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**NAVAL
POSTGRADUATE
SCHOOL**

MONTEREY, CALIFORNIA

THESIS

**THE MANNED PENETRATING BOMBER: TIME TO
RECONSIDER?**

by

Shawn E. Toenyas

June 2016

Thesis Co-Advisors:

Zachary Davis
James Russell

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THE MANNED PENETRATING BOMBER: TIME TO RECONSIDER?

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Submitted in partial fulfillment of the
requirements for the degree of

**MASTER OF ARTS IN SECURITY STUDIES
(DEFENSE DECISION-MAKING AND PLANNING)**

from the

**NAVAL POSTGRADUATE SCHOOL
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ABSTRACT

During the Cold War, the United States constructed a nuclear triad, which consists of three components: strategic bombers, intercontinental ballistic missiles (ICBMs), and submarine-launched ballistic missiles (SLBMs). The triad's mission was to ensure that the U.S. nuclear force would not be crippled or destroyed should an enemy attempt a first strike attack against the United States. This in turn offered a credible threat of a U.S.-launched second strike, enhancing the overall effectiveness of our deterrent strategy. This thesis challenges a central tenet of traditional U.S. nuclear doctrine by asking, "Is the Triad still needed?" Although some in the Air Force, along with various government personnel and those outside of the National Capital Region, have questioned the continued reliance on the bomber, there has been insufficient debate about either the bomber's deterrence value or second-strike launch capability in the event that nuclear deterrence collapses. This research examines the historic and contemporary reasons for maintaining bombers as part of the Triad. This thesis concludes that the strategic bomber should be removed from the Triad and the financial savings be redistributed to the remaining legs of the newly formed nuclear dyad.

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LIST OF ACRONYMS AND ABBREVIATIONS

AAF	Army Air Force
AMC	Air Materiel Command
BUR	Bottom Up Review
CALCM	Conventional Air Launched Cruise Missile
CBO	Congressional Budget Office
CONPLAN	Concept Plan
CRS	Congressional Research Service
DOD	Department of Defense
DOE	Department of Energy
GS	Global Strike
JFCC GS	Joint Functional Component Command for Global Strike
ICBM	intercontinental ballistic missile
LEP	Life Extension Program
LRS	Long Range Strike
NNSA	National Nuclear Security Association
NPR	Nuclear Posture Review
NSC	National Security Council
NPT	Nuclear Proliferation Treaty
NTI	Nuclear Threat Initiative
OMB	Office of Management and Budget
OPLAN	Operations Plan
QDR	Quadrennial Defense Review
REIN-IN	Reduce Expenditures in Nuclear Investments Now
RRWP	Reliable Replacement Warhead Program
SAC	Strategic Air Command
SANE	Smarter Approach to Nuclear Expenditures
SIGAR	Special Inspector General for Afghanistan Reconstruction
SLBM	submarine-launched ballistic missile
SRAM	short-range attack missile
SSBN	Sub-Surface Ballistic Nuclear

SSMP	Stockpile Stewardship and Management Plan
START	Strategic Arms Reduction Treaty
USSR	Union of Soviet Socialist Republics
USSTRATCOM	United States Strategic Command

I. INTRODUCTION

A. RESEARCH QUESTION

In the post-Cold War era, America is confronted by an evolving political backdrop that challenges our decision makers in how to best utilize our military capabilities to sustain our national interests. Nowhere are these questions more pertinent than in the role of nuclear weapons in U.S. security policy. The United States built a nuclear arsenal, made of traditional strategic bombers, intercontinental ballistic missiles (ICBMs), and submarine-launched ballistic missiles (SLBMs). If an enemy attempted a first strike attack against the U.S., the triad's mission would be to ensure that its nuclear force would not be crippled or destroyed. This action would ensure a credible threat of a second strike, which ultimately, would result in the increase of effectiveness of our deterrent.

This thesis addresses a central issue in U.S. nuclear strategy: Is the Triad still necessary? What role does each component of the Triad still play? There has been insufficient debate about whether or not the bomber has effectively deterred our enemies or our ability to use its capability in the launch of nuclear weapons in the event that nuclear deterrence collapses. The continuing need for nuclear-capable bombers should be questioned. A broader discussion is needed. This thesis is intended to contribute to that broader discussion. To examine this question, the thesis examines the history of the triad, its stated rationales that have evolved over time, with an assessment of the relevance of the triad to today's strategic environment. The thesis draws empirical evidence principally from U.S. government strategy documents and presidential statements and from secondary source documents that frame the arguments over different aspects of the triad. The thesis will specifically focus upon the manned bomber leg of the triad.

Soon after the collapse of the Soviet Union, the United States could recognize that the threat of a nuclear war had greatly diminished. The former super power adversary no longer posed a threat to its sovereignty. Due in large part to the Soviet collapse, the U.S. adjusted its nuclear deterrence posture by ceasing nuclear testing in 1992 and reducing its

stockpile of nuclear weapons. This new phase in U.S.-Russian relations could be characterized as an important signal to the world that the U.S. was prepared to reduce nuclear dangers by ensuring that the use of nuclear weapons would be relegated as a last resort. More recent statements on the U.S. side have gone further. In outlining the diminished role of nuclear weapons in the 2010 Nuclear Posture Report, President Barack Obama stated, “The United States will continue to strengthen conventional capabilities and reduce the role of nuclear weapons in deterring non-nuclear attacks, with the objective of making deterrence of nuclear attack on the United States or our allies and partners the sole purpose of U.S. nuclear weapons.”¹

During what proved to be a prolonged era of non-nuclear testing, arms control and seeming cooperation, the existing nuclear warhead stockpile shrank, stuck in a state of limbo with the purpose of providing the U.S. with a competent nuclear deterrence.

As the clock continues to tick, these remaining nuclear warheads and their associated-weapon delivery platforms age and break down. In order to ensure that these items remain in working order and ready to deploy effectively, certain preventative maintenance must be done to maintain their readiness. A big hurdle that stands in the way of the scientists and engineers at the National Laboratories, who are responsible for the upkeep of the weapons, is that some of the components on the warheads and their associated weapon platforms are deteriorating. Many pieces need to be remanufactured and replaced with new components and configurations, because the other pieces have become obsolete and are no longer manufactured. This aging process leads the Department of Energy and its labs to refurbish numerous obsolete parts. The dilemma for the nuclear stockpile is that retrofits using new replacement parts raise questions about the performance and reliability of the weapons.² Since the moratorium does not allow for nuclear testing, the labs must rely on computer simulations and experiments to determine whether or not the new pieces will perform at the standard required to deliver the weapon to its target. It is important to note that the moratorium on nuclear testing does not extend

¹ *Nuclear Posture Review Report*, April 2010, accessed February 28, 2014, <http://www.defense.gov/npr/docs/2010%20nuclear%20posture%20review%20report.pdf>.

² National Nuclear Security Administration, “Maintaining the Stockpile,” accessed December 3, 2015, <https://nnsa.energy.gov/ourmission/maintainingthestockpile>.

to being able to test the weapon delivery platform. However, the issue is whether the weapons delivery platforms will perform at the specifications required with the particular warheads associated with those systems. The concern is that refurbished parts are being introduced piecemeal so that the integrity of the complete systems and their associated warheads is increasingly questionable, especially in more challenging environments.³ The aging Cold War arsenal may not be fully serviceable in the modern political and technological context.

In addition to deteriorating and aging components, budget constraints have increased, thus putting limits on government spending for nuclear programs. On the surface it may appear that mentioning deteriorating components and delivery system is not related to whether or not the triad is still needed, but the aging nuclear stockpile that comprises the U.S. nuclear deterrent depends on defense dollars to maintain its relevancy. According to the NTI analysis of the Nuclear Weapons Budget, “The United States will spend at least \$179 billion over the nine fiscal years of 2010–2018 on its nuclear arsenal, averaging \$20 billion per year, with costs increasing from \$16 billion to \$25 billion per year over that timeframe.”⁴ Although to many the NTI budget overview appears to project adequate funding for the U.S. nuclear program, it primarily focuses on the direct cost associated with the nuclear weapons and its delivery systems, but does not account for maintaining the aging warheads and systems that will cause the budget to balloon to nearly \$500 billion in the next 20 years.⁵

Due to the budgeting of two global wars in Iraq and Afghanistan, as well as domestic downswings in the economy, lawmakers from both sides of the aisle have called for a sharp decrease in defense spending in order to attempt to bring the United States out of its fiscal doldrums. According to the Special Inspector General for Afghanistan

³ Ibid.

⁴ NTI, “U.S. Nuclear Weapons Budget: An Overview,” September 27, 2013, <http://www.nti.org/analysis/articles/us-nuclear-weapons-budget-overview/>.

⁵ Ibid.

Reconstruction (SIGAR), approximately 89 billion has been spent in Afghanistan.⁶ While according to Catherine Lutz, Watson Institute for International Studies, Brown University, approximately \$61 billion in U.S. funds has been sent to Iraq for purposes of reconstruction since 2003.⁷ Since billions of dollars continue to be pushed out to the warfighters on the ground in Iraq and Afghanistan, steps are being taken to rein in spending on a wide range of defense programs. It is becoming a bigger challenge to those responsible for maintaining the nuclear arsenal to justify their budgets and explain why it is necessary to continue to maintain, much less improve on the nuclear capability of the U.S. nuclear deterrent. According to a press release on 28 February 2014, Senator Edward J. Markey introduced, “the Smarter Approach to Nuclear Expenditures (SANE) Act, legislation that would cut \$100 billion over the next 10 years from the United States’ bloated nuclear weapons budget.”⁸ Congressman Earl Blumenauer (D-Ore.) introduced H.R. 4107, the Reduce Expenditures in Nuclear Investments Now (REIN-IN) Act in the House of Representatives. He was quoted as saying,

America faces a real choice: spend billions on nuclear weapons we no longer need or fund programs that educate our children and help find cures to deadly diseases. The security of our nation’s future will be ensured by investing in education not nuclear annihilation...We need to stop pouring billions into the nuclear weapons programs of the past and instead prioritize our nation’s pressing needs. The SANE Act will cut spending on outdated, wasteful nuclear weapons and related programs over the next ten years and will strengthen our long-term economic and national security.⁹

Although, this argument has some merit, it does not take into consideration the risks associated with an aging arsenal that continues to deteriorate a little each day. Over time it could compromise the integrity of the weapons if needed in a time of war. The

⁶ Joint Strategic Oversight Plan for Afghanistan FY13, accessed August 19, 2014, <http://www.sigar.mil/pdf/strategicoversightplans/fy-2013.pdf?SSR=2&SubSSR=15&WP=Strategic%20Oversight%20Plan>, 44–45.

⁷ Catherine Lutz, “Reconstructing Iraq: The Last Year and the Last Decade,” Watson Institute for International Studies, Brown University, March 8, 2013, accessed October 10, 2014, http://costsofwar.org/sites/default/files/articles/24/attachments/The_Last_Year1.pdf, 3.

⁸ Ed Markey, “Markey and Merkley Introduce Legislation to Cut Bloated Nuclear Weapons Budget,” February 28, 2014, accessed March 19, 2014, <http://www.markey.senate.gov/news/press-releases/markey-and-merkley-introduce-legislation-to-cut-bloated-nuclear-weapons-budget>.

⁹ Ibid.

weapons, once they are built, require periodic maintenance to ensure their safety and security, not to mention military viability. The good news is that effective nuclear deterrence can be achieved in many ways, all of which support a national commitment to ensure confidence at home and abroad that U.S. nuclear weapons remain safe and effective.

One option that should be considered is to shift from a triad to a dyad by not replacing some existing weapon types and thereby eliminate an entire class of weapons. According to the article entitled, “Triad, Dyad, Monad?” by Dr. Dana J. Johnson, Dr. Christopher J. Bowie, and Dr. Robert P. Haffa, a dyad is becoming unavoidable.,

We conclude that the U.S. Department of Defense should pursue an ICBM/SLBM Dyad as it moves to reshape its nuclear force posture at lower warhead levels. Essentially, the U.S. is already moving in this direction: the ICBMs and SLBMs remain robust, with modernization scheduled and funded, but the aging ALCM calls into question the value of the B-52 fleet, while the modernized but very small B-2 force is assuming a niche role. In short, the United States will soon field a de facto nuclear Dyad.¹⁰

With the focus being shifted to fiscal responsibility, perhaps the time has arrived that the United States remove the manned bombers from the nuclear triad and focus on the newly formed dyad to continue to promote nuclear deterrence.

B. IMPORTANCE OF THE ISSUE

When the United States unleashed the destructive power of the nuclear weapon on the cities Nagasaki and Hiroshima to end World War II, a new era was ushered in that would alter how countries approached war. To ensure that the United States remained superior in the development of nuclear weapons, billions of dollars were poured into research and development of nuclear technology. Over the years, the United States formulated what would become known as the “nuclear triad” consisting of the manned penetrating bomber, intercontinental ballistic missiles (ICBMs), and the submarine-launched ballistic missiles (SLBNs). For the last 50 years, it has been the ultimate

¹⁰ Dana J. Johnson, Christopher J. Bowie, and Robert P. Haffa, “Triad, Dyad, Monad? Shaping the U.S. Nuclear Force for the Future,” Washington, DC: Mitchell Institute for Airpower Studies. November 2009, <http://higherlogicdownload.s3.amazonaws.com/AFA/6379b747-7730-4f82-9b45-a1c80d6c8fdb/UploadedImages/Mitchell%20Publications/Triad%20Dyad%20Monad.pdf>.

guarantor of the United States and its allies against its enemies. Each leg has its own particular advantage and when combined together produces a nearly impervious force. Unfortunately, today's economic pressures place the national security of the United States in peril in a variety of unanticipated ways. Sequestration is forcing hard choices on defense planners. Removing one of the legs of the triad to reduce costs would enable us to maintain deterrence without jeopardizing the two remaining legs. As the Secretary of Defense stated in the 2012 Sustaining U.S. Global Leadership: Priorities for 21st Century Defense, "It is possible that our deterrence goals can be achieved with a smaller nuclear force, which would reduce the number of nuclear weapons in our inventory as well as their role in U.S. national security strategy."¹¹ Two dilemmas exist within that construct. 1) Which leg should be severed to ensure the survivability of the entire nuclear program? 2) Is there a way to keep them all but cut each to ensure the Triad's overall survivability?

The SLBMs are still virtually invulnerable and could retaliate even after a devastating attack on the United States. ICBMs are cost effective and can be launched quickly and accurately. The manned bombers can be used as a visual signal to adversaries and our allies that the United States can deploy nuclear weapons with global reach. The downside is that the manned bombers are slow and can take many hours to reach their targets. The argument can be made that although the manned bomber is slow, it does provide the visual deterrence necessary to make enemies think twice about initiating a nuclear war and to reassure U.S. allies that our extended deterrent "umbrella" can be activated without launching ballistic missiles. Without the ability to pull back the manned bomber, the United States would be left with only faster responses that may not be able to be pulled back if the crisis reversed course.

According to the December 2013 Congressional Budgeting Office's report entitled, "Projected Costs of U.S. Nuclear Forces, 2014 to 2023," "it will cost approximately \$24 billion to maintain the ICBMs and extend the life of the missiles,

¹¹ SECDEF, "Sustaining U.S. Global Leadership: Priorities for 21st Century Defense," 03 January 2012, accessed September 23, 2014, http://www.defense.gov/news/Defense_Strategic_Guidance.pdf.

while the SSBNs will need \$82 billion, and the bombers will cost \$40 billion.”¹² Although, the B-2 and B-52 will be in service for the foreseeable future, according to Michael A. Miller, “As the legacy bomber force begins phasing out of service (planned for some time in the mid-2020s through the 2040s), Congress may want to reevaluate Air Force acquisition plans for the LRS-B to ensure a sufficient backfill of U.S. long-range strike capabilities that meet the requirements of national security objectives.”¹³ The catch is that the Air Force, under the guise of nuclear deterrence, desires this aircraft to be used primarily for conventional missions; with the possibility of the aircraft being retroactively outfitted and utilized for a nuclear mission should one arise. In the current budgetary constraints landscape, lawmakers will take a closer look into these emerging weapons platforms. In the December 2008, Phase II: Review of the DOD Nuclear Mission, the Task Force on DOD Nuclear Management stated, “The weapons systems that compose the nuclear triad were built and designed decades ago. If the United States is to maintain a strong nuclear deterrent for the foreseeable future, a strategic roadmap for nuclear weapons systems and delivery platforms should be developed.”¹⁴ Although the Task Force found ongoing utility in maintaining the triad, DOD leaders and the Joint Chiefs of Staff continue to focus on conventional missions and forces versus nuclear capabilities for ongoing day-to-day military operations. Nuclear weapons have become a second or third tier issue for military leaders faced with ongoing conflicts, aging conventional capabilities, and downward budget pressures. In light of these factors, now may be the time to remove the manned bomber from the nuclear triad and shift the focus to extending the life of the current stockpile before spending cuts drastically reduce the effectiveness of the entire triad. It is better to sacrifice a leg of the triad today before the whole enterprise erodes to a point where it cannot be maintained piece by piece.

¹² Congressional Budget Office, “Projected Costs of U.S. Nuclear Forces, 2014 to 2023,” accessed September 10, 2014, <http://www.cbo.gov/sites/default/files/12-19-2013-NuclearForces.pdf>, 5.

¹³ Michael A. Miller, “U.S. Air Force Bomber Sustainment and Modernization: Background and Issues for Congress,” *Congressional Research Service*, April 23, 2013, 29.

¹⁴ Report of the Secretary of Defense Task Force on DOD Nuclear Weapons Management, “Phase II: Review of the DOD Nuclear Mission,” December 2008, accessed October 1, 2014, <http://www.defense.gov/npr/docs/DOD%20NW%20Management%20Phase%20II%20Schlesinger.pdf>, 31.

C. PROBLEMS AND HYPOTHESES

While maintaining the nuclear triad in its entirety would be desirable for U.S. national security, the continued degradation of an aging bomber fleet, coupled with an economic downswing places the entire triad in question. President Obama stated the role of nuclear weapons is important “as long as others possess them,” but their role is being diminished by efforts to move in the direction of “Nuclear Zero.”¹⁵ As he stated in his 2009 Prague Speech,

as the only nuclear power to have used a nuclear weapon, the United States has a moral responsibility to act. We cannot succeed in this endeavor alone, but we can lead it, we can start it. So today, I state clearly and with conviction America’s commitment to seek the peace and security of a world without nuclear weapons.¹⁶

The role of nuclear weapons has taken a backseat to conventional methods of deterrence and war fighting, leaving the notion of nuclear warfare as a lingering reminder of the Cold War. As U.S. military strategy focuses on conventional missions, the use of nuclear weapons as deterrence against ill-defined enemies is receiving new scrutiny. As stated in the 2010 Nuclear Posture Report,

Since the end of the Cold War, the strategic situation has changed in fundamental ways. With the advent of U.S. conventional military preeminence and continued improvements in U.S. missile defenses and capabilities to counter and mitigate the effects of CBW, the role of U.S. nuclear weapons in deterring non-nuclear attacks—conventional, biological, or chemical—has declined significantly. The United States will continue to reduce the role of nuclear weapons in deterring non-nuclear attacks. To that end, the United States is now prepared to strengthen its long-standing ‘negative security assurance’ by declaring that the United States will not use or threaten to use nuclear weapons against non-nuclear weapons states that are party to the NPT and in compliance with their nuclear non-proliferation obligations.¹⁷

¹⁵ The White House, Remarks by President Barack Obama, Prague, Czech Republic, April 5, 2009, http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered.

¹⁶ Ibid.

¹⁷ *Nuclear Posture Review Report*, viii.

Facing these difficult decisions, this thesis examines options for maintaining the U.S. nuclear enterprise at a reduced cost. The option of allowing the warheads and delivery systems to erode is fraught with hazards. While so-called life extension programs that remanufacture warheads and missiles with new components, can extend the viability of the existing arsenal, sooner or later it will be necessary to reconcile the aging warheads and proposed new delivery systems with the resources required to craft a new nuclear strategy for the new era. The decision facing decision-makers rests with whether or not retrofits using replacement parts are adequate to sustain the delivery systems and warheads necessary as a credible nuclear deterrent. At the heart of the issue is the emerging security environment in which nuclear powers such as Russia, China, India, Pakistan and others continue to invest and value nuclear weapons as part of their security strategy while the United States moves in the direction of disarmament. Although a decision to remove one of the legs of the triad would be controversial, especially for the Air Force, the Air Force would benefit by refocusing its efforts on a bomber fleet designed for vital conventional missions, including Global Strike. I argue that it is better to give up something now than to partially fund all three legs and risk the decline of U.S. capability to effectively deter nuclear attacks on U.S. soil and its allies.

D. EMERGING PERSPECTIVES ON THE ROLE OF NUCLEAR WEAPONS

While proponents of Global Zero have actively pressed their case for disarmament, a broader debate about the role of nuclear weapons in international security is emerging. On the other side of the debate stands Dr. Keith Payne, who states in his article entitled “Shooting Down Minimum Nuclear Deterrence,” in *The Washington Times*,

The danger of basing U.S. policies on such pretense has been amply demonstrated by the decade-long resurgence of Russian nuclear weapons, Russia’s intense hostility, explicit nuclear threats to U.S. allies, and manifest willingness to flagrantly violate arms-control limits as well as to change recognized territorial borders in Europe by force. Russia’s military campaigns against Georgia and Ukraine demonstrate Moscow’s driving ambition to restore the earlier Soviet sphere of power. The dangers of this Russian drive and the corresponding potential great value of U.S. nuclear

forces to help deter the escalation of crises are realities obvious to all but U.S. anti-nuclear activists.¹⁸

Along those same lines, in a paper entitled “Extended Deterrence and Strategic Stability in Northeast Asia,” Brad Roberts stated,

From a U.S. perspective, such efforts are not inconsistent with the effort to strengthen nonproliferation and make continued progress toward the ultimate goal of eliminating nuclear weapons. In fact, the very opposite is true: failure to ensure extended deterrence and strategic stability could seriously set back nonproliferation and disarmament efforts. Failure to ensure effective extended deterrence could encourage new proliferation by two types of states: (1) challengers to regional order, emboldened by the success of North Korea and Iran in negating U.S. extended deterrence and (2) U.S. allies, worried by the perceived ineffectiveness of U.S. extended deterrence.¹⁹

Within this broader debate, questions about the specific roles and ongoing importance of each leg of the triad have received inadequate attention. Thus, the debate so far has not addressed how we might maintain strategic deterrence with a dyad consisting of silo-based ICBMs and SLBMs.

As stipulated in the 2014 Quadrennial Defense Review, “The fundamental role of U.S. nuclear forces is to deter nuclear attack on the United States, as well as on our allies and partners...However, nuclear forces continue to play a limited, but critical role in the Nation’s strategy to address threats posed by states that possess nuclear weapons and states that are not in compliance with their nuclear nonproliferation obligations.”²⁰ The U.S. national military strategy depends on our ability to properly showcase a meaningful ability to deter our enemies from attacking. The U.S. accomplished nuclear deterrence by creating what is known as the nuclear triad, in which the component parts were designed to complement one another in the defense of the United States and its allies during the

¹⁸ Keith B. Payne, “Shooting down minimum nuclear deterrence,” *The Washington Times*, November 4, 2014, accessed August 25, 2014, <http://www.washingtontimes.com/news/2014/nov/4/payne-shooting-down-minimum-deterrence/#ixzz3S1akDH8D>.

¹⁹ Brad Roberts, “Extended Deterrence and Strategic Stability in Northeast Asia,” accessed August 20, 2014, <http://www.nids.go.jp/english/publication/visiting/pdf/01.pdf>, 2.

²⁰ *Quadrennial Defense Review*, March 4, 2014, http://www.defense.gov/pubs/2014_Quadrennial_Defense_Review.pdf.

Cold War. The legs of the triad operate independently. Together they complement each other in providing the United States and its allies with a credible deterrent that could survive any reasonable attack and still retaliate. We cannot know if the USSR or others might have been tempted to launch a disarming or decapitating first strike, but it could be surmised that U.S. deterrence succeeded in containing Soviet aggression, especially in Europe. It is important to remember that the primary objective was to deter, not actually to fight a nuclear war, and the manned bomber took its place as a primary means of deterrence.

The B-52 is a high-altitude nuclear penetrating bomber, equipped with short-range nuclear bombs and attack missiles. The B-52 was not only designed to be the cornerstone of the bomber force, but a huge asset in conventional missions. Over time the Air Force's perspective shifted from the B-52 to the B-2. Unfortunately, without much needed upgrades the aging bomber fleet will have to be replaced to sustain the triad concept. Without the procurement of the B-2 to replace the aging B-52, the flexibility and unique contributions of the penetrating manned bomber would have detracted from the United States' ability to field a diverse and survivable nuclear deterrence force. One of the focal points for maintaining the manned bomber as one of the legs is that it is the most flexible and visible force a nation can employ in a nuclear crisis. Its inability to reach a target in a speedy manner could be viewed as one of its greatest strengths as it provides both nations ample opportunity to contemplate the consequences. This would allow each nation's leader the ability to call off or reduce the scope of a retaliatory strike. Despite these longstanding rationales, I argue that in today's information age we can visually demonstrate a nation's resolve without lugging around an airplane that will take hours to arrive on target with a possibility of the aircraft being too late to perform its duty as an effective deterrent. Nuclear signaling via the bomber has been replaced by modern communications.

Although there exist advantages of maintaining and utilizing bomber technology, those advantages may not be sufficient to continue to pour national resources into maintaining and modernizing them in an era where financial resources are a scarce commodity. A variety of authors point out shortcomings of strategic bombers. Authors

Kingston, Sharp, and Bansak, in their article entitled “Pruning the Nuclear Triad? Pros and Cons of Bombers, Missiles, and Submarines,” stated, “Because bombers can carry both nuclear and conventional payloads, during a crisis an adversary might suspect that a conventionally-armed bomber was actually carrying nuclear weapons, thereby encouraging an attack against the bomber or a preemptive nuclear strike.”²¹ Additionally, they go on to state, “Instead of demonstrating resolve and deterring an adversary, scrambling bombers might actually exacerbate tension by rousing suspicion of an impending nuclear strike, thereby prompting further escalation.”²² Despite their benefits, manned strategic bombers can be perceived as liabilities.

Today the arguments have changed. Bombers are being converted to conventional mission status, creating the opportunity to move to a dyad consisting of SLBMs and ICBMs. Bombers are not currently on alert status and SSBNs need a minimum of four ships to be on alert status.²³ ICBMs, however, have the capacity of being 99 percent on weapons alert status. This ICBM alert status requires minimal manpower and provides the United States with a quick strike capability.²⁴ When combined with the SLBMs, a dyad provides adequate secure second strike capability and can still signal U.S. strategic intent. In her article entitled, “Triad, dyad, Monad?,” Dr. Dana Johnson believes, “although the U.S. would sacrifice some visual signaling of alert readiness changes, the ICBM and SLBM dyad option would offer most of the attributes of the current triad.”²⁵ Although, the use of a manned bomber provides the president with yet another option, a dyad provides the deterrence necessary to make our enemies reconsider an attack and our allies to feel secure under the nuclear umbrella afforded by the United States

²¹ Reif Kingston, Travis Sharp, and Kirk Bansak, “Pruning the Nuclear Triad? Pros and Cons of Bombers, Missiles, and Submarines,” The Center for Arms Control and Non-Proliferation, October 31, 2011, http://armscontrolcenter.org/issues/missiledefense/articles/120309_nuclear_triad_pros_cons/index.html.

²² Ibid.

²³ Federation of American Scientists, “U.S. Submarine Patrols Continue at Near Cold War Tempo,” accessed December 8, 2015, <http://fas.org/blogs/security/2009/03/usssbn/>.

²⁴ Johnson, “Triad, Dyad, Monad?”

²⁵ Ibid.

E. THE GROWING INFLUENCE OF FISCAL CONSTRAINTS

The aging B-52's life expectancy has its limits. The Air Force surmises that the survivability of the nuclear triad hinges on United States willingness to invest in the B-2 to ensure a transition between the B-1B and the B-52. Since each leg of the triad provides a unique and synergistic capability to the U.S. nuclear deterrence strategy, how persuasive is the argument for investing in a new bomber fleet? According to a Congressional Research Service report by Amy Woolf entitled "U.S. Strategic Nuclear Forces: Background, Developments, and Issues," she states,

The Air Force has indicated that a new bomber is essential to its future plans for the conventional long-range strike mission. It has stated that it is 'committed to modernizing bomber capacity and capabilities to support LRS (long range strike) military options.' It indicated that the new bomber 'must be able to penetrate the increasingly dense anti-access/area denial environments developing around the world.' The Air Force has, in the past, stated that this bomber will be designed to deliver nuclear weapons. However, in October 2011, the Chief of Staff of the Air Force indicated that the new bomber probably would not include nuclear capabilities initially, but would add them in as the B-2 and B-52 bombers retired from the fleet.²⁶

Continued modernization of the bomber fleet is a reality that needs to be addressed and its feasibility determined by those that control the money. In today's military landscape, deployed bombers have an increased conventional mission, which might suggest that now may be an appropriate to remove the bombers from the triad. Since costs are a driving force for all weapons systems, this momentum will move the United States toward a dyad. A report by the Mitchell Institute found the following:

Essentially, the U.S. is already moving in this direction: the ICBMs and SLBMs remain robust, with modernization scheduled and funded, but the aging ALCM calls into question the value of the B-52 fleet, while the modernized but very small B-2 force is assuming a niche role [conventional]...We believe a Dyad of modernized ICBMs and SLBMs will provide for strategic nuclear deterrence and stability in the years

²⁶ Amy F. Woolf, "U.S. Strategic Nuclear Forces: Background, Developments, and Issues," *Congressional Research Service*, RL33640, March 10, 2016, 37.

ahead, while allowing and encouraging needed investments in long-range conventional strike.²⁷

Fiscal pressures may be a growing factor in reshaping the triad. When policy makers take into account factors such as Life Extension Programs (LEP) for the warheads, the aging nuclear complex, replacement of entire delivery systems and the command and control systems needed to support them, the role of the manned bomber is like to come under increasing scrutiny.²⁸

F. WHO TO BELIEVE ON THE FUTURE OF THE TRIAD?

I use a combination of historic and current research to trace the history of the nuclear triad and the role of the manned penetrating bomber for nuclear deterrence. The research examines all the options for maintaining the deterrent force, including an assessment of options for adding more advanced warheads to replace aging technology. I use historical data and recent analysis on the costs of the existing arsenal and costs for developing new technology to replace Cold War era weapons. All of this, of course, suggests changes to nuclear strategy and operations, which in turn reflect broader national security objectives. How might the introduction of “new” nuclear weapon concepts or systems affect U.S. foreign policy? Would such new weapons evoke criticism, even if the overall role of nuclear weapons in U.S. strategy were to remain limited? Would the United States be driven primarily by fiscal constraints, even if it meant lopping off an entire leg of the triad? How would potential adversaries such as Russia view these changes? A thorough understanding of these issues is essential to better align nuclear weapon policies with U.S. strategic objectives.

G. THESIS OVERVIEW

Chapter I will be an introductory chapter that offers an overview of the issues addressed in the thesis. Chapter II reviews the history of the Nuclear Triad. It discusses innovation within the triad, current and historical military application, and future strategic

²⁷ Johnson, “Triad, Dyad, Monad?” 27–28.

²⁸ Arms Control Association, “U.S. Nuclear Modernization Programs,” December 2015, accessed January 10, 2016, <https://www.armscontrol.org/factsheets/USNuclearModernization>.

objectives within the realm of nuclear deterrence. Chapter III examines the Post-Cold War strategic bomber mission. The chapter will discuss budget pressures and tensions between the Department of Defense and Department of Energy. Chapter IV discusses the current state of nuclear deterrence doctrine and strategy. Chapter V concludes by summarizing the analysis and proposes ideas for the way ahead for effective yet efficient nuclear deterrence.

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II. HISTORY OF THE NUCLEAR TRIAD

A. NUCLEAR TRIAD BACKGROUND

After the two atomic bombs had been dropped on Nagasaki and Hiroshima to usher in the conclusion of World War II, the world officially entered into a new period that would be dominated by the rapid innovation of nuclear strategic systems. Of course, only a few countries possessed the financial, natural, and technological resources necessary to harness this newfound energy—the United States and its Manhattan Project partners (UK, Canada) and the Soviet Union. Thus began what would be known as the Cold War—a prolonged conflict that would pit two “superpowers” against one another in a race for world dominance. Although the United States had proven that this new energy was destructive, they in fact had taken the lead in advancing a competition in technology that would push the Soviet Union to pour its resources into matching the United States stride for stride for the development of new and more powerful nuclear weapons. The arms race was motivated by paranoia about the possibility of a “bolt from the blue” atomic attack on Soviet or American soil which pushed both sides to construct multiple weapons and delivery systems necessary to deter a first strike or mount a credible counterstrike. Thus, the emergence of what would be known, as the “nuclear triad” was born. This chapter will focus on the development of the three legs comprised of Intercontinental Ballistic Missiles (ICBMs), Submarine Launched Ballistic Missiles (SLBMs), and heavy bombers. According to Joint Publication 1–02, “By definition, deterrence is “the prevention of action by the existence of a credible threat of unacceptable counteraction and/or belief that the cost of action outweighs the perceived benefits.”²⁹ By explaining their individual importance and relevance in providing a nuclear deterrent against the Soviet Union, we can see how synergetic these systems ultimately became when utilized in tandem to ensure the credibility of nuclear deterrence.

²⁹ Joint Publication 1–02, Department of Defense Dictionary of Military and Associated Terms, 8 November 2010 (as amended through 15 January 2012), 96, [http:// www.dtic.mil /doctrine/ new pubs/ jp1 02.pdf](http://www.dtic.mil/doctrine/new_pubs/jp102.pdf). Government, U.S.; Defense (DOD), Department of; Military, U.S.; Air Force (USAF), U.S.; News, World Spaceflight (2013–09–19). Replacing America’s Aging Bomber Fleet (B-52, B-1, B-2): Long-Range Strike Bomber (LRS-B) Concepts, Ground Attack, Nuclear, Prompt Global Strike, Conventional ICBMs, Space-Based Systems, (Kindle Locations 337–339). Progressive Management. Kindle Edition.

As analyst Amy Woolf observed, “Since the early 1960s the United States has maintained a ‘triad’ of strategic nuclear delivery vehicles. The United States first developed these three types of nuclear delivery vehicles, in large part, because each of the military services wanted to play a role in the U.S. nuclear arsenal.”³⁰ In order to maintain relevance and to ensure that the budgetary dollar kept flowing to their particular branch, each branch of the U.S. military constantly needed to affirm its position as being indispensable when the nation is confronted with a crisis such as the Cold War. The development of a wide variety of delivery vehicles was the direct result of the broad span of tensions between the U.S. and the USSR following the end of World War II. These two colossal powers with profound economic and political differences set out on a potential collision course which increased the risk that they would eventually confront one another in another world war, this one involving the use of nuclear weapons. Each side quickly developed a nuclear deterrent that guaranteed that such a war would lead to total destruction of both societies as they sought to recover from World War II. During the Cold War, this ultimate paranoia never materialized, but the sheer numbers of nuclear weapons skyrocketed to the tens of thousands with no end in sight. As both countries struggled for dominance, the three legs of the nuclear triad continued to develop and modernize, shoring up perceived gaps in capabilities to ensure that Moscow would never contemplate a nuclear strike against the U.S. As reasonable as this strategy sounds on the surface, however, if one digs a few layers deeper, we can detect other reasons why each branch of the U.S. military craved a piece of the nuclear pie. Simply put, the Army, Navy, and the Air Force could not afford to forego the many benefits associated with the nuclear mission. By developing different delivery platforms that suited each division’s strengths, all three branches provided the President with suitable options to be employed in multiple scenarios, thus ensuring that the money and status continued to flow into their areas of responsibility.

Constant arguments about the nature and purpose of the strategic nuclear triad ensured that each branch of the military could invent a role for itself. Each leg of the triad

³⁰Amy F. Woolf, “U.S. Strategic Nuclear Forces: Background, Developments, and Issues,” *Congressional Research Service*, RL33640, May 15, 2014, 2.

represented another hurdle for Moscow to overcome if it planned on taking offensive actions against the United States and its allies. Each leg had a unique strength that could be seen as a compliment to the other legs, which allowed the United States to utilize multiple options. These options had the potential to persuade the Soviet leaders that provocations large or small could be met with devastating force. The value of guaranteed retaliation provided justification for redundant capabilities within the legs of the triad. According to author David S. McDonough,

a growing consensus gradually emerged that the sheer destructive power of these weapons made their use problematic in all but the most extreme situations. This may indeed have resulted in the much-celebrated ‘taboo’ over nuclear use that has persisted for over six decades. But the threat of using these strategic weapons, alongside the nuclear targeting and war planning that made this threat a reality, did become an integral part of American policy.³¹

B. THE HEAVY BOMBER

The first leg of the triad was the heavy bomber. According to official historical documents cited in *Replacing America’s Aging Bomber Fleet*, “as part of the U.S. nuclear deterrent during the Cold War, bombers were designed with the long ranges and heavy payloads needed to carry large nuclear weapons from bases in the continental United States to targets deep within the Soviet Union.”³²

In those early years, the early bomber could be categorized as simply “dumb bombers” because all they did was fly thousands of miles at high altitudes to drop their payload over a target. Of course, most would be in agreement of this assessment, but as time went on the weapons became more advanced and so did the method of delivery evolved to the point that these “dumb bombers” had the capability of being precision delivery systems.³³ Ultimately, according to the authors of *Replacing America’s Aging Bomber Fleet*, “The role of the bomber is to deter enemy attack upon our forces and those

³¹ David S. McDonough, *Nuclear Superiority: The ‘new triad’ and the evolution of nuclear strategy*, (New York: New York: Routledge, 2006), 13.

³² Government, U.S.; Defense (DOD), Department of, (Kindle Locations 1114–1116).

³³ *Ibid.*, (Kindle Location 700).

of our allies, and if required, to strike with sufficient precision and firepower to eviscerate the enemy's war fighting capability.”³⁴

From her book, *The Day We Lost the H-Bomb*, author Barbara Moran states, Lemay had done more than shape SAC up; he had created a religion. The gospel he preached was a simple parable: the schoolyard bully and the gentle giant. The Soviets were the schoolyard bullies, aiming to seize Europe, crush America, and spread communism throughout the world. SAC was the gentle giant, the muscle-bound kid who stuck up for the skinny geeks and pimply weaklings, the kid who didn't want to hurt anyone but could knock you out with one punch if he had to. The Strategic Air Command, and no one else, stood as America's shield and protector.³⁵

The sheer size of these aircrafts and the payload that could be transported to the target (or multiple targets) is staggering to comprehend. The main target of choice during the Cold War was Russia's industrial base. The nuclear mission of the heavy bomber relied upon comprehensive and deliberately planning with specific targets in mind, which were to be flown from a highly equipped home base.³⁶ American strategic bombers were on constant alert status, ready to launch bombers to their designated targets. To better understand the relevance of the heavy bomber, a look into its common characteristics such as range, payload, and flexibility will provide needed context. With equal relevancy, at the conclusion of World War II, Congress, the president, and even the Army all came to the same conclusion that the creation and use of the atomic bomb had enhanced the United States' status as a formidable airpower.³⁷ Thus, the Army blessed the AAF's departure from the Army's ranks and in September 1947, the U.S. Air Force became an independent service.³⁸ From the 1960s to present day, three bombers have stood the test of time in providing the United States with its conventional and nuclear mission: B-52, B-1, and the B-2.

³⁴ Ibid., (Kindle Locations 717–718).

³⁵ Barbara Moran, *The Day We Lost the H-Bomb*, (New York: Random House, 2009), 16–17.

³⁶ Government, U.S.; Defense (DOD), Department of, (Kindle Location 1177).

³⁷ Ibid., (Kindle Location 226).

³⁸ Ibid., (Kindle Location 4302).

1. B-52 Stratofortress

In his book, *Post-World War II Bombers*, author Marcelle S. Knaack stated, “At the conclusion of World War II, the Air Materiel Command (AMC) desired a new strategic bomber which would be capable of carrying out a strategic mission without utilizing bases controlled by other countries.”³⁹ Thus the birth of the B-52 came to pass. According to the B-52 factsheet, “The B-52 is capable of dropping or launching the widest array of weapons in the U.S. inventory. This includes gravity bombs, cluster bombs, precision guided missiles and joint direct attack munitions.”⁴⁰ In order for the United States to remain tactfully ready for an impending attack, “Beginning in 1958, nuclear-armed SAC B-52s flew ‘airborne alert’ to ensure the safety of a response team in the event that the U.S. was caught off guard by enemy attack,”⁴¹ as stated in an article by Jan Tegler. Due to its large frame and flexibility, its mission was changed from being a high altitude threat to a low penetrating bomber because of the invention of surface-to-air missiles. Although in its original design, no cruise missiles existed. Only after the cruise missile was developed that the B-52 went through a modification that would allow this missile to become a working payload for the aircraft.⁴² The B-52 was later re-designed to be a conventional/nuclear strike platform that could deliver the AGM-86C Conventional Air Launched Cruise Missile (CALCM), the AGM-142 Have Nap and the AGM-84D Harpoon anti-ship cruise missile.⁴³ This flexibility has allowed the B-52 to outlast its successors and still remain on active service. Although the United States Air Force (USAF) continues to work on the next generation of strategic bomber, it has continued refurbishing the B-52H to enable it to remain in service well into 2045. If the B-52H can be maintained for that length of time, it will have a remarkable service life of well over 90 years since its activation date.

³⁹ Marcelle S. Knaack, *Post-World War II Bombers*, Office of Air Force History, United States Air Force; First Edition (1988), 206–7.

⁴⁰ U.S. Air Force Fact Sheet, “B-52H STRATOFORTRESS,” accessed April 18, 2015, <http://www.minot.af.mil/library/factsheets/factsheet.asp?id=3724>.

⁴¹ Jan Tegler, “The 60-year history of the B-52 Stratofortress,” accessed September 26, 2015, <http://gearpatrol.com/2014/09/03/history-of-the-b-52-flying-fortress/>.

⁴² Government, U.S.; Defense (DOD), Department of, (Kindle Location 683).

⁴³ *Ibid.*, (Kindle Location 685).

2. B-1 Lancer

The B-1 was originally designed to replace the already aging and slow B-52, but ultimately did not inherit the nuclear mission.⁴⁴ From 1985 to 1997, the B-1B supported a nuclear mission with the capability of utilizing the AGM-69A nuclear short-range attack missile (SRAM), but the end of the Cold War hastened its conversion from a nuclear to conventional mission.⁴⁵ What happened? Arms control?

3. B-2 Spirit

As the last of the big three, the B-2 is both a conventional and nuclear weapons platform. According to the USAF's fact sheet,

Along with the B-52, the B-2 provides the penetrating flexibility and effectiveness inherent in manned bombers. Its low-observable, or "stealth," characteristics give it the unique ability to penetrate an enemy's most sophisticated defenses and threaten its most valued, and heavily defended, targets. Its capability to penetrate air defenses and threaten effective retaliation provides a strong, effective deterrent and combat force well into the 21st century.⁴⁶

In addition to its ability to utilize its stealth technology, it can fly up to 6,000 nautical miles unrefueled and 10,000 nautical miles with just one refueling.⁴⁷ This feature provides the B-2 the capability to fly to any point in the world within hours of launch. The B-2 should be considered a crucial component to the USAF heavy bomber fleet and in its ability to provide yet another piece of deterrence capability that must be respected. Even though in the early years the manned bomber was referred to as the 'dumb bomber' it provided the president with a formidable aerial attack that possessed the ability to carry enormous payloads. In addition, it presented the United States with a visible nuclear deterrent to our enemies, as well as, our allies and in case of attack could be launched at a prescribed target and retracted at a moment's notice. Although, it does not enjoy the

⁴⁴ U.S. Air Force Fact Sheet, "B-1B Lancer," accessed April 18, 2015, <http://www.af.mil/AboutUs/FactSheets/Display/tabid/224/Article/104500/b-1b-lancer.aspx>.

⁴⁵ AGM-69 Short Range Attack Missile [SRAM], accessed October 20, 2015, <http://fas.org/nuke/guide/usa/bomber/agm-69.htm>.

⁴⁶ The Official website of the United States Air Force, "B-2 Spirit," accessed August 30, 2014, <http://archive.today/20120716190351/http://www.af.mil/information/factsheets/factsheet.asp>.

⁴⁷ Ibid.

speed that the SLBM and ICBM does, its ability to take its time allots the United States and its enemies the time necessary to come to potentially reach a peaceful resolution. Like most aging technology that has been allowed to exist way past its viability, the manned bomber's dire need to be replaced by a new fleet of long range strategic bombers brings along its share of controversy. One of main arguments lies with understanding the reasoning to pour billions of dollars into a new long-range strategic bomber when the majority of missions revolve around conventional means versus nuclear means. Although, the president relies on the ability to utilize multiple options during a crisis, it makes little sense to spend billions of dollars within the nuclear budget on a resource with a conventional mission.

4. The Imaginary Bomber Gap

In the early years of the arms race between the United States and the Soviet Union, there came to be a belief that the Soviet Union was outpacing the United States in the manufacturing of strategic bombers.⁴⁸ This belief helped to bolster the U.S. military's argument that in order to keep pace with the Soviets, the United States would need to increase defense spending and undertake a massive buildup of the Air Force's bomber fleet.⁴⁹ The continuing assurance of the Soviet buildup was compounded by a report by the President's Air Policy Commission, which stated,

But there is a new element through which this country may be attacked the air. And the new weapons which can be delivered through the air make it vital that we protect ourselves from attack by way of this new element. An air attack could be so terrible that we must at once create the best conceivable defense against it. This means an air force in being, strong, well equipped and modern, not only capable of meeting the attack when it comes but, even more important, capable of dealing a crushing counteroffensive blow on the aggressor.⁵⁰

⁴⁸ Michael Krepon, "The Bomber Gap," *Arms Control Wonk*, April 30, 2012, accessed November 10, 2015, <http://www.armscontrolwonk.com/archive/403428/the-bomber-gap/>.

⁴⁹ A Report by the President's Air Policy Commission, "Survival in the Air Age," Washington, January 1, 1948, accessed August 15, 2014, http://www.archive.org/stream/survivalinairage00unitrich/survivalinairage00unitrich_djvu.txt, Section I.

⁵⁰ *Ibid.*, 11–12.

The Commission believed that with the continuing advancement of the heavy bomber, the United States would no longer enjoy the benefit of being so geographically removed from the land of their enemies that they could not reasonably be attacked. As the Air Policy Commission continued, “The strategy to meet these new conditions is obviously that which we have described above to have in peacetime a force in being which will protect to the greatest extent possible our air space as well as our water approaches and hold out to anyone who thinks of attacking us the prospect of a counterattack of the utmost violence.”⁵¹ The Commission pressed the administration to press forward with aerodynamic research and development, as well as, electronics and related areas, which result in the most advanced and effective aircraft and missiles. The result of this new aircraft and missiles would be the protection of the United States and its citizens from the Soviet Union. From 1950–1953, this endeavor would see the reserve Air Force increase its force to an estimated 8,100 new planes. In the end, the Commission was adamant that a new fleet of bombers was required to put the rest of the world on notice that if an attack on U.S. soil was done, then a swift and counterstrike would level its cities, factories, and crush its war machine.⁵²

C. INTERCONTINENTAL BALLISTIC MISSILE (ICBM)

The U.S. ballistic missile program would be non-existent without the aid of Wernher von Braun and Hermann Oberth, which was stated so eloquently by T.D. Dungan, “Along with thousands of other engineers and scientists, they produced one of the most infamous weapons of the Second World War: the V-2 rocket.”⁵³ In addition to the creation the V-2 rocket a simple fallacy of its effectiveness was revealed by Dungan in his book entitled, *V-2: A Combat History of the First Ballistic Missile*,

The ancestor of all Cold War and modern day ballistic missiles, as well as the rockets used for space exploration, the V-2 could not win the war for Germany—it was too expensive, too complicated, too inaccurate, and its warhead was too small—but its unprecedented invulnerability and

⁵¹ Ibid., 12.

⁵² Ibid., 12–26.

⁵³ Tracy Dwayne Dungan, *V-2: A Combat History of the First Ballistic Missile*, (Yardley, PA: Westholme Publishing, 2005), 11.

influence on Allied planning made the V-2 and the advancements it represented the ultimate war prize, and British, American, and Soviet forces scrambled to seize German rocket technology along with its scientists and engineers.⁵⁴

At the close of the Second World War, the Americans and Soviets scrambled to acquire as much information and technology as possible in order to design their own ballistic missile. By the end of the 1950s, the U.S. and Soviet missile programs had achieved the ability to go intercontinental, thus establishing their ballistic missile as a formidable strategic weapon.⁵⁵

Although the bomber fleet was the technology of its time, it was too slow to deploy, which is probably a main reason that a new method of defense needed to be developed that would be better, faster, and less costly solution in the case of an extreme emergency. Early ICBMs had limited accuracy that allowed them to be used only against large targets such as cities. During the 1950s, certain developments occurred which led to the creation of the ICBM. According to historic background collected by the website Atom Central:

Three developments in the mid-1950s, however, led to the intercontinental ballistic missile (ICBM): (1) the development of the thermonuclear bomb with a much greater destructive power than the original atomic bomb; (2) the rapid refinement of inertial guidance systems for ballistic missiles; and (3) the development of powerful booster engines for multistage rockets, greatly increasing their size and range.⁵⁶

Due to these technological advances, the ICBM became a lethal force with the capability of flying up to 3,410 nautical miles and destroying its target with pinpoint accuracy.⁵⁷ Because of the arms race between the Soviets and the United States, ICBMs became a symbol of the nuclear deterrence strategy since each of them had a specific Soviet target programmed and did not require a crew to fly it to its destination. Today,

⁵⁴ Ibid., 10.

⁵⁵ Peter Roman, *Eisenhower and the Missile Gap*, (Cornell, NY: Cornell University Press, 1995).

⁵⁶ Atom Central, "Intercontinental Ballistic Missiles," accessed August 24, 2014, <http://www.atomcentral.com/icbm-missiles.aspx>.

⁵⁷ The Center for Arms Control and Non-Proliferation, "Fact Sheet: U.S. Ballistic Missile Defense," accessed November 26, 2015, <http://armscontrolcenter.org/fact-sheet-u-s-ballistic-missile-defense/>.

only a handful of nations have working ICBM technology.⁵⁸ Multiple other countries are rumored to desire ICBM technology or are actively working on constructing their own ballistic missile. But the ICBM still possesses symbolic value for the ability to reach across the world with strategic weapons.

1. Missile Gap

A few years later after the unfounded bomber gap was influencing defense spending, along came its evil twin, the Missile gap, which led Americans to believe the Soviet Union possessed a superior number of nuclear missiles in their inventory over that of the United States. The situation was further exasperated when Nikita Khrushchev strongly proclaimed that the Soviet Union was churning out ICBMs “like sausages,” which as it turned out to be false propaganda aimed at potentially instilling fear and anxiety throughout the United States.⁵⁹

2. U-2 Incident

In order for the United States to fully comprehend the technological advancement of the Soviet Union’s ICBM production, President Dwight D. Eisenhower sanctioned flying U-2 aircraft over Soviet bases to gather aerial photography over four Soviet top secret military objects. In the unfortunate likelihood that the U-2 would be shot down, President Eisenhower desired that British pilots fly the plane; because if an American pilot was captured it could spark an international incident and potentially cause war between the Soviets and the Americans. Initially, the plan went off without a hitch with the first two missions flown by the British; then President Eisenhower allowed U.S. pilots to fly the final two missions. On 9 April 1960, a U-2 spy plane piloted by CIA pilot Francis Gary Powers was hit by a surface-to-air missile and crashed into the Soviet Union. Initially, the United States provided a cover story that the plane went missing; in fact, the pilot survived and was being held by the Soviets for questioning. Khrushchev

⁵⁸ Missiles of the World at Missile Threat, accessed July 10, 2015, <http://missilethreat.com/missiles-of-the-world/>.

⁵⁹ Greg Thielmann, “The Missile Gap Myth and Its Progeny, *Arms Control Today*, accessed November 15, 2015, https://www.armscontrol.org/act/2011_05/Thielmann.

provided President Eisenhower an opportunity to come clean about the situation by telling him that they had recovered the plane. He left out the most important detail, which was the pilot was alive and well and was singing like a bird about his mission. In the end, President Eisenhower took responsibility for the covert mission.⁶⁰

3. Sputnik 1

The proclamations by the Soviets about their technological superiority as evidenced by their ICBMs were gained credibility with the launching of Sputnik 1 on 4 October 1957. Although, this launch raised concerns between the public and politicians alike, President Dwight Eisenhower seemed unimpressed and unsurprised over the event.⁶¹ Unfortunately, the president's reaction to the launch received negative reviews from the general public. On a comical side note, the whole idea of a missile gap was parodied in the 1964 film *Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb*, in which John Pilger stated, “‘the missile gap’ was the false flag. In order to build more and bigger nuclear weapons and pursue an undeclared policy of domination, President John Kennedy approved the CIA’s propaganda that the Soviet Union was well ahead of the U.S. in the production of Intercontinental Ballistic Missiles. This filled front pages as the ‘Russian threat.’”⁶² With the launching of Sputnik I, there is little doubt that it had a profound impact on triggering the space race and the arms race.

D. SUBMARINE LAUNCHED BALLISTIC MISSILE (SLBM)

If not for the creative genius of the Germans and their desire for retaliation against the allies, perhaps the notion of launching a ballistic missile from a submarine would not have come to fruition. While the Germans were in the midst of attempting to perfect their V-2 ballistic missile, a submarine-towed launch platform was being engineered to

⁶⁰ Dino A. Brugioni and Doris G. Taylor, *Eyes in the Sky: Eisenhower, the CIA, and Cold War Aerial Espionage* (Annapolis, MD: Naval Institute Press, 2010), 343–46.

⁶¹ Robert A. Divine, “The Sputnik Challenge: Eisenhower’s Response to the Soviet Satellite,” *Foreign Affairs*, (1993), accessed December 2, 2015, <https://www.foreignaffairs.com/reviews/capsule-review/1993-06-01/sputnik-challenge-eisenhowers-response-soviet-satellite>.

⁶² John Pilger, “The Strangelove effect – or how we are hoodwinked into accepting a new world war,” 18 April 2014, accessed August 2, 2015, <http://johnpilger.com/articles/the-strangelove-effect-or-how-we-are-hoodwinked-into-accepting-a-new-world-war>.

prototype the first submarine-launched ballistic missile. The Germans named this project codename *Prüfstand XII* (“Test stand XII”), or commonly referred to as the rocket U-boat. Hitler’s hope during the end of World War II was to perfect this technology and sail his U-boats to the United States undetected and fire these ballistic missiles on the United States. Although, the damage would be minimal at best, it would demonstrate to the United States and the allies that the Germans possessed weapon’s technology vastly superior to what was currently in their arsenal. Unfortunately, due to the extensive cost associated with the program and the eventual defeat of the Germans, the missile program was quickly picked over by the United States and the Soviet Unions for the advancement of their missile program.⁶³

Of the three legs of the nuclear triad, the SLBMs would be considered the most survivable due to its ability to be stowed away on ultra-quiet submarines that have the capability of hiding from reconnaissance satellites and possessing the ability to fire nuclear weapons on a whim.⁶⁴ Since SLBMs are collocated on a submarine, it makes them impervious to a first strike attack, which in turn garners them the ability to maintain the capability of launching a devastating retaliatory strike. During the Cold War, Russia and the United States were aided by engineers that assisted Germany in the first design of a submarine launched missile design.⁶⁵ Of course, with the eventual end of the Cold War, multiple nuclear players have placed their hat into the SLBM arena to include: Great Britain, France, China, and India. As mentioned, SLBMs have a greater survival rate and the ability to initiate a first or counter strike without warning, which makes this leg a vital component to the success of the United States’ strategic nuclear deterrence strategy. Although, constant discussion centers on reducing nuclear delivery systems and stockpiles, it is a safe bet that the SLBM force is destined to remain the centerpiece of deterrence in the United States for the foreseeable future.

⁶³ Arnie Jacobsen, *Operation Paperclip: The Secret Intelligence Program to Bring Nazi Scientists to America*, (New York, NY: Little, Brown and Company, 2014).

⁶⁴ Johnson, “Triad, Dyad, Monad?”, 9.

⁶⁵ Federation of American Scientists, “SSBN Early Developments,” accessed October 12, 2015, http://fas.org/nuke/guide/usa/slbn/ssbn_early.htm.

With the established roles of all three legs of the nuclear triad, each brings unique contributions in maintaining an effective nuclear deterrent. The heavy bombers were utilized beginning with the destruction of two Japanese cities, ultimately ending World War II, but kicking off the Cold War between the U.S. and the Soviets. The three branches of the U.S. military had a hand in developing delivery vehicles/systems, which would enable them to remain relevant and keep the money flowing into their particular military force.

As early as 1949, which was still during the infancy of U.S. nuclear history, there arose serious issues within the defense community about nuclear delivery systems. An environment of distrust developed between a group of Admirals and the country's leadership that revolved around equitable funding of projects. This occurred when the project for the new aircraft carrier was canceled in favor of the B-36 heavy bomber. The B-36 was touted as the United States' main offensive weapon minimizing the role the U.S. Navy in strategic warfare. This showed a disharmony in the DOD that would last for many years as illustrated by the Army's concern's about their mission space.⁶⁶

According to "The Pentomic Era," author A.J. Bacevich concluded that the Air Force's importance grew even more under President Eisenhower's "New Look," and that President Eisenhower believed that the Army would not be needed to conduct combat operations in the light of WWII or Korea.⁶⁷ In continuing to lead the charge of providing protection to our allies and partners, the Executive Secretary penned the National Security Council (NSC) 162/2, which stated, "Within the free world, only the United States can provide and maintain, for a period of years to come, the atomic capability to counterbalance Soviet atomic power. Thus, sufficient atomic weapons and *effective means of delivery* are indispensable for U.S. security."⁶⁸ At the time, NSC 162/2

⁶⁶ Andrew L. Lewis, "The Revolt of Admirals," A Research Report (Maxwell AFB, AL: Air University, 1998), 1.

⁶⁷ A. J. Bacevich, *The Pentomic Era: The U.S. Army between Korea and Vietnam* (Washington, DC: National Defense University, 1993), 16.

⁶⁸ The Executive Secretary, "A Report to the National Security Council," Washington, DC: U.S. Government, October 30, 1953, 7.

was the highest level U.S. policy document, which implied that the Air Force has the most important mission

According to the Evolution of DOD Directive 5100.01, that during President Eisenhower's administration the stated, "Even in light of the Key West and Newport Agreements, problems continued some institutional, some parochial. In postwar competition for resources, the inter-Service rivalry continued to drag Congress back into the roles and missions fray."⁶⁹ According to the National Security Policy; Arms Control and Disarmament]Foreign Relations of the United States 1958–1960, Volume III, it is stated that President Eisenhower, "in order to tame interservice rivalries on budgetary and personnel matters, which Eisenhower had pushed through Congress in 1958 (3), the need for organizational reform of the military services was similar, and the President lectured the Joint Chiefs on their responsibility to subordinate their bureaucratic self-interest to 'the nation's interest'."⁷⁰ One would think that the military of a single nation would be potentially less selfish with regard to the awesome power of a nuclear weapon, but money to build programs seems to be a deciding factor. The evolution of the much faster deployable leg of the nuclear triad, the ICBM, provided a weapon that could be programmed to demolish a single Russian target with the push of a button. The ICBM's ultimate low cost and maintenance could be construed as an ideal trade-off to the much heavier and slower heavy bomber that labored down the runway and took countless hours to reach its target. While maintaining the last leg of the triad, the SLBM possesses the best chance for survival due to the sleek submarines that hide underneath the blanket of water, which can unleash a devastating first or counter strike without being detected. With regard to the effectiveness of the nuclear triad, Amy Woolf of the CRS states, "According to the Department of Defense, this mix of forces not only offered the United States a range of capabilities and flexibility in nuclear planning and complicated an

⁶⁹ Office of the Secretary of Defense, White Paper: Evolution of Department of Defense Directive 5100.01, accessed on February 18, 2015, http://www.odam.defense.gov/Portals/43/Documents/OMP/Functions/Evolution%20of%205100/DODD_5100.01_White_Paper_v4.0_18_Feb_2014_Single_Column.pdf, 10.

⁷⁰ National Security Policy; Arms Control and Disarmament Foreign Relations of the United States 1958–1960, Volume III, accessed February 18, 2015, <http://www.fas.org/spp/starwars/offdocs/ike/>.

adversary's attack planning, but also hedged against unexpected problems in any single delivery system."⁷¹ It was, in short, worth the money.

⁷¹ Woolf, *U.S. Strategic Nuclear Forces*, 4.

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III. POST-COLD WAR BOMBER MISSION

A. BUDGET PRESSURES

As stated by author Stephen Schwartz, “Since 1940, the United States has spent almost \$5.5 trillion (in constant 1996 dollars) on nuclear weapons and weapons-related programs, ...does not include \$320 billion in estimated future-year costs for storing and disposing of more than five decades’ worth or accumulated toxic and radioactive wastes and \$20 billion for dismantling nuclear weapons systems and disposing of surplus nuclear materials.”⁷² According to the January 2015 Projected Costs of U.S. Nuclear Forces, 2015–2024 from the Congressional Budget Office (CBO), the report states, “Over the next 10 years, CBO estimates, DOD’s costs would total \$227 billion, which is about \$6 billion (or 3 percent) more than the 10-year estimate published in 2013, and DOE’s would total \$121 billion, which is about \$13 billion (or 9 percent) less than CBO’s 2013 estimate.”⁷³ In addition to the costs mentioned above; those numbers do not include the costs to replace the aging bomber fleet that has been in existence since the 1950; nor the amount of money that has been spent to modernize the electrical and mechanical components necessary to keep these aircraft flying today. By continuing to place a band aid on a wound that will never heal, it has become apparent that the United States will continue to spend money in a foolish manner without seriously considering the alternative of amputating the bomber leg in order to repair the other two legs.

In the upcoming years, the Air Force seeks to increase its bomber fleet by an additional 100 new aircraft at a cost of \$80 billion.⁷⁴ Yet there has been little debate as to whether or not the Air Force requires a new bomber fleet. A more important question is,

⁷² Stephen I. Schwartz, *Atomic Audit: The Costs and Consequences of U.S. Nuclear Weapons since 1940* (Washington, DC: Brookings Institution Press, 1998), 3.

⁷³ Congressional Budget Office, “Projected Costs of U.S. Nuclear Forces, 2015–2024,” January 2015, accessed February 18, 2015, <http://www.cbo.gov/sites/default/files/cbofiles/attachments/49870-NuclearForces.pdf>, 1.

⁷⁴ Tom Z. Collina and the Arms Control Association Research Staff, “The Unaffordable Arsenal: Reducing the Costs of the Bloated U.S. Nuclear Stockpile,” An Arms Control Association Report, October 2014, accessed May 3, 2015, <http://www.armscontrol.org/reports/The-Unaffordable-Arsenal-Reducing-the-Costs-of-the-Bloated-U.S.-Nuclear-Stockpile>, Section I.

“Does the new bomber fleet need to be part of the nuclear triad?” Indeed, the bomber fleet is archaic and needs to be replaced (not overhauled) with up-to-date aircraft that can provide the United States with the critical capabilities to meet the requirements of today’s international landscape. It is true that the majority of the bomber’s mission has been converted from nuclear to conventional operations. The Air Force should eliminate the bombers from nuclear strategic consideration and focus on providing the president with a 100% conventional option in a crisis situation. Currently, the Air Force maintains a fleet of 159 bombers (B-52Hs—1960s, B-1Bs—1980s, B-2As—1990s). According to the Air Force, the life expectancy of bomber fleet is expected to last a couple more decades.⁷⁵ And according to the CBO, “Given the decades of service left in the current bomber fleet, the new bomber program can be delayed until the mid 2020s, saving \$32.1 billion over 10 years.”⁷⁶ The money saved could be used to buy additional KC-46A tankers and F-35A fighters. Even with the production delay of 10 years a new bomber would still be completed prior to the end of the current bomber fleet’s service life. The Office of Management and Budget (OMB), which is responsible for the President’s budget, agreed the performance of the current fleet is good enough to not rush into the production of a new bomber. The OMB report concludes that, “only a small percentage of LSRB’s costs would go directly to making the bombers capable of carrying nuclear weapons.”⁷⁷ This cost reduction is due to the aircraft not needing to operate in a nuclear environment. Eventually the Air Force recognizes that pilots will be phased out in favor of flying the aircraft via remotely, which will also lead to cost savings. Taking these factors into account, the development of a new long range conventional bomber is long overdue, but the nuclear mission adds burdensome requirements. Removing the heavy bomber from the triad would ease these burdens and allow STRATCOM to focus on SSBNs and ICBMs for U.S. nuclear deterrence.⁷⁸

⁷⁵ Ibid., Section I.

⁷⁶ Ibid., Section I.

⁷⁷ Ibid., Section I.

⁷⁸ Ibid., Section I.

By freeing up the money and resources from the bomber fleet, DOD can focus on its plan to replace the Ohio-class ballistic missile submarines (SSBNs) with 12 ballistic missile submarines, otherwise known as the SSBN(X) or the Ohio Replacement.⁷⁹ Currently, the Navy has 14 SSBNs that require a four year mid-life nuclear reactor refueling, while the proposed SSBN(X) does not necessitate that refueling requirement, thus resulting in the Navy's request for 12 submarines instead of 14. As stated by author Tom Collina, "And the U.S. nuclear force remains far larger than is necessary to deter nuclear attack against the United States or its allies."⁸⁰ In light of the evolving deterrence mission and mounting budget pressures, many analysts conclude that the United States would be best served by buying eight submarines instead of 12. This alternative is projected to save approximately \$16 billion over 10 years.⁸¹

With regard to the ICBM, a life extension program in the neighborhood of \$7 billion ensures that the ICBM force remains reliable and effective through 2030.⁸² In the next couple of years, the Air Force will decide whether or not to continue the life expectancy of the Minuteman after 2030 or begin the research and development into building a new missile. In a 2014 RAND study, the overall report supported the idea of extending the life of the Minuteman, resulting in increased savings and that the only reason to entertain a new missile would be if the current world landscape required new technology.⁸³ RAND also concluded that the biggest obstacle facing the possibility of maintaining the current inventory of Minuteman missiles was the current inventory of test missiles, which would be depleted by 2030.⁸⁴

These pressures on the ICBM force could be solved if the United States drops its Minuteman inventory from 450 to 300. This drop in ICBMs would also have the effect of

⁷⁹ Ibid., Section I.

⁸⁰ Ibid., Section I.

⁸¹ Ibid., Section I.

⁸² "U.S. ICBM replacement to soon emerge, officials seek SLBM commonality," IHS Jane's 360, October 23 2015, accessed December 1, 2015, <http://www.janes.com/article/55465/us-icbm-replacement-to-soon-emerge-officials-seek-slbm-commonality>.

⁸³ Lauren Casten et al., "The Future of the U.S. Intercontinental Ballistic Missile Force," Santa Monica, CA: RAND, Project Air Force, 2014.

⁸⁴ Ibid.

providing enough test missiles for decades to come. The cost of maintaining the missiles in the silos for the next 39 is between \$60–90 billion—in comparison to building a new silo-based missile that would cost between \$80–125 billion. Of course, doing nothing and maintaining the current missiles in their silos is the cheapest option. However, if the United States wants to keep pace with Russia and China and their evolving mobile missile launch capabilities, then the total cost for a major shift toward mobile systems could reach \$124–219 billion, according to some estimates.⁸⁵ Although, these numbers are quite large, a new missile could be cost effective in the context of a dyad and downsized arsenal. Further cost savings could be incurred if the United States decides to reduce its ICBM force from 450 to 300. If the United States decides to stay with the Minuteman, the Air Force could save approximately \$15 billion in the next 10 years.⁸⁶

Since the Cold War ended, America adjusted its defense and deterrence needs away from Russia to focus on terrorism and terrorist groups seeking to acquire nuclear weapons. Terrorist groups may be looking for nuclear states with vulnerable security gaps in which to acquire sensitive equipment and technology with the hope of building and using a nuclear weapon. Members of Congress have taken the lead to address this threat. In a letter drafted up by Senators Dianne Feinstein (D-CA) and Jeff Merkley (D-OR), they asked the Obama Administration to increase funding for nonproliferation and nuclear security programs aimed at reducing vulnerabilities in global fissile material stockpiles.⁸⁷ In their letter, which was signed by 26 Senators from both sides of the aisle, the Senators argued,

unsecured nuclear material poses an unacceptable risk to U.S. national security...Reducing budgets for agencies and programs that help keep nuclear and radiological materials out of the hands of terrorists is out of sync with the high priority that President has rightly placed on nuclear and

⁸⁵ Collina, “The Unaffordable Arsenal,” Section I.

⁸⁶ Ibid., 14.

⁸⁷ Nickolas Roth, “26 Senators Call for Increasing Nuclear Security Funding,” Harvard University Belfer Center for Science and International Affairs, accessed February 17, 2015, <http://www.nuclearsecuritymatters.belfercenter.org/blog/26-senators-call-increasing-nuclear-security-funding>.

radiological material security and signals a major retreat in the effort to lock down these materials at an accelerated rate.⁸⁸

Deterrence has little value in combating this threat. In supporting reductions in the U.S. arsenal the Arms Control Association voiced the opinion that “U.S. nuclear weapons do not address today’s most pressing security threats, including extreme terrorism, unsecured nuclear material and dangerous pathogens, and the further spread of nuclear weapons.”⁸⁹ Many analysts agree. In her article “Obama’s Mixed Bag on Nuclear Weapons,” Sarah Tully captured this sentiment that upgrades to the strategic arsenal do not protect the United States from the most urgent threats.

In order to get the go-ahead from opponents in Congress on the New START Treaty with Russia, Obama agreed to spend \$84 billion in nuclear weapons modernization over the next decade, a number the Congressional Budget Office estimates will likely come in at \$355 billion with others estimating \$1 trillion over 30 years. This is unnecessary spending on modernization that isn’t needed to meet today’s threats.⁹⁰

A smaller arsenal not only saves money but enables us to focus on more realistic threats, like preventing terrorists from acquiring nuclear weapons.

B. DOD-DOE TENSIONS

Another problematic aspect of the current nuclear debate is the tense relationship between the Department of Defense (DOD) and the Department of Energy (DOE). Much like the relationship between the Democrats and the Republicans, the tension between DOD-DOE has eroded into a political tug-of-war over the future of nuclear weapons. In 2010, the DOD and DOE signed a Memorandum of Agreement (MOA) concerning modernization of the U.S. nuclear infrastructure.⁹¹ Reporting on this tension, the Union of Concerned Scientists observed:

⁸⁸ Ibid.

⁸⁹ Collina, “The Unaffordable Arsenal.”

⁹⁰ Sarah Tully, “Obama’s Mixed Bag on Nuclear Weapons,” Nukes of Hazard: A Project of the Center for Arms Control & Non-Proliferation, 29 October 2014, <http://www.nukesofhazardblog.com/story/2014/10/28/155215/69>.

⁹¹ Memorandum of Agreement between the Department of Defense and the Department of Energy Concerning Modernization of the U.S. Nuclear Infrastructure, accessed April 15, 2015, http://fas.org/irp/congress/2011_hr/nw-moa.pdf, 1–5.

The agreement has had the unintended consequence of highlighting NNSA's troubled cost-estimating process...In the early days, it was decided that civilians should control both the decision to use nuclear weapons and their production. The military built the delivery systems and handled implementation (that is, targeting and delivery). That division is reflected both in the Congressional appropriations process and in the government. The House and Senate Energy and Water Development appropriations committees make final decisions on funding for nuclear weapons development and production, the work done by the DOE/NNSA. Pentagon funding is handled separately in the Defense appropriations committees. This is partly related to the history of the Army Corps of Engineers, which ran the Manhattan Project. Because it does mostly civilian work on water projects, the Corps was and is funded by the Energy and Water appropriations bill.⁹²

The Nuclear Weapons Council has the arduous task of determining requirements for nuclear weapons and its maintenance, but the NNSA has the authority to determine in what capacity they will meet those mandated requirements.⁹³

At the heart of the NNSA's mission is to maintain and modernize the current generation of nuclear warheads and bombs in the U.S. arsenal. This massive undertaking is very expensive and is projected to cost in excess of \$350 billion in the next 36 years.⁹⁴ In an article entitled, "The Trillion Dollar Triad," authors Jon B. Wolfsthal, Jeffrey Lewis, and Marc Quint, state, "In fact, the thirty-year estimate for the NNSA mission is predicted to be more expensive and prone to complicating factors than any other element of the nuclear mission over the next few decades."⁹⁵ This extremely vital mission of maintaining the current arsenal through such programs as LEP and SSMP jeopardizes the DOD's plan of committing funds to procure additional submarines and a new line of strategic heavy bombers.⁹⁶ The hard decision of where the money should go to serve the

⁹² Stephen Young, "DOD Agreement Sheds Light on NNSA Problems," Union of Concerned Scientists, August 20, 2012, accessed September 10, 2015, <http://allthingsnuclear.org/syoung/dod-doe-agreement>.

⁹³ Ibid.

⁹⁴ Jon B. Wolfsthal, Jeffrey Lewis, and Marc Quint, "The Trillion Dollar Triad, U.S. Nuclear Modernization Over the Next Thirty Years," James Martin Center for Nonproliferation Studies, Monterey, California, January 2014, accessed December 10, 2014, http://www.cns.miis.edu/opapers/pdfs/140107_trillion_dollar_nuclear_triad.pdf, 25.

⁹⁵ Ibid., 26.

⁹⁶ Ibid., 26.

security interests of the United States and its allies and partners should determine our priorities. The U.S. must make difficult choices between deeply established weapon programs, delivery platforms and maintenance programs that pit DOD, the services, DOE, and NNSA against each other in a fight for resources.

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IV. CURRENT STATE OF NUCLEAR DETERRENCE DOCTRINE AND STRATEGY

A. HISTORY AND PRACTICE OF NUCLEAR POSTURE REVIEWS

On 29 October 1993, Secretary of Defense Les Aspin announced a comprehensive review of America's nuclear posture. According to Aspin, the Nuclear Posture Review (NPR) was, "The first DOD study of its kind to incorporate reviews of policy, doctrine, force structure, operations, safety and security, and arms control in one look."⁹⁷ But as Aspin later acknowledged, "It would be really impossible to overstate the degree to which our defense planning focused on the Soviet Union...It determined the size of the defense budget, the kinds of divisions we had, how we organized our forces...even how we designed weapons."⁹⁸ This initial NPR would build upon the DOD Bottom Up Review, which would focus on the deterrent requirements rather than the technical warfighting capabilities of nuclear weapons. The process would encompass a combined effort consisting of five individuals led by Ashton Carter, who was the Assistant Secretary of Defense for Nuclear Security and Counterproliferation. The review, which would be scrutinized by both military and civilian specialists, revolved around six topics. These topics included: the role of nuclear weapons; nuclear force structure; nuclear force operations; nuclear safety and security; the relationship between U.S. nuclear posture and counterproliferation policy; and threat reduction policy with the former Soviet Union.⁹⁹

In order to better understand the thought process of the United States after the Cold War, a look back at the NPR throughout the last three administrations sheds some light on the direction in which the U.S. nuclear policy and the continued direction in which the U.S. nuclear posture determines the relevancy of today's nuclear triad. Relatedly, world events dictate how each administration deals with nuclear policy and

⁹⁷ Hans M. Kristensen, "The 1994 Nuclear Posture Review," accessed October 21, 2014, <http://www.nukestrat.com/us/reviews/npr1994.htm>.

⁹⁸ McDonough, *Nuclear Superiority: The 'new triad'*, 29.

⁹⁹ Kristensen, "The 1994 Nuclear Posture Review."

how our nuclear forces help ensure that other countries do not build or acquire nuclear weapons.

1. The Clinton Administration

During President Bill Clinton's administration, the 1994 review process of the NPR was plagued by bureaucratic infighting when Ash Carter laid out his vision of nuclear weapons. During an interview with the L.A. Times he said, "Our intention is to have a military that doesn't need to use (nuclear, biological, and chemical) weapons. We can use conventional forces to prevail anywhere in the world."¹⁰⁰ To intensify his stance against nuclear weapons, Asst. Secretary Carter even proposed leaving the confines of the nuclear triad and evolving into a monad by eliminating ICBMs and conventionalizing the bomber fleet, while outfitting only ten nuclear submarines with the remaining warheads. However, the idea of reducing the nuclear triad to a monad was well not received by the Pentagon or the nuclear establishment.¹⁰¹ This battle continued all the way up the steps of Capitol Hill, where the top military brass wrote a joint letter denouncing Dr. Carter's efforts to bypass the process to pursue what they saw as radical ideas. In the end, DOD and DOE opposition thwarted Dr. Carter's academic vision.¹⁰² However, the ground was laid for broader debate over the requirements of deterrence in the post Cold War world.

2. The Bush Administration and the rise of the conventional strategic forces

During President George W. Bush's term in office, the White House pursued the creation of what would be referred to as the 'New Triad' or what would be known as Global Strike. According to the foreword of the 2002 Nuclear Posture Report the new strategy would consist of, "offensive strike systems (both nuclear and non-nuclear); defenses (both active and passive); and a revitalized defense infrastructure that would provide new capabilities in a timely fashion to meet emerging threats."¹⁰³ As author

¹⁰⁰ Ibid.

¹⁰¹ Ibid.

¹⁰² Ibid.

¹⁰³ Federation of American Scientists, "Nuclear Posture Review Report," accessed September 22, 2015, <http://www.fas.org/sgp/news/2002/01/npr-foreword.html>.

David McDonough points out, “The ‘New Triad’ represented a complex and potentially contradictory effort to reduce American self-deterrence by de-emphasizing the role of nuclear weapons through an expansion of non-nuclear components in U.S. deterrence calculus, while simultaneously attempting to modify American nuclear forces to play a more tailored deterrent role against potential adversaries.”¹⁰⁴ A major concern following the creation of this ‘New Triad’ was what role --if any-- would the existing Cold War nuclear triad of bombers, ICBMs, and SLBMs play in the administration’s new thinking? In practice, they would continue to play their established role, but would be reduced in their role and quantity through reductions. The second leg of the triad focused on the U.S. defenses which should reduce an adversary’s success during limited attacks and provide assurance in the event that deterrence fails. The final leg emphasized precision conventional strike forces.¹⁰⁵

With the ever-evolving international landscape shifting from state to non-state actors (rogue elements), it became clear to the Bush Administration that a change in America’s approach was required. According to McDonough, “The central goal of the new triad is the successful dissuasion and/or deterrence of a rogue state armed with WMD, and if necessary, its decisive and damage-limiting defeat in the event of deterrence failure.”¹⁰⁶

Amy Woolf of CRS summed up the 2002 NPR as follows,

The Bush Administration has argued that its new nuclear posture will move the United States further along the path away from reliance on nuclear weapons. Although these weapons will remain a part of the U.S. deterrent posture and a part of its offensive strike capability, the Administration has stated that the addition of ballistic missile defenses and the growing capabilities of conventional precision guided weapons will give the United States a growing number of options, in addition to the

¹⁰⁴ McDonough, *Nuclear Superiority: The ‘new triad’*, 11.

¹⁰⁵ Nuclear Posture Review [Excerpts] 8 January 2002, Nuclear Posture Review Report, accessed October 21, 2014, <http://web.stanford.edu/class/polisci211z/2.6/NPR2001leaked.pdf>.

¹⁰⁶ McDonough, *Nuclear Superiority: The ‘new triad’*, 63.

threat of offensive nuclear retaliation, when threatened by hostile nations.¹⁰⁷

These options would provide the United States with multiple deterrence strategies which could be utilized over a broad range of opponents and circumstances. The introduction of non-nuclear capabilities into the discussion had its detractors, but as Keith Payne points out, “The NPR’s introduction of nonnuclear forces into the strategic deterrence equation has nothing to do with rejecting deterrence in favor of war fighting or blurring the distinction between nuclear and conventional weapons.”¹⁰⁸

Yet another theme of the 2002 NPR emphasized America’s improved relations with Russia and the United States expanded conventional and defensive capabilities. This would allow for a decrease in America’s dependence on its nuclear option and pursue deeper reductions in our nuclear arsenal. In addition, the NPR placed emphasis and reliance on maintaining and building up the ICBMs, which it considered the most cost effective leg of the triad. When considering the political structure of the U.S. government, the one thing that is a foregone conclusion is that political landscapes are always in a state of perpetual motion. Perhaps it was a bit of foreshadowing when the authors of Strategic Offensive Forces and the Nuclear Posture Review’s “New Triad” stated, “When the matter does arise, unless the political landscape has been radically altered, there will surely be opposition to a new ‘Cold War’ strategic nuclear weapon—from allies, Russia, China and the Third World. But the most important opposition will come from inside the U.S. political system; for that reason, it is essential that we continue to build support for the logic of the NPR, particularly for the transitional and enduring values of a reduced but still significant strategic nuclear force.”¹⁰⁹

¹⁰⁷ Amy F. Woolf, “The Nuclear Posture Review: Overview and Emerging Issues,” CRS Report for Congress, RS21133, 31 January 2002, accessed December 5, 2015, <http://www.iwar.org.uk/news-archive/crs/8039.pdf>.

¹⁰⁸ Keith B. Payne, “The Nuclear Posture Review: Setting the Record Straight,” *The Washington Quarterly*, (2005): 141.

¹⁰⁹ National Institute For Public Policy, “Strategic Offensive Forces and the Nuclear Posture Review’s “New Triad,” March 2003, accessed October 21, 2014, <http://www.nipp.org/National%20Institute%20Press/Archives/Publication%20Archive%20PDF/Strategic%20Offensive.pdf>.

In 2003, Global Strike was assigned to STRATCOM under the guise of Concept Plan (CONPLAN) 8022.¹¹⁰ As stated by nuclear analyst Hans M. Kristensen,

The Global Strike mission and CONPLAN 8022 differ from previous missions and plans both in capabilities and intent. The official justification is that they are intended to make deterrence, dissuasion, and assurance more credible by increasing the options available to the president. To that end, Global Strike is first and foremost about developing global effects to destroy or incapacitate targets in the expectation that deterrence will fail sooner or later. Rather than waiting for the mushroom cloud to appear, a phrase used several times by the Bush administration, Global Strike is focused on defeating the threat before it is unleashed.¹¹¹

After several revisions and a failed attempt to merge into a mix of Global and Space, CONPLAN 8022 was scrapped in 2006 and merged with the existing strategic war plan OPLAN 8010, Strategic Deterrence and Global Strike. What confuses the casual reader is the mission of Global Strike and OPLAN 8044, which apparently have nearly the identical mission. In December 2008, after several revisions and name changes the final version of Global Strike was entitled: OPLAN 8010–08 Strategic Deterrence and Global Strike. The final plan can be simply described as a global deterrence plan, which takes the steps necessary to provide integrating deterrence activities across government agencies and with U.S. allies.¹¹²

In summary, the Bush nuclear policy essentially deferred the big questions about deterrence and force posture while making counterterrorism its top priority.

3. The Obama Administration and the Prague Agenda

As the Bush era came to a close, the Barack Obama era began with President Obama's Prague speech. The administration quickly moved to produce its own NPR. As stated by then Secretary of Defense Robert Gates, "This NPR places the prevention of nuclear terrorism and proliferation at the top of the U.S. policy agenda, and describes

¹¹⁰ Hans M. Kristensen, "U.S. Strategic War Planning After 9/11," accessed October 12, 2015, <https://www.nonproliferation.org/wp-content/uploads/npr/142kristensen.pdf>, 376.

¹¹¹ *Ibid.*, 377.

¹¹² Hans M. Kristensen, "Counter-Proliferation and U.S. Nuclear Strategy," *U.S. Nuclear Strategy*, accessed October 21, 2014, <http://fas.org/programs/ssp/nukes/publications/1/nucstrat09.pdf>.

how the United States will reduce the role and numbers of nuclear weapons.”¹¹³ With the ever changing international security environment, the 2010 NPR continued with the theme of the 2002 NPR: which was since the Cold War had ended, the real enemy was not Russia, but rather terrorist groups seeking to acquire nuclear weapons to advance their cause. Concerns that terrorist groups are on the lookout for nuclear states with vulnerable security gaps that could be exploited to acquire sensitive equipment and technology, with the hope of building and deploying a nuclear weapon, underlie the President’s priorities.¹¹⁴ With the fear of a looming threat of terrorist groups hell bent on acquiring a nuke, compounded by the continued threat posed by nuclear proliferation and a few countries at odds with the U.S. that ramped up their effort to acquire nuclear weapons, the Obama strategy attempted to reduce the number nuclear of weapons while maintaining America’s deterrent credibility. However, the slippery slope of encouraging pressures to reduce our nuclear arsenal could lead people to question the credibility of the U.S. nuclear deterrent. Moreover, credibility may be undermined by widespread recognition of our aging nuclear facilities and weapons that have not been modernized.

With the desire to reduce the need and numbers of nuclear weapons, the 2010 NPR supports the nuclear triad as still being essential to nuclear deterrence, but the 2010 NPR states, “Stable deterrence can be maintained while reducing U.S. strategic delivery vehicles—inter- continental ballistic missiles (ICBMs), submarine-launched ballistic missiles (SLBMs), and nuclear-capable heavy bombers—by approximately 50 percent from the START I level, and reducing accountable strategic warheads by approximately 30 percent from the Moscow Treaty level.”¹¹⁵ The continuing challenge of maintaining all three legs of the triad will be to convince Congress that the each leg needs to be modernized while at the same time reducing the stockpile. According to the White House press release of 19 June 2013, entitled “Nuclear Weapons Employment Strategy of the United States,” the president’s guidance, “affirms that the United States will maintain a

¹¹³ *Nuclear Posture Review Report*, April 2010, i, <http://www.defense.gov/npr/docs/2010%20nuclear%20posture%20review%20report.pdf>.

¹¹⁴ *Ibid.*, iv.

¹¹⁵ *Ibid.*, ix.

credible deterrent...directs DOD to strengthen non-nuclear capabilities and reduce the role of nuclear weapons in deterring non-nuclear attacks...supported significant investments to modernize the nuclear enterprise and maintain a safe, secure, and effective arsenal.”¹¹⁶ As noted in the 2010 NPR, “Under the New START, dual-capable bombers will count as one strategic delivery vehicle and one warhead.”¹¹⁷ And since heavy bombers are not considered to pose a huge first strike threat and most are utilized in conventional operations, perhaps the time has come to totally shift the heavy bomber fleet from a nuclear mission to a conventional mission. Keeping the bomber leg provides the president with an option in case of a nuclear war, but the United States has stated that it desires to lessen the role of nuclear weapons and believes that deterrence can be achieved with conventional strategic systems.

An interesting point in the NPR is that heavy bombers provide a rapid and effective hedge, as well as a visible presence in forward deployed locations, which signal U.S. resolve and continuing commitment to our allies and partners.¹¹⁸ However, forward deploying submarines and reminding others of our continued ICBM capability could also achieve the same goal. Many would argue that the heavy bomber is too slow for it to be an effective counter-measure because they would have to be in the air during an attack to be redirected to effectively strike the enemy, whereas an ICBM could arrive much faster and require less manpower to launch. The desire to have multiple options for the president to take into consideration prior to launching into a potential nuclear war is understandable—options are always desirable.¹¹⁹

In the meantime, the President’s policy recognized that while nuclear weapons still exist, the United States must increase efforts to strengthen a reduced U.S. nuclear force by investing in leadership, expertise, and excellence in the realm of nuclear

¹¹⁶ Office of the Press Secretary, “FACT SHEET: Nuclear Weapons Employment Strategy of the United States,” June 19, 2013, <http://www.whitehouse.gov/the-press-office/2013/06/19/fact-sheet-nuclear-weapons-employment-strategy-united-states>.

¹¹⁷ *Nuclear Posture Review Report*, 21.

¹¹⁸ *Ibid.*, 19–20.

¹¹⁹ *Ibid.*, 1–42.

capabilities.¹²⁰ This has to be accomplished during tight fiscal constraints and an international landscape that continues to shift with each change in regime leadership. Hard decisions will need to be made and no matter which political party is in control of the U.S. government, bipartisan input needs to trump partisan politics for the greater good of the United States, its allies and partners for the world to strive towards the goal of eliminating the risk of nuclear war. The Obama Administration did not make the hard choices, but might have achieved some of its key objectives by eliminating the manned bombers while modernizing the remaining elements of the strategic arsenal.

B. THE CHANGING MISSION OF THE UNITED STATES STRATEGIC COMMAND (STRATCOM)

According to STRATCOM's mission statement, its mission is to, "Detect, deter and prevent strategic attacks against the United States and our Allies."¹²¹ One of its main priorities is to provide the United States and its citizens with an effective nuclear deterrent force.¹²² One of the ways that this mission is accomplished by STRATCOM is by the formation of the Joint Functional Component Command for Global Strike (JFCC GS), which maintains and operationalizes the nation's strategic deterrence (nuclear) war plan and providing functional management of the nation's comprehensive nuclear planning system.¹²³ According to the STRATCOM functional components website, the JFCC (GS), "conducts kinetic (nuclear and conventional) and non-kinetic effects planning. GS manages global force activities to assure allies and to deter and dissuade actions detrimental to the United States and its global interests; should deterrence fail, employs global strike forces in support of combatant commander."¹²⁴

With the constant shifting of stockpile numbers and requirements, as well as, President Obama's desire for an eventual drawdown, STRATCOM has found itself

¹²⁰ Ibid., 7.

¹²¹ U.S. Strategic Command "Snap Shot," A summary of USSTRATCOM facts and information, <http://www.stratcom.mil/factsheets/>.

¹²² Ibid.

¹²³ Ibid.

¹²⁴ U.S. Strategic Command, accessed October 22, 2014, http://www.stratcom.mil/functional_components/.

battling the very bureaucracy that instructed it to provide the United States with an effective nuclear deterrent force. This shift has led STRATCOM to remain flexible in its strategic planning, while continuing to execute its mission of detecting, deterring, and preventing strategic attacks. Amidst all the political rhetoric, budget cutbacks, and emphasis on reducing the nuclear arsenal, the core mission of STRATCOM remains largely unchanged. This point was illustrated when former STRATCOM Commander Air Force Gen. Robert Kehler told the House and Senate armed services committees, “As long as nuclear weapons exist, U.S. Strategic Command’s top priority must be to deter nuclear attack with a safe, secure and effective strategic nuclear deterrent force.”¹²⁵ However, STRATCOM has not been immune from politics. During the Bush administration it ramped up its Conventional Global Strike operations, and established new subcomponents for Space, Cyber and missile defenses. STRATCOM also was responsible for Combatting Weapons of Mass Destruction.¹²⁶ These new capabilities have had to adjust to Obama priorities and may have detracted from the central deterrence mission. More adjustments may be necessary in connection with changing missions and priorities.

C. CYBER-SPACE AND STRATEGIC DETERRENCE

The modern battlefield, which would normally encompass land, sea, or air domains, has been expanded by to include a battlefield that exists in an area commonly referred to as cyber-space. A definition of cyber-warfare is required to better illustrate what actions are being taken in this new arena. Dr. Andrew Krepinevich says, “Cyber warfare, then, can be defined as actions by nation-states and non-state actors employing cyber weapons to penetrate computers or networks for the purpose of inserting, corrupting, and/or falsifying data; disrupting or damaging a computer or network device;

¹²⁵ Donna Miles, “Nuclear Deterrence Remains Key Stratcom Mission, Commander Says,” DOD News, accessed October 21, 2014, <http://www.defense.gov/news/newsarticle.aspx?id=119703>.

¹²⁶ Andrew Feickert, “The Unified Command Plan and Combatant Commands: Background and Issues for Congress,” *Congressional Research Service*, January 2013, 23.

or inflicting damage and/or disruption to computer control systems.”¹²⁷ With the invention of the Internet some 20 years ago, Krepinevich also noted,

With expansion came increasing applications for the Internet, which fed further expansion and still more applications, to include the rise of a cyber economy, financial transactions, widespread automated regulation of key control systems, an explosion in the sharing and storing of information (including highly sensitive information), the emergence of new forms of electronic communication such as e-mail, and social networking, among others...The cyber economy, which includes multiple financial systems, has spawned cyber crime. Storage of sensitive information on networks has given birth to cyber espionage against governments and cyber economic warfare against businesses. And in periods of crisis and conflict states have been subjected to various forms of cyber attack at both the tactical and operational levels of war.¹²⁸

According to Krepinevich, “Given the increasing reliance on information systems in general and access to the Internet in particular, critical infrastructure is growing progressively more vulnerable to cyber-attack.”¹²⁹ This perceived vulnerability raises the potential for the United States to experience a full-blown cyber-attack that could produce strategic effects. One of the individuals who sounded the alarm on the potential threat of cyber-attacks is former Secretary of Defense Leon Panetta, who said, “When it comes to national security, I think this [i.e., cyber warfare] represents the battleground for the future. I’ve often said that I think the potential for the next Pearl Harbor could very well be a cyber-attack. If you have a cyber-attack that brings down our power grid system, brings down our financial systems, brings down our government systems, you could paralyze this country.”¹³⁰

To demonstrate just how the cyber concept is gaining momentum, PLA Senior colonel Ye Zeheng and his colleague Zhao Baoxian wrote an essay in the *China Youth*

¹²⁷ Andrew F. Krepinevich, Jr., “Cyber Warfare: A “Nuclear Option”?” Center for Strategic and Budgetary Assessments, 2012, 8.

¹²⁸ Ibid., 1.

¹²⁹ Ibid., i.

¹³⁰ “Cybersecurity ‘battleground of the future,’” *United Press International*, February 10, 2011, accessed October 22, 2014, www.upi.com/Top_News/U.S./2011/02/10/Cybersecurity-battleground-of-thefuture/UPI-62911297371939/.

Daily that placed considerable emphasis on the importance of China's cyber warfare capabilities. They concluded, "Just as nuclear warfare was the strategic war of the industrial era, cyber-warfare has become the strategic war of the information era, and this has become *a form of battle that is massively destructive and concerns the life and death of nations.*"¹³¹ Clearly the cyber domain must be included in any future force posture alignment.

It is probable that more state and non-state actors will begin to develop an array of cyber arsenals rather than pour money and resources toward the development of nuclear weapons. Given the United States and the world's reliance on information technology as a potential source of strategic weakness, we should assume our adversaries will try to exploit network weaknesses for strategic advantage.¹³² Cyber space will only continue to grow in magnitude with the increased availability of technology. Sensitive information will continue to be stored and shared on network computers, including secure USG networks. On the strategic cyber threat, Krepinevich concludes,

it appears that a major cyber attack that would inflict catastrophic damage on the critical infrastructure of an advanced economy is both plausible, and much *more likely* to occur than a nuclear attack with the same objective. If this is the case, it is long past time for states to craft strategies to address this threat, and for the strategic studies community to devote far greater attention to this challenge to international peace and stability.¹³³

As mentioned earlier, nuclear weapons provide greater destruction, but cyber-attacks have the potential to paralyze a country. Instead of continuing to provide funding for a bomber fleet in desperate need of overhauling, Congress and the President should invest in cyber technology and ensure that STRATCOM has the means necessary to protect America's strategic weapons and related systems from cyber attacks.

D. THE FUTURE OF STRATEGIC DETERRENCE

The evolution of the NPR saw three distinct administrations prepare the nation during the initial post-Cold War era, an era defined by terrorism, and a period when the

¹³¹ Krepinevich, "Cyber Warfare: A "Nuclear Option"?" 3.

¹³² *Ibid.*, 10–82.

¹³³ *Ibid.*, 81.

role of nuclear weapons and deterrence remained in limbo. Presidents Clinton, Bush, and Obama believed that dependence on nuclear weapons needed to be lessened with an emphasis on conventional weapons to deter and prevent new nations from acquiring nuclear weapons. Each administration called for the reduction of nuclear weapons between the United States and Russia. Each president faced polarizing international landscapes that influenced the direction of nuclear policy. Budget constraints compounded by wars in Iraq and Afghanistan relegated nuclear programs to a backseat. Although budget issues are nothing new, the strain of having to provide budgets to prolonged wars and domestic economic troubles brought heightened scrutiny to the cost of maintaining nuclear weapons. Why spend billions on nuclear weapons when for the last 65 years the world has not used them?

In the middle of this battle STRATCOM was forced to adjust. With the constant shifting of stockpile requirements STRATCOM has had to battle the multiple bureaucracies that govern the nuclear deterrent mission. As a military organization, STRATCOM has no choice but to carry out the missions assigned to it, regardless of domestic and international political changes that affect its budget and priorities.

With technology advancing in new ways, the traditional battlefields of land, sea, and air are adding new ones such as cyber and space. The ability of state and non-state actors to gain control of sensitive information makes deterrence harder. Viruses and computer programs can infiltrate and paralyze a country from the very technology that most of us have grown accustomed to utilizing in everyday life. Cyber-terrorists may not yet be able to initiate catastrophic destruction like nuclear weapons, but their ability to shut down a country's infrastructure or crumble financial institutions can still bring strategic consequences. With growing dissent for the use and necessity of nuclear weapons, budget constraints, and the expanding technology battlefield, it is time to consider a shift from the traditional triad by removing the manned bomber leg and shifting resources to combat new threats, such as cyber-warfare.

V. THE WAY AHEAD FOR STRATEGIC DETERRENCE

The invention of the nuclear weapon and its use against Japan at the end of World War II ushered in a new age of warfare that would forever change the landscape of the world. The knowledge about how to construct such a devastating weapon kicked off an arm's race between the United States and the Soviet Union, which eventually steered the U.S. to create the nuclear triad intended to promote an era of nuclear deterrence and stave off World War III. Most scholars and decision makers agree that the triad was successful in deterring the U.S. and USSR from engaging in a nuclear offensive because launching one would lead to the destruction of both nations. The ability to deter also led many non-nuclear nations to live under the U.S. nuclear umbrella and depend on the United States' forward deployed nuclear weapons to shield them from Soviet attack.

With the collapse of the former Soviet Union bringing about the end of the Cold War, the focus shifted to placing an increasing emphasis on other priorities, including being fiscally responsible. I argue that this created an opportune time for the United States to consider removing the manned bombers from the nuclear triad and focus on forming a dyad for nuclear deterrence. Nuclear warheads and their associated delivery platforms continue to age and break down. The United States is faced with hard decisions to either make across the board cuts to each leg of the triad or break up the triad.¹³⁴ The costs of a major rebuild of the weapons and delivery systems could be not feasible. Today, the United States faces tough decisions on whether to spend billions of dollars on modernizing an aging nuclear triad or to fund programs that provide for the betterment of our citizens. Due to the costs of two major wars in Iraq and Afghanistan, as well as, domestic downswings in the economy, lawmakers from both sides of the aisles have called for a sharp scrutiny of defense spending in an attempt to bring about sound fiscal responsibility.¹³⁵

¹³⁴ Amy F. Woolf, "U.S. Strategic Nuclear Forces: Background, Developments and Issues," *Congressional Research Service*, RL33640, March 10, 2016.

¹³⁵ Markey, "Markey and Merkley Introduce Legislation."

According to Joint Publication 1–02, the Department of Defense Dictionary of Military and Associated Terms defines deterrence as, “The prevention of action by the existence of a credible threat of unacceptable counteraction and/or belief that the cost of action outweighs the perceived benefits.”¹³⁶ This was the main role that nuclear weapons have served and was accomplished through the triad. It was the philosophy of both the former Soviet Union and the United States in maintaining a second strike capability to deter a disarming first strike. Now that the international security landscape has changed, so must our force posture. As one of the five key objectives in the 2010 NPR, a major component of the United States declared nuclear policy is reassuring U.S. allies and partners. Communication of U.S. regional deterrence commitments is still important, and a role that is suited for heavy bombers.¹³⁷ It would be a mistake to eliminate heavy bombers without the agreement of our allies and partners—not to do so would erode the trust in the United States extended deterrence guarantee possibly leading to more states pursuing a nuclear capability.

To assure our allies and partners, the United States would need to demonstrate that we could signal any potential adversaries our intent to escalate to nuclear use during a crisis. Unfortunately, SLBMs and ICBMs are less suited for this mission. The U.S. in the recent past has reportedly used heavy bombers to signal to North Korea that the United States would entertain a nuclear option to defend South Korea and Japan.¹³⁸ One possible solution to replace the heavy bombers is to increase its fighter-based nuclear delivery platforms. As is the case in Europe with NATO allies, this fighter platform could be used to signal intent to an adversary in concert with assuring our allies and partners. In his article entitled, “Deterrence, the Triad, and Dyads,” author Kurt Guthe wrote that if the situation was bad enough, the United States could use an escalatory deterrence communication in the form of a fighter platform combined with “testing” an

¹³⁶ Department of Defense Dictionary of Military and Associated Terms, 2015, 67.

¹³⁷ *Nuclear Posture Review Report*, iii.

¹³⁸ Thom Shanker and Choe Sang-Hun, “U.S. begins stealth bombing runs over South Korea,” *The New York Times*, March 28, 2013, http://www.nytimes.com/2013/03/29/world/asia/us-begins-stealth-bombing-runs-over-south-korea.html?_r=0.

ICBM or SLBM.¹³⁹ In fact, Iran, China, and North Korea have all used ballistic missile tests to signal in response to international pressures.¹⁴⁰ Bombers are good, but not the only option.

Another counter argument for relying on a dyad consisting of just ICBMs and SLBMs is that without the heavy bomber, the United States loses the ability for the “rapid upload of a substantial number of nuclear warheads.”¹⁴¹ The inability to “upload” large numbers of nuclear warheads stems from America’s bomber fleet being off alert status, but has become less important in the post Cold War era. The fighter based platform increases deterrence because it is more flexible and increases nuclear use options at the disposal of the president. According to Lawrence Freedman, “This flexibility improves upon the concepts that Robert McNamara formulated in 1963 with SIOP 63 with respect to having flexible response options.”¹⁴² Trading heavy bombers for nuclear capable fighter aircraft does not harm deterrence.

The terrorist events of 9/11 demonstrated that non-state actors could infiltrate the land defenses of the United States. This led to a new age of war in which modern conventional weapons took precedence over strategic assets. America was vulnerable to an outside attack, and nuclear deterrence had no effect. Today’s strategic long-range bomber’s mission has shifted to accommodate more conventional missions in connection with the wars in Iraq and Afghanistan. To meet America’s growing requirement for continued air supremacy, advanced bombers are needed to fight future wars. Hard decisions and funding are needed before the super extended lifespan of the current bomber fleet ends and we are left without this vital capability. Non nuclear bombers will also have deterrence and strategic value.

The key to these decisions is to remove the nuclear delivery mission from the requirements of the new bomber. Nuclear deterrence can be effective for the United

¹³⁹ Kurt Guthe, *Tailored Deterrence Influencing states and groups of concern*, ed. Barry Schneider and Patrick Ellis, USAF Counterproliferation Center, (Second Edition, March 2012), 340.

¹⁴⁰ *Ibid.*, 340.

¹⁴¹ *Ibid.*, 341.

¹⁴² Lawrence Freedman, *The Evolution of Nuclear Strategy*, (New York: Palgrave Macmillan, 2003), 216.

States and its allies with only ICBMs and SLBMs.¹⁴³ Options are always useful, especially in a time of crisis, but strategy is about choices. With the increased knowledge that today's bombers are obsolete and in dire need of modernizing, policymakers should shift nuclear budgetary dollars that would go into modernizing the bomber fleet to sustaining the ICBMs and SLBM fleet. Nuclear deterrence is still a vital mission, as is conventional force projection. The demands on our resources make it essential to adopt a strategy that balances defense and deterrence with other national objectives.

¹⁴³ Johnson, "Triad, Dyad, Monad?" 27–28.

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