategic Triad. Key questions and challenges that must be addressed include what are the space requirements for nuclear modernization and missile defense as well as deterrence and counterproliferation? What are the requirements for nuclear modernization in light of the U.S. space program and missile defense? What should be the priorities for missile defense in light of the space program and nuclear modernization? How do decisions about the space program contribute to missile defense? What are the requirements for redundancy and replenishment, especially of U.S. space assets, if they are destroyed during military operations/conflict? What are the implications of decisions about any one of the elements of the Strategic Triad for other U.S. national security requirements? How can Triad stakeholders – e.g., the intelligence community, the National Reconnaissance Office (NRO), and DOD/the military services – collaborate more effectively? And, what is required in terms of the workforce, technological expertise, and infrastructure (including space launch capabilities) to develop and sustain the new Strategic Triad?

Several key priorities and recommendations for the new Triad emerged from the presentations. They are set forth and discussed in section IV of this Report. They include the following:

- Move Forward on a National Space Policy
- Leverage Space for National Security Purposes
- Reject the Draft European Union Code of Conduct for Space
- Re-Frame the Numbers Debate Regarding the U.S. Nuclear Arsenal

- Fully Fund START-Related Modernization Initiatives
- Highlight the Implications of Minimum Nuclear Force Standards
- Reinforce the Importance of Strategic Deterrence in Defense Planning
- Accelerate the U.S. Navy Aegis Missile Defense Program
- Build an East Coast Missile Defense Test Bed
- Counter the Electromagnetic Pulse (EMP) Threat
- Create a 21st-Century Brilliant Pebbles Space-based Missile Defense Program

II. PRESENTATION SUMMARIES ON THE NEW STRATEGIC TRIAD

Four panelists gave presentations on the U.S. space program, nuclear modernization, and missile defense priorities. What follows is an analytic summary that includes priority recommendations for each component of the new Strategic Triad.

Space. Dr. Robert Butterworth, former Chief for Strategic Planning, Policy, and Doctrine, U.S. Air Force Space Command and former staff member, the President’s Foreign Intelligence Advisory Board, noted the lack of a coherent, actionable national space policy for the United States. This is particularly troubling because nuclear modernization and missile defense form the indispensable basis for U.S. security in a multinuclear world with space and space systems providing the means to link the Triad components together. However, as a result of decisions taken during the 1990s “peace dividend” the investments and advances in space technologies and systems made during the era of the Strategic Defense Initiative (SDI) – most notably in the Brilliant Pebbles program (more below) – have been lost. As such, if the United States is to develop a comprehensive missile defense

system to respond to existing security threats, it will largely be starting from scratch unless it can reconstitute and modernize innovative SDI-related systems/technologies.

Dr. Butterworth emphasized that a comprehensive U.S. space strategy is necessary because space includes much of the cyber domain (an increasingly important aspect of U.S. national security and operations) and represents the high frontier for U.S. security. Despite this fact, there has been little serious thinking about what the United States requires from space and space assets and how it will leverage this domain in support of U.S. domestic and international interests. For example, current U.S. space planning neither identifies the mission essential space capabilities necessary to ensure the success of U.S. missions/operations nor sets forth a blueprint on how the United States develops, acquires and sustains those capabilities. In addition, it does not address the requirements for the redundancy and replenishment of vital space systems in the event of their destruction/degradation during military operations. It is alarming that the United States makes major investments in a range of space activities, systems, and operations without an informed overarching strategic approach connected coherently to future U.S. national security needs. This contrasts markedly from other major powers, most notably China, which is taking measured, well-conceived steps toward becoming a prominent space power.⁶

Dr. Butterworth noted that the United States must link space capabilities/activities more closely to the missions they are to

⁶ For example, on June 18, 2012, the three-person crew of the Chinese *Shenzhou-9* spacecraft successfully docked with the *Tiangong-1* spacelab in low-earth orbit becoming only the third nation after the United States and Russia to accomplish such a feat. Chinese space plans include a permanently manned space station by 2020 and establishment of a manned moon base in the second quarter of this century.

perform. Technology has made space an increasingly important domain for U.S. security, represented by the fact that each of the U.S. military services depend on space assets to conduct operations and missions in the land, air, and maritime domains. Such operations require effective deterrence, defense, and, if necessary, denial of adversarial uses of capabilities hostile to U.S. national security interests. Space capabilities – including the eventual deployment of space-based interceptors – are also essential to support a multilayered and integrated missile defense. Unfortunately, U.S. legacy space programs may not be relevant to future security requirements. While space systems have provided capabilities (e.g., through innovative engineering and software fixes) that were unanticipated when they were first developed, wishful thinking and luck do not constitute a sustainable path for an effective national strategy. U.S. planning for space must identify mission essential capabilities early on before embarking on system development and deployment which can take a decade or longer. Echoing a comment made by Dr. Pfaltzgraff at the outset, Dr. Butterworth stated that if denied the use of its space assets, the United States would face substantial difficulties in projecting power into regions of major strategic importance such as the Persian Gulf and the Asia-Pacific area.

Another issue impacting military operations is the fact that U.S. space systems have been designed primarily to satisfy the missions of the national intelligence community rather than those of the military.⁷ Dr. Butterworth stated this holds true even as the decisive military advantages resulting from the use of space systems for operations in *Desert Storm* and the more recent conflicts in Kosovo, Iraq, Afghanistan, and Libya have been made abundantly clear. From the very early days,

⁷ Robert L. Butterworth. “Space and the Joint Fight.” *Strategic Forum*. National Defense University: February 2012.

the missions of space-based surveillance and reconnaissance (S&R) have been the purview of the National Reconnaissance Office (NRO), a partnership between the Central Intelligence Agency and the Department of Defense. The NRO was created to develop, acquire, and operate U.S. spy satellites but its mission emphasized national intelligence programs (e.g., indications and warning of attack, foreign research and development efforts, weapons capabilities, and major force movements), not military operations/tactical S&R missions. While the intelligence and tactical military S&R worlds do collaborate, it is very difficult to field a single space system that meets the divergent operational needs of these two communities with their different core missions. Consequently, the United States should develop a separate tactical S&R space capability focused on military operations. Separate space architectures could also help provide redundancy in case of space system failure or interdiction during conflict.

Space has several vital roles to play in support of U.S. nuclear capabilities. Currently, space systems provide reconnaissance and surveillance of foreign nuclear test ranges such those as in North Korea and Iran, launch warning and tracking of ballistic missiles, detection of nuclear detonations, and damage assessment. Unfortunately, there are no official statements that address what actions/responses (nuclear or otherwise) the United States would take should deterrence fail. Dr. Butterworth explained that this leads to a lack of thinking on how best to leverage space in support of U.S. nuclear policy. However, in a crisis in which a nuclear weapon has been used a president may well wish that a greater number of space capabilities was available given that military operations will not stop with the initial use of a nuclear weapon. The desired capabilities include damage assessment, status of victims of the nuclear strike, and whether further attacks were in process or likely forthcoming. A president may

also want to take action against the aggressor while ascertaining the status of U.S and/or allied forces. Unfortunately, these capabilities are not being developed due to the lack of strategic thinking about the U.S. nuclear arsenal and modernization requirements.

Dr. Butterworth stated that the modernization of nuclear facilities, including the construction of the Chemistry and Metallurgy Research Replacement Nuclear Facility (CMRR-NF), has been deferred for at least five years. The purpose of the CMRR is to meet U.S. nuclear weapons stockpile requirements. It was to replace the current, five-decade old Chemistry and Metallurgy Research Facility at the Los Alamos National Laboratory responsible among other things for building plutonium pits which are the core of an implosion weapon that triggers detonation. As noted in a subsequent section, many in Congress are especially concerned by the administration's backtracking on the modernization of U.S. nuclear facilities.

Another key space issue is the avoidance of entanglements in international agreements. Such agreements could have the effect of significantly limiting U.S. freedom of action in space while allowing other nations (e.g., China and Russia) to circumvent the restrictions as it sees fit because the provisions of the accord cannot be adequately verified or monitored. The draft European Union (EU) Code of Conduct for Space is the latest effort to manufacture global norms that may be adhered to more steadfastly by the United States than by its competitors and adversaries. However, history has important lessons regarding space treaties and agreements. For example, the 1972 Anti-Ballistic Missile (ABM) treaty between the United States and Russia placed severe limitations on U.S. missile defenses for more than a generation. Even after U.S. withdrawal from the treaty in 2002, obstacles

within the Bush Administration continued to impede the development of missile defense systems.

History may repeat itself should the current administration continue to pursue the EU Code. A main goal of this Code is to create twenty-nine norms to govern space-based activities. The assumption of the Code is that entanglement of U.S. space capabilities and activities with those of other countries will provide the path to peaceful space operations. Such entanglement would not make United States more secure, however. The result would be limitations that impede U.S. space capabilities, including space-based missile defense systems, the testing of anti-satellite systems, and the collection of intelligence while allowing less scrupulous signatories to flaunt the largely unverifiable EU Code. Moreover, the United States already has policies in place that cover much of what is contained in the proposed EU Code. Dr. Butterworth concluded by noting that the EU Code would add an unnecessary and distracting layer of confusion and bureaucracy within the U.S. space policy community.

Nuclear Modernization. Dr. Keith Payne, Chairman, Strategic Command's Senior Advisory Group Policy Panel and Co-Chair, the U.S. Nuclear Strategy Forum, opened his presentation by noting how drastically the United States has already cut its nuclear stockpiles since the collapse of the Soviet Union. The arms control community continuously asserts that since the end of the Cold War the U.S. nuclear arsenal and infrastructure has been kept intact, remaining unaltered and untouched. The numbers, however, tell a different story. Since 1991 there has been an 85 percent reduction in the number of U.S. START-accountable strategic nuclear weapons, a 66 percent reduction in the number of launchers, and a 95 percent reduction in U.S. tactical nuclear weapons. Despite the common refrain that the United States has

not shifted from its Cold War orientation, it has clearly left the Cold War nuclear force posture far behind.

Dr. Payne went on to outline the contradictions and confused stances that the United States has taken on the U.S. nuclear arsenal in recent years. The most glaring contradiction is found in the 2010 Nuclear Posture Review (NPR)⁸ which calls for maintaining a strong deterrent while simultaneously promoting a reduced reliance on nuclear weapons. Dr. Payne noted that the administration appears to have reversed course on the modernization agenda to which it agreed at the time of the ratification of the New START Treaty in 2010 as a quid-pro-quo for Senate support. The commitment to a robust 10-year \$85 billion modernization program to ensure a safe, secure, and reliable nuclear arsenal had already begun to unravel soon after New START was ratified. This about-face demonstrates the wavering U.S. commitment to nuclear modernization. Reiterating a point made by Dr. Butterworth, Dr. Payne noted that, as is the case for space, there are no official security documents or posture statements that address how U.S. nuclear weapons fit or should fit into U.S. strategy. This creates a number of dilemmas for policymakers and makes it difficult to determine if further reductions in the nuclear stockpile are militarily acceptable.

The specific agreement for the nuclear modernization plan is set forth in Section 1251 of the classified FY2010 National Defense Act (NDA) committing the United States to a ten-year nuclear modernization program. Representative Mike Turner (OH), Chairman of the House Subcommittee on Strategic Forces, has indicated that proposed funding levels fail to meet Section 1251 targets. This shortfall is evident in the administration's

⁸ For the 2010 NPR see <http://www.defense.gov/npr/docs/2010%20nuclear%20posture%20review%20report.pdf>.

proposed FY2013 defense budget for the nuclear modernization program. For example, the Navy element – replacement of the Ohio-class nuclear-powered ballistic missile submarines (SSBN) on which *Trident* ballistic missiles are deployed – has been postponed by two years. Many of these submarines, which were first deployed in the 1980s and form one leg of the nuclear triad, are already approaching their original expected thirty-year service life.⁹ By delaying procurement of replacement Ohio-class SSBNs by two years the Navy will have only 10 such boats through most of the 2030s, two less than originally planned. This would put unnecessary long-term pressure on an aging fleet for the sake of short-term budgetary gains.

Moreover, the administration, after committing to a level of 1,550 operational nuclear weapons under New START, has initiated a new review of force levels with the goal of even further reductions (perhaps unilaterally). Some proposals, including a 2010 study by Air Force officials, suggest that the United States can meet its targeting requirements with a force as small as approximately 300 nuclear weapons. However, greater attention must be paid to the calculations that govern these potential reductions and what purpose they would serve as part of the overall U.S. strategic deterrent. The administration argues in the NPR that the additional cuts would set an example of U.S. leadership by promoting the global non-proliferation regime and advance its objective to move toward a nuclear-free world. Dr. Payne pointed out that these goals contradict over five decades of policies articulated by both Democratic and Republican administrations regarding the purpose the U.S. nuclear arsenal:

⁹ Ronald O'Rourke. "Navy Ohio Replacement (SSBN[X]) Ballistic Missile Submarine Program: Background and Issues for Congress." *Congressional Research Service*. Washington, DC. 5 April 2012. <http://www.fas.org/sgp/crs/weapons/R41129.pdf>.

- Deterrence of an attack on the United States;
- Extended deterrence to U.S. allies and friends;
- Assuring our allies of their security so they will not feel the need to acquire nuclear weapons of their own, and;
- Defense of the United States and our allies should deterrence fail.

Further reductions to U.S. nuclear forces would undermine these four goals. For example, additional cuts may actually encourage proliferation as other nations would have the incentive to acquire—or field a greater number of—nuclear weapons in order to move closer in parity with the U.S. nuclear arsenal and/or to neutralize U.S. advantages in conventional capabilities. Moreover, lower numbers would likely erode U.S. extended deterrence guarantees possibly prompting our allies to develop their own nuclear weapon capability. Finally, another round of nuclear reductions, particularly to something approaching the aforementioned 300-weapon option, may mean that United States would have to base deterrence on countervalue nuclear responses, i.e., the targeting of civilians, which would fly in the face of the Just War tradition that has acted as the moral compass of warfare for centuries. Two central components of this tradition, both of which could be compromised by minimum nuclear force standards, include distinction and proportionality. Distinction is based on the concept that combatants must be separated from non-combatants, and as such, non-combatants should not be targeted in times of war. Proportionality focuses on the expected benefits from a military attack. This principle is violated when the damage to civilians outweighs the anticipated gains from the strike. Moreover, Dr. Payne stated that a strategy of targeting civilians can be seen as lacking credibility meaning that the very foes the United States is attempting to deter may not take such a threat seriously.

To produce a deterrent effect, U.S. nuclear forces must have the following capabilities: sufficient size, flexibility, and resilience to adapt to changing security environments in order to deter over a wide variety of scenarios, discourage competitors, assure allies, avoid countervalue targeting strategies, and defend the United States and its allies should deterrence fail. Cut the nuclear force further and the United States will lose these capabilities. Instead, Dr. Payne believes the United States should focus on the reduction of Russia's non-strategic nuclear weapons (NSNW). Moscow, which holds a ten-to-one advantage in these systems, has increased its reliance on nuclear weapons in general and NSNWs in particular as part of its national security concept and military doctrine, a fact that alarms U.S. allies. There is also the concern about the safety and security of these systems and the possibility that some could be lost, stolen, or sold to another state or terrorist group, potentially to be utilized in an EMP attack against the United States.

Dr. Payne closed his presentation by noting that a review of the first half of the twentieth century shows what a world without nuclear weapons looked like. It is not the ideal world frequently portrayed by proponents of such a prospect. For example, during the first five non-nuclear decades of the twentieth century there were 100 million casualties over a ten-year period in two world wars. In sharp contrast, the Cold War ended without a world war that would probably have resulted in tens of millions of fatalities. The casualty figures from the non-nuclear first half of the twentieth century clearly should give pause to those who advocate ridding the world of nuclear weapons.

Missile Defense. Ambassador Henry Cooper, former Director, the Strategic Defense Initiative Organization and former Chief U.S. Negotiator, Geneva Defense and Space Talks, provided his assessment of the missile defense component of the new Strategic Triad. He noted that the SDI program initiated by the Reagan

Administration brought a range of advanced technologies to the point where the United States could have deployed an effective and robust space-based missile defense system by the late 1990s if it had the political will to do so. For example, Brilliant Pebbles (BP) was a fully approved program with realistic budget estimates to develop and deploy a 1,000-satellite constellation capable of firing high-velocity projectiles at ballistic missiles launched from anywhere in the world.¹⁰ The BP architecture was designed to engage and destroy as many as 200 nuclear warheads.

The Defense Department's Cost Analysis Improvement Group (CAIG) vetted the Brilliant Pebbles program and determined that the total cost of the system encompassing 1,000 BP satellites and 1,000 replacements would have been \$11 billion in 1990 dollars – or \$20.4 billion in 2012 dollars adjusted for inflation – over twenty-years of operation.¹¹ The estimated launch cost for each BP satellite was \$400,000 in 1989 and \$740,000 in 2012 inflation adjusted dollars for a constellation of 1,000 BPs, with replacement costs doubling those figures. Current advances in miniaturization to shrink the size and weight of components, sensors, and computers together with the innovative government-sponsored development of expendable space launch vehicles by the private sector¹² may help reduce the already low

¹⁰ *Independent Working Group Report on Missile Defense, the Space Relationship, & the Twenty-First Century*, 2009, especially pp. 27 – 31; <http://www.ifpa.org/pdf/IWG2009.pdf>

¹¹ Twenty-Year Cost estimate breakdown for Brilliant Pebbles in 1989 U.S. dollars and in 2012 U.S. dollars adjusted for inflation: RDT&E – \$7.35 billion and \$13.6 billion; Production of 2,000 BPs – \$850 million and \$1.57 billion; Launch Costs – \$800 million and \$1.48 billion; and Operating Costs – \$11 billion and \$20.4 billion.

¹² In late-May 2012 the Falcon 9 rocket, built by the SpaceX company under a contract with NASA, transported cargo to and from the international space station. Given its initial success, it is expected that SpaceX

launch price tag of the original BP program if the United States ever decided to proceed with a 21st-century version. Depending on the specific configuration and number of satellites deemed necessary for a 21st-century BP architecture, launch costs and overall life-cycle costs could drop even further.

In 1993 two contractor teams were working on a BP validation program and approximately \$300 million had been appropriated. Unfortunately, Brilliant Pebbles was cancelled by the Clinton Administration which effectively dispersed the entire BP development team as well as the technology itself. This happened despite the fact that Brilliant Pebbles was the only missile defense architecture that met the “Nitze Criteria,” i.e., the requirement that the cost of the missile defense would be less expensive than the offensive weapons deployed against it and that the cost of additional defenses would be lower than building more and better missiles by an enemy of the United States. Ultimately, it was as if the entire \$30 billion spent on missile defense between 1984 and 1993 had not been invested.

To make known how close the United States was to a moving ahead with Brilliant Pebbles and the rigor and integrity of that decision-making process, it was suggested that the official SDI documents regarding the decision to proceed with Brilliant Pebbles deployment should be made public and distributed to Members of Congress.¹³ Their promulgation would demonstrate the meticulousness of the BP vetting procedures, the strategic

vehicles will eventually ferry astronauts to the space station, a mission that since the retirement of the U.S. Space Shuttle is performed by the Russian *Soyuz* spacecraft. The dependence on Moscow for transporting U.S. astronauts is an example of shortcomings in America’s space planning process.

¹³ Mr. H. Baker Spring, F.M. Kirby Research Fellow in National Security Policy, The Heritage Foundation and IWG Member, is in the process of tracking down the SDI BP decision documents for dissemination.

rationale, technical feasibility, and costs that in the early 1990s made the development and deployment of a space-based missile defense system possible within less than a decade.

Dr. Cooper stated that there is currently sufficient support on Capitol Hill for both homeland and regional missile defenses, although as noted by the next speaker, the funding balance between the two missions may need adjustment. The primary system for homeland defense is the Groundbased Midcourse Defense (GMD) system with one site in California and Alaska. GMD is designed for limited protection of the United States against intermediate- and intercontinental range ballistic missiles (ICBMs). It consists of communications systems, fire control capabilities, and thirty ground-based exo-atmospheric interceptors capable of detecting, tracking and destroying (in the late-midcourse phase) ballistic missiles by utilizing multiple sensors including space-based assets. In addition, the Navy's sea-based missile defense (described below) can provide defense of the United States depending on where U.S. naval missile defense assets are deployed and/or their proximity to a ballistic missile's launch point. Navy missile defense could address the electromagnetic pulse (EMP) threat to the United States by attacks launched from ships off U.S. coasts (see below).

Regional missile defense programs against shorter range missiles have strong bipartisan support. They include: the *Patriot* Advanced Capability (PAC-3) capable against short-range missiles in the late-terminal phase; the Terminal High Altitude (THAAD) for intercepts in both the terminal and late-midcourse phase; and the European Phased Adaptive Approach consisting of deployments of the U.S. Navy *Aegis* missile defense ships in the Mediterranean Sea and the NATO *Aegis Ashore* program to counter the Iranian missile threat to Europe using land-based versions of the Standard Missile (SM) hit-to-kill interceptor and

the AN/SPY-1 radar.¹⁴ The United States also cooperates with several nations on missile defense including Japan on a Navy SM variant and Israel on the joint development of the *Arrow-3* which when deployed in 2014 will have the capability to intercept medium-range ballistic missiles – such as those currently in Iran’s arsenal – outside the earth’s atmosphere.

The U.S. Navy has twenty-four *Aegis* ships (five cruisers and nineteen destroyers) capable of missile-defense operations with plans for an additional ten ships by 2018. *Aegis* Standard Missile interceptors have an impressive interception test record – twenty-three successes out of twenty-eight attempts.¹⁵ Additionally, they have been tested against cruise missiles. Finally, tests have been conducted in the ascent and midcourse phases and out to a range of 3,700 kilometers. Early Intercept in the ascent phase is highly desirable because the threat missile is destroyed prior to release of warheads/decoys which if needed, allows for a second intercept attempt. Early Intercept also lessens the subsequent discrimination/intercept burden on midcourse and terminal defenses and offers the potential for reduced defense costs since fewer interceptors may be needed. These tests demonstrate the increasing reliability and capability of U.S. sea-based missile defenses.

Moreover, the Navy *Aegis* missile defense system affords great operational flexibility largely unencumbered by the legal,

¹⁴ SM-3 Block IB interceptors will be deployed in Romania (2015), the SM-3 Block IIA in Poland (2018), and the SM-3 Block IIB with Early Intercept capability will be available in the 2020 timeframe. See *Aegis Ashore Fact Sheet*, Missile Defense Agency, http://www.mda.mil/system/aegis_ashore.html.

¹⁵ See *Aegis Ballistic Missile Defense Testing Fact Sheet* at http://www.mda.mil/global/documents/pdf/aegis_tests.pdf. The latest successful SM intercept (#twenty-three) occurred on June 27, 2012 and is not listed on the Fact Sheet.

logistic, time, and cost issues and constraints associated with the deployment of land-based missile defense systems in foreign nations (or even by the many environmental and political obstacles attending a deployment within the United States). Apart from a potential future space-based system such as a 21st-century Brilliant Pebbles, no U.S. missile defense system possesses such deployment flexibility and range of missile defense capabilities and missions.

Because of these capabilities/flexibility Ambassador Cooper stated that several performance upgrades and modernization efforts should be sustained – and even accelerated – to make U.S. sea-based defenses even more effective. These include upgrades to existing and planned Standard Missiles to increase burn out velocities together with other *Aegis* enhancements that would heighten the capacity for Early Intercept and the interdiction of ICBMs. Robust funding for the SM-3 Block IIB multipurpose missile is particularly important because its lighter kill vehicle, flexible propulsion, and upgraded fire control software – in comparison with the Block IIA – will make Early Intercept possible. Slated for deployment in the 2020 timeframe as part of the aforementioned *Aegis Ashore* program, the SM-3 IIB will address medium- and intermediate-range threats and also augment existing GMD ground-based interceptors in Alaska and California to provide homeland defense against potential ICBM threats. The SM-3 family of interceptors, which could also be deployed in the United States to counter the EMP threat (discussed in greater detail below), are currently funded but might fall victim to Congressional sequestration.¹⁶

¹⁶ According to the Budget Control Act of 2011, the failure of the “Supercommittee” to find an additional \$1.2 trillion in deficit reduction means that Congress must sequester (i.e., cut) approximately \$500 billion in defense funding over the next ten years. Unless Congress overturns this provision, sequestration will occur in January 2013 which, when coupled

Another priority issue for missile defense is the threat posed by an electromagnetic pulse attack. EMP is generated by any nuclear weapon burst at altitudes above a few dozen kilometers: the higher the altitude the more widespread the effects. Ambassador Cooper noted that if an enemy were to detonate a nuclear weapon of any significant yield at an altitude of 100 miles over the center of the United States the resultant EMP would destroy electronic systems causing havoc on U.S. energy and telecommunications networks, transportation systems, banking, the movement of inventories, food processing and distribution capabilities, and other critical infrastructure dependent on electronics, propelling the nation back into a pre-industrial economy.¹⁷ This scenario represents the ultimate asymmetric attack against a nation such as the United States given its ever growing reliance on electronics to operate critical infrastructure nodes.

A number of states or even non-state actors could acquire a SCUD missile mated with a nuclear weapon in order to launch an EMP attack. For example, as early as the 1998 Rumsfeld Commission on the ballistic missile threat it was reported that Iran had tested a short-range ballistic missile in a trajectory that indicated the flight profile of an EMP strike. Moreover, intelligence analysts report the triggering of a device by Iran at an altitude capable of producing EMP effects. An EMP attack could be launched from a ship off U.S. coasts which would result in a warning timeline of five minutes or less. Furthermore, as noted earlier by Dr. Pfaltzgraff, in a U.S.-Iranian conflict an EMP strike

with the \$487 billion already cut, could result in Defense Department reductions approaching \$1 trillion over the coming decade.

¹⁷ See *Independent Working Group Report on Missile Defense, the Space Relationship, & the Twenty-First Century*, 2009, especially pp. 11 – 13; <http://www.ifpa.org/pdf/IWG2009.pdf>.

could be unleashed in space by a nuclear Iran to thwart the use of space assets by U.S. expeditionary forces. In addition, Iran has been cooperating with Venezuela regarding these technologies, making modern-day Cuban Missile Crisis scenarios plausible. Given the low threshold for acquisition of the capabilities to carry out such an attack and its resultant devastation, Ambassador Cooper called the EMP scenario an existential threat.

U.S. Navy *Aegis* missile defense ships deployed on our East and West coasts could defend against the EMP threat given their ability to intercept both short- and medium-range ballistic missiles in the midcourse phase. Currently, *Aegis* missile defense ships operating on the West Coast are regularly tested in the Pacific Missile Range Facility at Kauai, Hawaii. However, no comparable capability exists on the East Coast. Ambassador Cooper believes that an East Coast test range should be constructed because it would generate a valuable assurance/deterrent impact by demonstrating to both our allies and foes that the United States is capable of intercepting ballistic missiles fired at targets along the East Coast and foiling an EMP strike.

Ambassador Cooper stated that *Aegis Ashore*, the land-based component of the *Aegis* program for NATO Europe, should be deployed in U.S. military bases around the Florida Panhandle, in Corpus Christi, Pascagoula and elsewhere given the existing vulnerability to potential missile attacks originating from the Gulf of Mexico. The estimated cost to construct the single *Aegis Ashore* site in Romania and Poland is \$350 million plus an additional \$350 million for the SM interceptors/equipment and to comply with the numerous environmental and related regulations. Thus for less than \$1 billion per site *Aegis Ashore* could defend the U.S. homeland around the Gulf of Mexico against ballistic missiles and possible EMP attacks. A final piece of the U.S. coastal defense architecture is unmanned aerial vehicles (UAVs)

outfitted with advanced sensors and interceptors to detect and intercept ballistic missiles.¹⁸

III. A CAPITOL HILL PERSPECTIVE ON THE NEW STRATEGIC TRIAD

Dr. Rob Soofer, Strategic Forces Policy Advisor to Senator Jon Kyl (AZ), provided an analysis of the current debate in Congress on space policy, nuclear modernization, and missile defense. Reinforcing a point made earlier by Dr. Payne regarding the New START treaty, he began by highlighting the anger among many members of Congress over the administration's failure to live up to its agreements on nuclear modernization and refurbishment of nuclear laboratories, particularly the deferment of the Chemistry and Metallurgy Research Replacement Nuclear Facility at Los Alamos noted earlier, and the funding imbalance favoring regional missile defense programs versus homeland defense/GMD. Many of the Senators who ultimately signed on to ratification of New START did so believing that the administration would follow through on its proposed modernization plans. Dr. Soofer pointed out that the commitment to modernization lasted less than a year as funding was cutback in the administration's 2013 budget submission to Congress. Not only have the life extension programs for replacement warheads been delayed, but the administration also continues to reject the idea that the United States needs to develop and build any new nuclear weapons.

Also disturbing is the fact that in the next five years almost every scientist with experience in designing nuclear weapons will have retired from government service. If a future administration decides it is necessary to move forward with a new generation of

¹⁸ Robert L. Pfaltzgraff, Jr. and Henry Cooper, *White Paper: Countering the EMP Threat: The Role of Missile Defense*, The Institute for Foreign Policy Analysis, Cambridge, MA, 2010.

nuclear weapons as part of a strategic nuclear deterrent (e.g., an earth-penetrating capability to destroy reinforced and highly protected underground nuclear weapon facilities like those in Iran), it is unlikely that any scientists will be in the employ of the U.S. government with the requisite training and engineering know how to do so. Without continuing weapon design and related programs to help foster new scientists/engineers in these fields, the capability to originate and build new, safer, longer-lasting, and mission-versatile nuclear weapon technologies and systems would disappear. In essence, the United States is unilaterally disarming, voluntarily forfeiting the human and physical infrastructure necessary to design and build a new generation nuclear weapon if and when needed.

Dr. Soofer contended that the further reductions beyond New START-levels being contemplated by the administration would meet staunch opposition from Republicans in Congress. For example, Senators Bob Corker (TN) and Johnny Isakson (GA) have written to Senator John Kerry (MA), Chairman of the Senate Foreign Relations Committee, requesting oversight hearings to determine whether or not the administration is living up to its modernization obligations. Given the loss of faith among key Republicans about the administration's commitment, a new effort to reduce nuclear weapons below the 1,550-target set by New START would be "dead on arrival" in the Senate. A concern was raised that Executive Agreements can be (and have been) utilized to reduce or place restrictions on the U.S. nuclear arsenal, in essence circumventing the Senate's "Advice and Consent" role.

In the area of missile defense there is a growing divide between Republicans and the administration regarding the greater emphasis on regional defenses at the expense of homeland defense. For example, the administration plans to spend \$20 billion over the next five years on regional missile defenses

but only \$4 billion on homeland defense, primarily the GMD system in Alaska and California. Dr. Soofer noted that the Bush Administration had a much more balanced approach, recognizing the importance of defending both the homeland as well as our allies and forward deployed U.S. troops. Although the Obama Administration is supporting modest efforts to improve the performance and reliability of the GMD interceptors, there is no plan for significant upgrades/modernization even though GMD is slated to be in service until 2032 over which time the number and capability of ballistic missiles in the inventory of potential U.S. adversaries will continue to increase.

Under the previous administration, the plan was to develop and upgrade the GMD interceptor warhead with multiple kill vehicles. However, these plans have been abandoned by the current administration. The existing kill vehicle technology on the GMD interceptor is already ten years old. Without a new system, the United States will be using 30-year-old technology by 2032. GMD would be unable to keep pace with future threats such as the incorporation of multiple warheads (MIRVs) and sophisticated decoys/countermeasures on enemy ballistic missiles, as well as the increased numbers of ballistic missiles that will inevitably confront the United States. Such a situation, Dr. Soofer stated, would eventually make the GMD system ineffective against the evolving and accelerating threat and thus obsolete. If that occurs, Congress at some point would likely cancel the GMD program.

Another Congressional sore point regarding homeland defense is the administration's decision to place the sea-based X-band mobile radar¹⁹ on standby status in order to save

¹⁹ See Missile Defense Agency Fact Sheet at <http://www.mda.mil/global/documents/pdf/sbx.pdf>.

approximately \$500 million over five years. Several Republican lawmakers view this situation as another example of the administration's lack of commitment to homeland defense. Given that homeland defense is a major concern and that many in Congress believe that the administration has disproportionately emphasized regional missile defense at the expense of homeland defense, the GMD system needs to receive increased funding support particularly to upgrade the capabilities of the interceptor kill vehicle. Dr. Soofer also said that exploring the prospects of a reconstituted Brilliant Pebbles for homeland defense would also meet with support from several Members of Congress.

Dr. Soofer said that many unanswered questions remain should the administration win another four years in office. These include a possible effort to ratify the Comprehensive Test Ban Treaty (CTBT) as well as potential additional (unilateral) reductions in the nuclear arsenal. He suggested that an internal struggle exists within the administration between those who favor arms control and disarmament and the deterrence realists. This was made clear by the contradictions in the NPR that called for maintaining a reliable and effective nuclear deterrent while simultaneously moving toward a world free of nuclear weapons. Dr. Soofer concluded by saying that ultimately it must be the goal for anyone who supports a new Strategic Triad to ensure that the deterrence realists carry the day.

IV. KEY PRIORITIES AND RECOMMENDATIONS FOR THE NEW STRATEGIC TRIAD

Several key conclusions and recommendations emerged from the presentations and discussion. They are summarized below:

- *Move Forward on a National Space Policy.* A major priority in the space domain is the development, acquisition,

and sustainment of capabilities to support U.S. security objectives and to ensure the success of military operations. Currently, this priority is not explicit in the design of space systems. Present planning fails to identify what are the essential space capabilities and how they can be assured. This includes the requirements for space asset redundancy and timely replenishment which is particularly important given the possibility of EMP attacks in space, China's ASAT program, and the growing threat posed to U.S. space capabilities from cyber attacks. Furthermore, there is little analysis of the relationship between future space systems and other elements of force development and how their requirements may impact each other. Space system planning and overall force development planning must be integrated much more closely and coherently, not only within the Department of Defense, but also across the Interagency and the broader national security space enterprise.

- *Leverage Space for National Security Purposes.* The National Reconnaissance Office has crafted plans and policies and developed and operated space technologies/systems to enhance military operations, both conventional and nuclear. However, even with the enormous benefits that space assets provided in all U.S. military conflicts going back to *Desert Storm in 1991*, *priority has still been given to the missions of the U.S. intelligence community.* While the intelligence and tactical military worlds do collaborate, it is difficult to field a single space system that meets the differing mission needs of the two communities. Thus, the United States should develop a tactical space reconnaissance designed solely for military

operations. This approach would also help provide space system redundancy.

- *Reject the Draft European Union Code of Conduct for Space.* A final priority issue as it relates to space's role in this new Strategic Triad deals with future treaties and the evolution of international norms/laws. Arms control initiatives and treaties have profound implications for each of the legs of the Strategic Triad (e.g., the 1972 ABM treaty restrictions on U.S. missile defense). The United States should reject the European Union draft Code of Conduct that seeks to regulate space activities. The result would be limitations that impede U.S. space capabilities while allowing less trustworthy signatories to circumvent the largely unverifiable Code. The Code would also create a new layer of unneeded bureaucracy within the U.S. space community.
- *Re-Frame the Numbers Debate Regarding the U.S. Nuclear Arsenal.* The United States should make clear the dramatic reductions in the U.S. nuclear arsenal that have occurred since the end of the Cold War which includes an 85 percent reduction in the number strategic nuclear weapons, a 66 percent cut in launchers, and a 95 percent cut in tactical nuclear weapons. Setting the record straight is important because many in the arms control community assert that the U.S. nuclear arsenal and infrastructure has been kept intact, unchanged since 1991. It is also important because this fallacy may encourage further ill-advised reductions to our nuclear arsenal which erode its deterrent capability.
- *Fully Fund START-Related Modernization Initiatives.* Given the massive reductions that have occurred over the past

two decades, a priority issue is to move beyond nuclear force reductions and to focus on future nuclear requirements. The U.S. nuclear umbrella supports deterrence while strengthening alliance solidarity and reducing the need for allies to develop nuclear capabilities of their own. However, deterrence could fail which requires that the U.S. nuclear deterrent be reinforced with robust missile defenses as a major component. In order to bolster the capabilities of U.S. strategic nuclear forces: reverse the scaled-back procurement rate for the nuclear-capable F-35 aircraft because of their potential contribution to maintaining extended nuclear deterrence; continue to develop the Air Force's new bomber given the aging B-52H and B-2 fleets; undo the delay in the procurement of the Navy's Ohio Replacement Ballistic Missile Submarine program.

- *Highlight the Implications of Minimum Nuclear Force Standards.* The burden of proof is on those who claim that further nuclear force reductions would continue to provide adequate support for the deterrence capabilities that have sustained nuclear policy for over half a century. Given the uncertainty of future threats, it is nearly impossible to provide such proof. The stark reality of minimum force standards, such as those currently under consideration, is that they inevitably lead to deterrence strategies that hold large numbers of civilians and civilian targets at risk. This is immoral under the Just War tradition. In addition, the strategy of targeting civilians may not be viewed as credible by our adversaries and thus erode deterrence.
- *Reinforce the Importance of Strategic Deterrence in Defense Planning.* The main pillars of the U.S. nuclear deterrent in

the short and long term must be resiliency and flexibility. Without nuclear testing, the United States currently relies on Significant Findings Investigations (SFI) to test the safety and security of the U.S. nuclear arsenal. As noted by the Perry-Schlesinger Commission, the SFI process has historically been underfunded causing it to omit both flight tests and drop tests from its evaluation process.²⁰ Omitting such crucial metrics is a mistake that must be reversed if the United States is to maintain a credible and reliable deterrent nuclear capability. Modernization of nuclear warheads is a second area of concern that Congress must address. While funding for the Reliable Replacement Warhead (RRW) was scrapped in 2009, the Perry-Schlesinger Commission states that modernization is essential to the non-proliferation benefits derived from the extended deterrent. Modernization of our nuclear warheads can proceed in a way that supports current U.S. policy. The Commission recommendation that the Department of Energy's *National Nuclear Security Administration* should, on a case-by-case basis, determine the correct course for modernization of each of the warheads ranging from life extension through component redesign/replacement through full redesign is an acceptable path forward.²¹

- *Accelerate the U.S. Navy Aegis Missile Defense Program.* A critical short-term priority is to continue to improve the ballistic missile capabilities of the *Aegis* system through

²⁰ William J. Perry and James R. Schlesinger. "America's Strategic Posture: The Final Report on the Congressional Commission on the Strategic Posture of the United States." United States Institute of Peace Press: Washington, DC. 2009. p. 43.

²¹ Ibid. p. 42.

the upgrade and modification of the SM-3 missile, especially the IIB which will provide the capacity for Early Intercept in the ascent phase, coupled with a program that includes space sensors that allow for space cueing to enhance the *Aegis* system's global defense capability. Systems in low-earth orbit that can observe launches and provide information to interceptors wherever they are located form an important part of this architecture. It would complement ground, air, or sea-based sensors, which when linked would provide global coverage. The *Aegis* missile defense program and space cueing efforts need to be fully funded and kept on track if the United States is to prioritize missile defense and space as components of a new Strategic Triad.

- *Build an East Coast Missile Defense Test Bed.* A mid-term priority for missile defense is the development of a missile defense test range on the East Coast. There is deterrent value in demonstrating to current as well as potential future foes that the U.S. Navy has the capability to intercept ballistic missiles from a ship patrolling on our East Coast. However, to date all such testing has occurred on the West Coast test range, which leaves key vulnerabilities in our homeland defense. For example, GMD interceptors located on the West Coast would need to operate at their maximum capacity in a situation involving a long-range missile targeted at the East Coast.
- *Counter the Electromagnetic Pulse (EMP) Threat.* There is an undeniable, though less acknowledged, threat posed by shorter-range missiles launched from ships off our coasts and by EMP strikes directly in space to nullify the use of space assets for U.S. military operations and decision-making. In addition to nations that possess a

nuclear capability, non-state actors are capable of acquiring launchers such as a SCUD outfitted with a nuclear warhead. An EMP attack on the United States would devastate electronic systems on which it is increasingly dependent for energy, telecommunications networks, and distribution capabilities. To counter this threat the United States should station *Aegis* missile-defense capable ships on its East and West coasts, deploy the *Aegis Ashore* at various locations on land along the Gulf of Mexico, and develop unmanned aerial vehicles (UAVs) to detect and interdict ballistic missiles. The construction of an East Coast Test Bed (see above) would also help to address the EMP challenge.

- *Create a 21st-Century Brilliant Pebbles Missile Defense Program.* Another missile defense priority is the need for space-based missile defenses which would further weave together the three components of the new Strategic Triad. Therefore, the United States should initiate a streamlined development of a 21st-century Brilliant Pebbles program that builds on the original BP technologies and system concept. The program would incorporate advances realized since the early 1990s in interceptor/kill vehicle technologies, miniaturization of sensors, computers, and other critical devices that would reduce the size and weight of BP components and thus launch costs. Official SDI documents from the early 1990s regarding the decision to proceed with Brilliant Pebbles should be made public and distributed on Capitol Hill to underscore that the design, development, and deployment of a space-based missile defense system was painstakingly scrutinized and approved then, and is achievable today. Finally, a reconstituted BP system requires a space-based

missile defense test bed to test and integrate space interceptors, sensors, and command and control systems. A space test bed should be designed and developed within the next four to six years.

V. FUTURE IWG EVENTS

This Capitol Hill Briefing was an initial effort to understand more fully the strategic relationship among the space domain, nuclear modernization, and missile defense and its implications for ongoing policy, budget, and program decisions as well as overall U.S. national security strategy and policy. The IWG will facilitate a series of future Briefings/Workshops on the new Strategic Triad and related issues, organized for Members of the 112th Congress and their staffs, the 113th Congress to be elected in November 2012, and other select invitees in an effort to create a broader and deeper understanding of the synergistic, holistic relationship among the components of a new Strategic Triad.



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