

TOWARDS A BALANCED U.S. NUCLEAR WEAPONS POLICY

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ABSTRACT

Nuclear weapons remain salient to international security and stability given their continued existence within the strategic context of interstate relations, as well as their continued proliferation to state actors and potentially to non-state actors. Since the end of the Cold War, the U.S. and Russia have dramatically reduced their nuclear arsenals; however, the U.S. and Russia today still have the large majority of the world's nuclear inventory, with thousands of nuclear weapons each and plans to maintain these large stockpiles. The central question of this study is – how does one reconcile the size and continued existence of the U.S. nuclear arsenal with U.S. nonproliferation policy and the U.S. commitment to pursue nuclear disarmament? This study's primary argument is that a nuclear-armed state can craft a weapons policy involving nuclear posture and force structure that balances the requirements of nuclear deterrence with nuclear nonproliferation objectives and eventual nuclear disarmament, and that the U.S. has imperfectly pursued such a balanced nuclear weapons policy since the end of the Cold War. This study's primary policy recommendations are that the U.S. nuclear arsenal can be reduced further and the U.S. can modify its nuclear posture to limit the role of nuclear weapons; such nuclear weapons policy changes that limit the mission and size of U.S. nuclear forces would demonstrate genuine commitment to nuclear nonproliferation and progress towards nuclear disarmament, while also maintaining a strategic deterrence capability for the foreseeable future. The pursuit of a balanced nuclear weapons policy will allow the U.S. to function as a genuine actor to positively influence the international nuclear environment towards a potentially nuclear-free world. Ultimately, global nuclear disarmament will likely require major developments within the international system, including the solving of the world's major security issues.

Chapter 1: INTRODUCTION

Nuclear weapons, while not as prominently studied as during the Cold War, remain salient to international security and stability given their continued existence within the strategic context of interstate relations, as well as their continued proliferation to state actors and potentially to non-state actors (Goldstein, 2000, p. 1-2; Waltz, 2013, p. 108; Nichols, 2014, p. xi, 5-6; Smith, 2014, p. 244-246; Lieber & Press, 2013, January, p. 5-8). At its height in the mid-1960s, the U.S. nuclear arsenal included well over 30,000 total weapons that could be delivered by a variety of strategic and tactical delivery vehicles (Kristensen & Norris, 2013, p. 78; Nichols, 2014, p. 4, 22, 94). By the mid-1970s, the Soviet Union had achieved a rough numerical parity with the U.S. in terms of numbers of nuclear weapons, and the Soviet arsenal would grow to a peak of approximately 40,000 weapons by the mid-1980s (Kristensen & Norris, 2013, p. 78). Since the 1970s, the U.S. and Russia have engaged in several bilateral nuclear arms control processes, beginning with the Strategic Arms Limitation Treaties (SALT, SALT II) and subsequently followed by agreements such as the Intermediate-Range Nuclear Forces Treaty (INF) and the Strategic Arms Reductions Treaties (START I, START II, New START), which have resulted in significant reductions of nuclear weapons (Council on Foreign Relations, 2014). The New START Treaty finalized in 2010 restricts deployed strategic nuclear forces to 1,550 weapons for both the U.S. and Russia (Zenko, 2010, p. vii, 3; Nichols, 2014, p. 4). Early in his first term, President Obama expressed public support for the Nuclear Non-Proliferation Treaty (NPT) and eventual nuclear disarmament, stating “clearly and with conviction America's commitment to seek the peace and security of a world without nuclear weapons,” while also stating “as long as these weapons exist, the United States will maintain a safe, secure and effective arsenal to deter any adversary, and guarantee that defense to our allies...” (White

House, 2009). Despite considerable cuts to nuclear arsenals from Cold War levels, the U.S and Russia today still have the large majority of the world's nuclear inventory, with thousands of nuclear weapons each and plans to maintain these large stockpiles (Kristensen & Norris, 2013, p. 75-79; Zenko, 2010, p. 3). In addition, a recent significant downturn in Russian relations with the U.S. and Europe over the conflicts in Ukraine and Syria could limit cooperation on nuclear issues and stall any future nuclear arms control agreements.

When examining the future of U.S. nuclear weapons policy, several questions readily present themselves: How much is enough? How many nuclear weapons does the U.S. actually need to maintain a strategic deterrent? What kinds of nuclear warheads and delivery vehicles should the U.S. maintain? What should be the mission and role for the U.S. nuclear arsenal? This leads to the central question of this study – how does one reconcile the size and continued existence of the U.S. nuclear arsenal with U.S. nonproliferation policy and the public and binding U.S. commitment under the NPT to pursue nuclear disarmament? This study's primary argument is that a nuclear-armed state can craft a weapons policy involving nuclear posture and force structure that balances the requirements of nuclear deterrence with nuclear nonproliferation objectives and eventual nuclear disarmament, and that the U.S. has imperfectly pursued such a balanced nuclear weapons policy since the end of the Cold War. This study's primary policy recommendations are that the U.S. nuclear arsenal can be reduced further and the U.S. can modify its nuclear posture to limit the role of nuclear weapons; such nuclear weapons policy changes that limit the mission and size of U.S. nuclear forces would demonstrate genuine commitment to nuclear nonproliferation and progress towards nuclear disarmament, while also maintaining a strategic deterrence capability for the foreseeable future. Furthermore, while a formal bilateral treaty with Russia on additional nuclear weapons reductions would be optimal,

the U.S. can afford to consider significant unilateral reductions of its nuclear arsenal without jeopardizing its security; clear U.S. leadership on nuclear reductions could yield multiple benefits, including setting the stage for future multilateral negotiations among other nuclear states (Zenko, 2010, p. 4-6, Daalder & Lodal, 2008; Nichols, 2014, p. 114-117). Overall, the U.S. can safely pursue a balanced nuclear weapons policy due to its conventional military superiority and overall position as the most powerful state in the international system; a state's perceived threat environment, as well as its available capabilities to counter such threats and ensure its security, are crucial variables in determining the feasibility of a balanced nuclear weapons policy. Given its generally favorable security environment, the U.S. is able to move to a more modest nuclear posture that focuses the role of nuclear weapons to dealing with nuclear threats, while relying primarily on its dominant conventional military capabilities to counter a spectrum of nonnuclear threats. The U.S. can consider unilateral reductions of its nuclear forces given the absolute power of nuclear weapons; put simply, the incredible destructiveness of nuclear weapons, along with their survivability and deliverability, means that a state does not require an overabundance of these weapons to deter an adversary, even one that has a larger nuclear arsenal. A smaller nuclear arsenal should also be easier to manage and secure, which can help reduce some of the inherent dangers of nuclear weapons. Timing is a key variable that allows for a balanced nuclear weapons policy to support both current deterrence requirements and future disarmament goals; states can maintain nuclear deterrent forces for the foreseeable future since the timeframe for global nuclear disarmament is distant and otherwise unclear. The challenge in the coming years and decades is to shape nuclear deterrence relationships in ways that are conducive to allowing for the future possibility of nuclear disarmament. The pursuit of a balanced nuclear weapons policy will allow the U.S. to function as a genuine actor to positively

influence the international nuclear environment towards a potentially nuclear-free world. Ultimately, global nuclear disarmament will likely require major developments within the international system, including the solving of the world's major security issues.

This study will begin with a review of the existing academic literature on nuclear weapons. Chapter two presents the case for nuclear weapons by discussing the benefits of nuclear weapons and the dangers of nuclear disarmament. Chapter three presents the case in favor of nuclear disarmament by reviewing arguments about the dangers, limitations, and potential irrelevance of nuclear weapons, as well as discussing what nuclear disarmament might look like and how disarmament could be instituted within the international system. Chapter four presents a theory for nuclear-armed states that balances between nuclear deterrence requirements, nonproliferation policy, and disarmament goals. Chapter five examines current U.S. nuclear weapons policy, providing options for nuclear posture adjustments and further nuclear arms reductions. Academic and policy debates on nuclear weapons often pit supporters of continued nuclear deterrence against nuclear disarmament advocates. Despite sharp disagreements on the future role of nuclear weapons within international relations, both sides likely agree on one point – nuclear “thinking” in the U.S. largely atrophied after the Cold War ended, and the U.S. national security establishment, academic community, and American people must re-engage on issues of nuclear strategy given the enduring challenges and dangers of nuclear weapons (Lieber & Press, 2013; Lieber & Press, 2013, January; Larsen & Kartchner, 2014, p. xix-xxv, 5, 144-145, 173-174, 189, 191-193, 211-213, 241, 244-246, 257-260, 263-264, 269-271; Nichols, 2014, p. xi, 5-12, 73; O’Hanlon, 2010, p. 33; Lifton, 2001, p. 25-27, 30; Roberts, 2016).

Key Concepts

This section will briefly identify and define several key concepts for this study.

Defense vs. Deterrence – Defense is a security strategy of preventing an enemy from successfully attacking a state’s territory or interests; a defending state traditionally provides for its defense through the building of conventional military forces, which are designed to physically counter any enemy attacks. In contrast, deterrence as a security strategy is focused on providing military capabilities to retaliate for enemy attacks; deterrence does not involve physically preventing a successful enemy attack. Deterrence seeks to influence an enemy to not attack by promising unacceptable punishment (Waltz, 2013, p. 5; George & Smoke, 1974, p. 20-21, Goldstein, 2000, p. 28-30). Waltz (2013) writes – “‘To deter’ means to stop people from doing something by frightening them... Deterrence is achieved not through the ability to defend but through the ability to punish. Purely deterrent forces provide no defense... Purely defensive forces provide no deterrence” (p. 5). Nuclear weapons are typically viewed as optimal for deterrence strategies due to their great destructiveness, which allows for the promise of unacceptable damage on any enemy, and the continuing reality that there is no reliable means to physically defend against them (George & Smoke, 1974, p. 20-21; Goldstein, 2000, p. 28).

Defensive Realism vs. Offensive Realism – Defensive realism and offensive realism are two theories within the realist school of thought. Defensive realism, also known as structural realism, originated with the late Kenneth Waltz; offensive realism was created by John Mearsheimer (Mearsheimer, 2014, p. 4-5, 19). Defensive and offensive realism share the beliefs that states are the most important actors within the international system and that the anarchic

structure of international politics drives states behavior, focusing their efforts to ensure their security (Mearsheimer, 2014, p. 17-22). However, while defensive realists such as Waltz emphasize that states act conservatively to preserve their power and the overall balance of power, offensive realism asserts that states, especially major powers, will act aggressively to gain as much power as is feasible in order to ensure the most favorable position in the international system – “survival mandates aggressive behavior” (Mearsheimer, 2014, p. 17-22).

Nuclear Nonproliferation Treaty (NPT) – The NPT instituted in 1970 is a key component of the global nuclear nonproliferation regime. In exchange for promising to not build nuclear weapons, the nonnuclear states under the NPT are allowed to develop a nuclear energy capability. The NPT recognizes only five nuclear weapon states, the U.S., Russia, China, Britain, and France, which are allowed to possess nuclear arsenals. Of note, Article VI of the NPT states that treaty members should “pursue negotiations in good faith” towards the goal of nuclear disarmament. With regards to the world’s other nuclear-armed states, North Korea withdrew from the NPT in 2003, and India, Pakistan, and Israel are not members of the NPT (Lettow, 2010, p. 6-7).

Organization Theory – Unlike realism’s view of states as rational, unitary actors, organization theory emphasizes that entities within a state have a significant role in shaping state behavior within the international system. As described by Allison and Halperin (1972), “the ‘maker’ of government policy is not one calculating decision-maker, but rather a conglomerate of large organizations and political actors who differ substantially about what their government should do on any particular issue and who compete in attempting to affect both government decisions and the actions of their government” (p. 42). Organizations have limited rationality and will develop

organizational routines that may not always be operationally sound or optimal. Organizations such as the military and government agencies invariably have bureaucratic biases and will narrowly pursue their parochial interests, even if such efforts are not necessarily beneficial to the state; organizations also have internal components that will pursue their own interests (Sagan, 2013, p. 45-47).

A REVIEW OF THE ACADEMIC LITERATURE ON NUCLEAR WEAPONS

Chapter 2: The Case for Nuclear Weapons – the Benefits of Nuclear Weapons and the Dangers of Nuclear Disarmament

This chapter will review the existing academic literature that discusses the historical and current benefits of nuclear weapons, as well as the possible dangers of nuclear disarmament.

The following sections will discuss the security benefits of nuclear weapons through deterrence strategies, the domestic political benefits of nuclear weapons, the evolution of international norms regarding nuclear weapons possession, and potential pitfalls to nuclear disarmament.

The Security Benefits of Nuclear Weapons Through Deterrence Strategies

The traditional explanation for why states develop nuclear weapons focuses on the ability of nuclear weapons to ensure a state's security and survival by deterring major threats from adversaries; Sagan (1996/1997) refers to this as the security model, which is generally drawn from the realist school of thought (Sagan, 1996/1997, p. 54, 57-63; Ganguly & Hagerty, 2005, p. 120; Yoshihara & Holmes, 2012, p. 236; Waltz, 2013, p. 4-6, 27-28, 37; Goldstein, 2000, p. 255-256, 297). The international system's anarchic nature is a core principle of realism, compelling states to look out for their own security and leading some states to pursue independent nuclear deterrents (Waltz, 2013, p. 4-5; Goldstein, 2000, p. 1, 13, 21). Bernard Brodie articulated the essential notion of nuclear deterrence in 1946: "Thus far the chief purpose of our military establishment has been to win wars. From now on its chief purpose must be to avert them. It can have almost no other purpose" (as cited in Jervis, 1989, p. 7; as cited in Rovner, 2012, p. 17; as cited in Foerster, 2014, p. 191). While nuclear deterrence strategies most often focus on threats posed by nuclear-armed adversaries, states may attempt to use their nuclear weapons to deter any

major attacks, whether they be nuclear strikes, major conventional assaults or invasions, or attacks using chemical and biological weapons (Waltz, 2013, p. 24, 28, 105-107; Narang, 2014; Sagan, 1996/1997, p. 54, 57; Nichols, 2014; Goldstein, 2000). A number of scholars have noted that debates on nuclear deterrence strategies are invariably theoretical given the non-use of nuclear weapons since World War II (Jervis, 1986, p. 699; Jervis, 1989, p. 182; Narang, 2014, p. 226, 231, 306; Hagerty, 1998, p. 37).

Relative Comparisons of Nuclear Capabilities, the Cold War, and Mutually Assured Destruction

The majority of the academic literature on nuclear weapons is unsurprisingly based on the experiences of the superpowers during the Cold War (1945-1991) (Goldstein, 2000, p. 8-9; Narang, 2014, p. 1-3; Nichols, 2014, p. 5-6). A centerpiece of the competition between the U.S. and Soviet Union involved a nuclear arms race that produced enormous arsenals on both sides and extensive debates on nuclear strategy (Narang, 2014, p. 5; Sagan, 1989, p. 10-57; Nichols, 2014, p. 16-43; Mearsheimer, 2014, p. 224-232). Narang (2014) notes that a number of Western Cold War strategists argued for “maximalist nuclear postures” that supported the buildup of a large and diverse U.S. nuclear arsenal as necessary in order to deter the Soviet Union (p. 5). Strategists such as Paul Nitze and Colin Gray argued that victory in nuclear war was theoretically possible and relative comparisons of superpower nuclear capabilities mattered for both peacetime deterrence and the overall distribution of power within the international system (Jervis, 1989, p. 15-18; Goldstein, 2000, p. 42-43). In the mid-1950s, Nitze wrote that victory in a nuclear war could entail a “comparison of the postwar position of one of the adversaries with the postwar position of the other adversary. In this sense it is quite possible that in a general nuclear war one side or the other could ‘win’ decisively” and emphasized “the utmost

importance that the West maintain a sufficient margin of superior capability so that if general war were to occur we could ‘win’... The greater that margin (and the more clearly the Communists understand that we have a margin), the less likely it is that nuclear war will ever occur” (Nitze, 1956, p. 190-191; Jervis, 1989, p. 16). Colin Gray asserts that successful deterrence of the Soviet Union “translates with little difficulty into the requirement for a theory of a victory” (as cited in Jervis, 1989, p. 18). Nichols (2014) states “thinkers such as Herman Kahn insisted that Americans had to move past denial and anger, and reach acceptance of the nuclear age. This process entailed calmly thinking through horrific scenarios in which millions of people would die and entire nations would be pulverized” (p. 21). Nichols (2014) describes how the traditional logic of relative power comparison influenced U.S. military planning during the Cold War:

U.S. nuclear analysts kept raising the level of weapons at which this notional deterrence was triggered as both sides relentlessly produced yet more nuclear arms... In the early 1950s, the Joint Chiefs of Staff told Eisenhower that the Soviet Union could be defeated with 70 nuclear strikes. In 1959, the Navy came up with its figure of 232. In 1960, a special committee led by Army General Thomas Hickey produced a list consisting of 2,021 Soviet bloc targets, including every military asset of any appreciable value and more than a hundred targets in urban areas. As new weapons were built, the military identified more targets, which in turn created a circular pressure for more weapons to serve the expanded target sets... By 1965, the total U.S. nuclear inventory numbered more than 30,000 weapons. (p. 94)

In terms of nuclear inventory, the U.S. would enjoy a significant numerical lead over the Soviet Union until at least the early 1960s, and the Eisenhower-era U.S. nuclear doctrine of “massive

retaliation” involved relatively unconstrained war plans calling for the maximum employment of nuclear weapons to destroy Soviet urban-industrial centers (“countervalue” targeting) and the Soviet military, including its nuclear forces (“counterforce” targeting) (Sagan, 1989, p. 11, 18-27; Colby, 2014, p. 50-51; Nichols, 2014, p. 18-19; Mearsheimer, 2014, p. 225; Lieber & Press, 2006, March/April, p. 44; Lieber & Press, 2006, p. 32-33). U.S. nuclear strategy was meant to deter Soviet nuclear attack against the U.S. and its allies, as well as deter Soviet conventional military aggression against Western Europe; however, should deterrence appear to falter, U.S. nuclear preemption was considered a valid option in order to limit damage to the U.S. homeland (Sagan, 1989, p. 19-24; Colby, 2014, p. 50-51; Mearsheimer, 2014, p. 225-226; Lieber & Press, 2006, March/April, p. 44; Lieber & Press, 2006, p. 33). Sagan (1989) and Colby (2014) note that an early 1960s U.S. nuclear war plan, known as the Single Integrated Operational Plan 62 (SIOP-62), was very inflexible, calling for the use of thousands of nuclear warheads against the Soviet Union and its allies in Europe and Asia (Sagan, 1989, p. 24-27; Colby, 2014, p. 51). However, as the Soviet Union began to expand the size of its nuclear arsenal, it became clear that a full-fledged nuclear war would likely result in catastrophic damage to both superpowers; the nuclear relationship between the superpowers became one of a shared vulnerability referred to as Mutual Assured Destruction (MAD). MAD is essentially a situation where each side retains the ability to destroy the other, regardless of who strikes first; the notion of conducting a massive, “disarming” nuclear first strike is largely unrealistic. Given the stark reality that MAD made the prospects of a full-scale nuclear war extremely risky and costly, the U.S., starting with the Kennedy administration, began to explore potential “limited nuclear options.” Such efforts were due to a general desire to give U.S. presidents proportional nuclear employment options in case of limited Soviet nuclear attacks, but were also meant to buttress the credibility of U.S. extended

nuclear deterrence guarantees to its allies that threatened the first use of nuclear weapons to counter a Soviet conventional military invasion of Western Europe (Sagan, 1989, p. 26-44; Colby, 2014, p. 51-53, 65-68; Nichols, 2014, p. 22-32; Mearsheimer, 2014, p. 228). Despite the subsequent support by several U.S. administrations for more flexible nuclear options, the U.S. military would not develop viable operational plans involving the limited use of nuclear weapons until the mid-1980s, and U.S. nuclear war plans retained large strike options throughout the Cold War (Colby, 2014, p. 51-67; Sagan, 1989, p. 39-57). In the end it is impossible to know whether a limited nuclear war between the superpowers would have been feasible, or whether the reality of MAD and the uncertain dynamics of a nuclear war would have resulted in escalation involving the use of thousands of nuclear weapons and enormous destruction for both superpowers and their allies (Nichols, 2014, p. 20-22, 30-31).

Defensive Realism, the Absolute Power of Nuclear Weapons, and Small Nuclear Forces

With the experience of the Cold War, a number of scholars have generally concluded that nuclear weapons were likely a key factor in mutually deterring war between the superpowers and provide a similar security benefit for contemporary nuclear states (Waltz, 2013, p. 4, 40, 108-109; Jervis, 1989, p. 23-27; Jervis, 1988, p. 80-81, 83-85, 87, 90; Jervis, 1986, p. 690, 694, 702-703; Jervis, 1979/1980, p. 617-619, 633; Gaddis, 1986, p. 120-123; Van Evera, 1990/1991, p. 12-13; Mearsheimer, 2014, p. 128-130, 131, 133, 146-147; Lieber & Press, 2006, p. 7; Goldstein, 2000, p. 288; Hagerty, 1998, p. 36). However, as noted by Narang (2014), some defensive realists question the excessiveness of the Cold War nuclear arms race and argue that much smaller nuclear arsenals are sufficient to maintain deterrence (Narang, 2014, p. 6; Mearsheimer, 2014, p. 19-22, 146). Kenneth Waltz and Robert Jervis are two of the most prominent scholars

for this school of thought (Narang, 2014, p. 6). In his well-known debate with Scott Sagan regarding the effects of nuclear proliferation, Waltz (2013) succinctly conveys several aspects of the security benefits of nuclear weapons (p. 3-40). Waltz (2013) notes that nuclear weapons have raised the costs and risks of war to unprecedented levels, inducing great caution between nuclear-armed states:

States are not likely to run major risks for minor gains. War between nuclear states may escalate as the loser uses larger and larger warheads. Fearing that, states will want to draw back. Not escalation, but de-escalation becomes likely. War remains possible, but victory in war is too dangerous to fight for... states act with less care if the expected costs of war are low and more care if they are high. In 1853 and 1854 Britain and France expected to win an easy victory if they went to war with Russia. The vagueness of their expectations was matched by the carelessness of their actions... In sharp contrast, the presence of nuclear weapons makes states exceedingly cautious. Think of Kennedy and Khrushchev in the Cuban missile crisis. Why fight if you can't win much and might lose everything? (p. 6-7)

Jervis stresses that the great destructiveness of nuclear weapons, along with shared vulnerability between the superpowers, means that “military victory in an all-out war is now impossible”; the “nuclear revolution” is in fact revolutionary since warfare as a means of settling political disputes between major powers has become an extremely risky and dangerous option (Jervis, 1989, p. 1, 4-9, 14-15, 46-47, 226, 230; Jervis, 1979/1980, p. 617-618; Jervis, 1984, p. 33-34, 39; Jervis, 1986, p. 690, 692; Jervis, 1988, p. 83-85). Jervis also emphasizes the persistent danger of escalation, both deliberate and “mutually undesired escalation,” works to bolster nuclear deterrence and causes nuclear armed states to act cautiously; the possibility of escalation works

against the “stability-instability paradox,” which is the notion that mutual nuclear deterrents could negate each other, allowing states to engage in conventional conflicts (Jervis, 1989, p. 19-22, 44-45, 51-52, 71, 118, 120, 230, 238-239, 255-256; Jervis, 1979/1980, p. 631; Jervis, 1984, p. 35, 38-39; Jervis, 1988, p. 81, 84, 87-88). Jervis criticizes U.S. Cold War deterrence strategies that included both the development of limited nuclear options and plans to fight a long nuclear war with expansive target lists as unrealistic and risky given the unavoidable danger of escalation (Jervis, 1979/1980, p. 621, 632; Jervis, 1984, p. 33-35, 39; Jervis, 1989, p. 68-69, 117-119, 218-221).

Nuclear weapons allow for deterrence by punishment strategies where a state can threaten to inflict major pain on an adversary without having to neutralize the adversary’s military forces, even if that adversary is winning a conventional conflict (Waltz, 2013, p. 5, 33; Jervis, 1989, p. 9-10, 46-47; Jervis, 1986, p. 690). Waltz (2013) argues that a nuclear deterrent reduces the need for “strategic depth” in territory that is traditionally required for defensive strategies involving conventional military forces (p. 7, 32). Unlike conventional weapon systems, nuclear weapons, especially those delivered on ballistic missiles, do not typically engage in battle against each other, which means that technological advancements in one state’s nuclear weapons do not automatically negate the effectiveness of another state’s nuclear weapons (Waltz, 2013, p. 7-8). Waltz (2013) also argues that nuclear weapons serve as a stabilizing factor for deterrence within an international system that shifts from a bipolar structure to a multipolar structure (p. 14-15). Even though the exact costs of a nuclear war are unknowable, Waltz (2013) argues that nuclear weapons provide a stark clarity regarding the calculations of war that conventional weapons do not:

Miscalculation causes wars... Here the differences between conventional and nuclear worlds are fundamental. In the former, states are too often tempted to act on advantages that are wishfully discerned and narrowly calculated... In a conventional world, one is uncertain about winning or losing. In a nuclear world, one is uncertain about surviving or being annihilated... That prediction is easy to make because it does not require close estimates of opposing forces. The number of one's cities that can be severely damaged is equal to the number of strategic warheads an adversary can deliver... Do we expect to lose one city or two, two cities or ten? When these are the pertinent questions, we stop thinking about running risks and start worrying about how to avoid them... Nuclear weapons make military miscalculation difficult and politically pertinent prediction easy.

(p. 8-9)

An explicit assumption in Waltz's arguments is that all state leaders, regardless of domestic political characteristics, are rational enough to understand the implications of using nuclear weapons: "Rulers want to have a country that they can continue to rule" (Waltz, 2013, p. 13-14). Waltz (2013) notes a limitation regarding nuclear deterrence in that while nuclear weapons are well suited to protect a state's vital interests, nuclear weapons do not work well for protecting peripheral security interests (p. 16, 24-26). In this way, nuclear weapons serve an important but restricted role as the ultimate option to provide for the continued existence of a state: "Use of nuclear weapons by lesser states, or by any state, will come only if survival is at stake... no country will press a nuclear nation to the point of decisive defeat. In the desperation of defeat, desperate measures may be taken, and the last thing anyone wants to do is make a nuclear nation desperate. The unconditional surrender of a nuclear nation cannot be demanded" (Waltz, 2013, p. 27-28). However, Jervis acknowledges dangers do exist when states wishing to change the status

quo choose to use force despite the presence of nuclear weapons; limited conflicts between nuclear states such as the Soviet-Chinese border conflict in the late 1960s and severe conventional attacks against nuclear states such as what Israel experienced during the 1973 Yom Kippur war have occurred and remain possible (Jervis, 1989, p. 28-29; Jervis, 1988, p. 82, 89).

In contrast to the Cold War strategists who focused on relative comparisons of nuclear forces and argued for a large U.S. nuclear arsenal, Waltz emphasizes the utility of small nuclear forces, arguing that the absolute power of nuclear weapons to inflict unacceptable damage on an adversary is central to nuclear deterrence (Waltz, 2013, p. 17-32, 39-40, 98-100, 108, 110-111). Waltz's requirement for deterrence is that a state possess a second strike nuclear capability, which entails robust command and control over a flexible nuclear force that can survive an enemy first strike with enough weapons to allow for retaliation at a time of the state's choosing (Waltz, 2013, p. 20). Jervis also notes that a "mutual second-strike capability" is required for nuclear deterrence (Jervis, 1989, p. 9, 15, 45; Jervis, 1988, p. 89). Waltz (2013) argues that small nuclear forces can successfully fulfill such a deterrent role: the compact physical dimensions of nuclear weapons make it relatively easy to ensure their survivability and deliverability; the great destructiveness of nuclear weapons means that even if only a few weapons survive a first strike, that is sufficient to inflict significant damage on an adversary; robust command and control is not hard with small nuclear forces, and is certainly easier than managing a larger nuclear force (p. 19-21, 110-111). While acknowledging the history of preventive attacks on state nuclear programs such as the Israeli strike against the Iraqi nuclear program in 1981, Waltz argues that preventive attacks against state nuclear weapons programs are very risky and at best will only temporarily setback a state's nuclear ambitions; in the long term, such attacks may serve only to bolster a state's determination to acquire nuclear weapons

(Waltz, 2013, p. 17-19; Waltz, 2012, p. 3). Preemptive strikes against a new nuclear state's budding nuclear forces are even riskier; a less-than-perfect strike that left only a few nuclear weapons intact would allow the possibility for the attacked state to retaliate and inflict heavy damage on the attacker (Waltz, 2013, p. 19-20). Waltz (2013) emphasizes that only a modest retaliatory capability is required for deterrence and that U.S. deterrence calculations during the Cold War were grossly inflated (p. 20-22, 99). Waltz (2013) even argues that a state's retaliatory capability need not be guaranteed: "A low probability of carrying a highly destructive attack home is sufficient for deterrence... In a nuclear world, a would-be attacker is deterred if it believes that the attacked may retaliate. Uncertainty of response, not certainty, is required for deterrence because, if retaliation occurs, one risks losing so much" (p. 22-24). Jervis echoes this point regarding the level of credibility and certainty of nuclear retaliation: "nuclear threats may not have to be highly credible in order to be highly effective. Even a slight chance that a provocation could lead to nuclear war will be sufficient to deter all but the most highly motivated adversaries" (Jervis, 1989, p. 38; Jervis, 1986, p. 696-697). Waltz (2013) states that the absolute power of nuclear weapons is key while relative comparisons of nuclear forces are largely unimportant: "With deterrent forces, the question is not whether one country has more than another but whether it has the capability of inflicting 'unacceptable damage' on another, with 'unacceptable' sensibly defined. Given second-strike capabilities, it is not the balance of forces but the possibility that they may be used that counts... Second-strike forces have to be seen in absolute terms" (p. 24). Jervis agrees that the absolute capability to execute a retaliatory strike is much more important than the relative balance of nuclear arsenals (Jervis, 1979/1980, p. 618; Jervis, 1989, p. 18). Waltz (2013) concludes that small nuclear forces allow relatively weak

states to effectively deter more powerful adversaries and make nuclear and conventional arms races unnecessary (p. 21-22, 28-32).

To illustrate the deterrence benefits of nuclear weapons, Waltz (2013) states that the U.S. pursues nuclear nonproliferation and ballistic missile defenses primarily out of a desire to maintain its freedom of action to utilize its conventional military superiority (p. 100, 105-107). Waltz (2013) writes “A big reason for America’s resistance to the spread of nuclear weapons is that if weak countries have some they will cramp our style. Militarily punishing small countries for behavior we dislike would become much more perilous... we want to be able to intervene militarily whenever and wherever we choose. Our nuclear defenses would presumably make that possible even against countries lightly armed with nuclear weapons” (p. 100, 105). Waltz quotes a statement from Les Aspin: “A world without nuclear weapons would not be disadvantageous to the United States. In fact, a world without nuclear weapons would actually be better. Nuclear weapons are still the big equalizer, but now the United States is not the equalizer but the equalizee” (as cited in Waltz, 2013, p. 107). Waltz (2013) criticizes the pursuit of ballistic missile defenses, questioning the feasibility and effectiveness of such defenses, while also emphasizing the detrimental impact on nuclear deterrence relationships (p. 101-103). The most significant negative impact is that U.S. ballistic missile defenses will likely spur an increase in nuclear arsenals, since other nuclear powers such as Russia and China can increase their numbers of deployed nuclear weapons and ballistic missiles in order to overcome any missile defenses and preserve their nuclear deterrent (Waltz, 2013, p. 103-107). Waltz (2013) also notes that nuclear states can employ technical countermeasures such as decoy warheads to stymie ballistic missile defenses and utilize alternative delivery vehicles such as cruise missiles for nuclear attacks (p. 104). Waltz (2013) suggests the abandonment of ballistic missile defenses, coupled

with the continued movement by the U.S. and Russia towards smaller nuclear forces and reductions in nuclear force alert status, would allow for both maximizing the utility of nuclear weapons and minimizing their risk (p. 108, 110-111).

Existential Nuclear Deterrence and Minimal Nuclear Forces

As noted by Lieber and Press (2006), other realist scholars such as Avery Goldstein and Devin Hagerty depart slightly from Waltz and Jervis by asserting that deterrence does not depend on a second strike nuclear capability and that the simple acquisition of a small nuclear arsenal is enough to deter major attacks (Lieber & Press, 2006, p. 37-38; Goldstein, 2000, p. 4; Hagerty, 1998, p. 26). In his study of the nuclear weapons programs of China, France, and Britain, Goldstein (2000) finds that nuclear weapons provided these states with an enduring, independent, and relatively cost-effective option to ensure their security by deterring a stronger superpower adversary; despite the end of the Cold War, nuclear deterrence continues to be a key component of the national security strategies for each of these states (p. 2-4, 15-17, 32-33, 41-44, 52-57, 115-119, 140-154, 157-160, 181-202, 226-247, 266, 297-298). However, Goldstein (2000) notes that the nuclear arsenals of China, France, and Britain were much smaller than those of the superpowers, and that China's arsenal was generally vulnerable throughout the Cold War (p. 119-129, 173-178, 204-210). Goldstein argues that a modest nuclear capability works for China, France, and Britain since deterrence is attained by "first-strike uncertainty," which Hagerty defines as the "planting of a seed of doubt in the minds of the potential attacker's leaders about whether it would be possible to destroy all of the opponent's nuclear weapons preemptively" (Hagerty, 1998, p. 26; Goldstein, 2000, p. 44-46). Goldstein does agree with Jervis by emphasizing the danger of escalation, including "uncontrollable nuclear escalation" (Goldstein,

2000, p. 48-49). Goldstein (2000) describes how escalation is possible in a crisis given that a small nuclear state could become an “unsafe actor” in which a nuclear accident might become technically more likely or whose leaders may become increasingly unpredictable and irrational (p. 48-52).

Offensive Realism, Nuclear Superiority, and Modernization

John Mearsheimer offers a critique of the defensive realists’ interpretation of the nuclear revolution using his theory of offensive realism. Defensive and offensive realism share the belief that the anarchic structure of international politics drives states behavior, focusing their efforts to ensure their security (Mearsheimer, 2014, p. 17-22). However, while defensive realists such as Waltz emphasize that states act conservatively to preserve their power and the overall balance of power, offensive realism asserts that states, especially major powers, will act aggressively to gain as much power as is feasible in order to ensure the most favorable position in the international system – “survival mandates aggressive behavior” (Mearsheimer, 2014, p. 17-22). While Waltz and Jervis argue that conventional force levels are much less important between nuclear-armed states since the danger of nuclear escalation greatly reduces the probability of conflict, Mearsheimer argues that even though escalation to nuclear conflict is possible, it is by no means guaranteed and that conventional military power still matters, especially ground force capabilities – “it is possible that a nuclear-armed great power might conclude that it could fight a conventional war against a nuclear-armed rival without the war turning nuclear, especially if the attacking power kept its goals limited and did not threaten to decisively defeat its opponent” (Mearsheimer, 2014, p. 130-133). Mearsheimer (2014) highlights the concept of nuclear superiority and the security advantage it would provide a major

power – “nuclear superiority exists when a great power has the capability to destroy an adversary’s society without fear of major retaliation against its own society... Any state that achieves nuclear superiority over its rivals effectively becomes the only great power in the system, because the power advantage bestowed on that state would be tremendous... Every great power would like to achieve nuclear superiority, but it is not likely to happen often...” (p. 128-130). In contrast to the defensive realists’ view of the Cold war nuclear arms race as excessive and unnecessary, Mearsheimer (2014) argues it was rational for the superpowers to engage in nuclear competition, building massive and diverse arsenals; each side attempted to achieve nuclear superiority, despite the improbability of success, and certainly each superpower wanted to ensure the other side did not achieve nuclear superiority (p. 224-232). In addition, Mearsheimer (2014) points out that the nuclear arms race was underpinned by constant advances in technology that could possibly have allowed for the achievement of nuclear superiority; the imperative to stay ahead technologically is reflected in the history of U.S. efforts to increase the effectiveness and capabilities of its nuclear weapons, as well as in its efforts to develop ballistic missile defenses (p. 227-232).

Keir Lieber and Daryl Press argue the modern characteristics and challenges involving nuclear weapons require the U.S. national security establishment and academic community to re-engage on issues of nuclear strategy (Lieber & Press, 2013; Lieber & Press, 2013, January). Technological advancements in precision-guided weapons systems now allow for more effective counterforce strikes than in the past, using both conventional and nuclear warheads; the improvement in counterforce capabilities could increase the vulnerability of nuclear deterrent forces, especially small nuclear forces (Lieber & Press, 2013, p. 3-5, 11; Lieber & Press, 2006, p. 9, 22, 26, 28-29, 34; Lieber & Press, 2006, March/April, p. 45-51; Lieber & Press, 2009, p. 45-

47). In addition, the increased accuracy of modern delivery systems means that counterforce strikes could entail relatively low-yield nuclear warheads configured as airbursts, resulting in significantly less radioactive fallout and casualties than what was projected in Cold War-era counterforce strike scenarios (Lieber & Press, 2013, p. 4, 13; Lieber & Press, 2013, January, p. 14-15; Lieber & Press, 2009, p. 46-47; Bennett, 2014, p. 234). Lieber and Press (2013) argue that the U.S. is working to achieve “strategic primacy,” an ability to counter other states’ nuclear forces using a broad range of military capabilities (p. 5, 8-9). “Strategic primacy” would provide a powerful state such as the U.S. with possible options to deal with an adversary’s potential threat of asymmetric nuclear escalation.

Nuclear Posture – the Utility of Asymmetric Nuclear Escalation to Deter Conventional Attack

In his study of regional nuclear states, Vipin Narang emphasizes the importance of a state’s nuclear posture in determining the ability of nuclear weapons to deter conventional attack (Narang, 2014, p. 2-5, 10-12, 23, 26, 230, 248, 251, 298-299, 307-308, 311). Narang (2014) states a “Cold War hangover” centered on the superpowers still dominates existing academic debates on nuclear weapons, with too little attention paid to the different nuclear experiences of other nuclear states (p. 2-3, 6, 225). Narang (2014) also states the academic literature that does examine regional nuclear states has an “acquisition bias” in that most studies concentrate on the dynamics of state nuclear proliferation, with little work examining how regional nuclear states plan to employ their nuclear weapons (p. 3, 6-7, 23-26, 224-228, 299, 307). Narang (2014) defines nuclear posture as

the incorporation of some number and type of nuclear warheads and delivery vehicles into a state’s overall military structure, the rules and procedures governing how those

weapons are deployed, when and under what conditions they might be used, against what targets, and who has the authority to make those decisions. Nuclear posture is best thought of as the operational, rather than the declaratory, nuclear doctrine of a country; while the two can overlap, it is the operational doctrine that generates deterrent power against an opponent. (p. 4)

A state's nuclear posture is determined by "its nuclear capabilities (does it have survivable forces and/or tactical nuclear weapons?), its command-and-control arrangements (is control pre-delegated or assertive and centralized?), the level of transparency regarding capabilities and deployment patterns, and finally, the envisioned use and orientation of a state's nuclear arsenal" (Narang, 2014, p. 21). Narang (2014) argues

The stickiness of the capabilities and organizational inputs that define a state's nuclear posture has two virtues. First, it reduces measurement uncertainty. We can be confident that peacetime postures are both accurate *and* effectively capture what a state has available to deploy and employ should a conflict occur. A state that physically lacks tactical nuclear weapons or survivable second-strike forces, or the organizations to employ them as such, cannot develop them in the time frame of a crisis or conflict... A state may operationalize its posture in a conflict or crisis, but it cannot easily *change* its posture... Second, in practice, it means that regional powers adopt *one* of these postures, and adopt the same posture toward *all* of their potential opponents. (p. 21)

Narang's review of regional nuclear states yields "three analytically distinct and identifiable nuclear postures: a *catalytic* strategy that attempts to catalyze superpower intervention on the state's behalf; an *assured retaliation* strategy that threatens certain nuclear retaliation in the event a state suffers a nuclear attack; and an *asymmetric escalation* strategy that

threatens the first use of nuclear weapons against conventional attacks” (Narang, 2014, p. 4, 15-21). The catalytic strategy “primarily envisions ‘catalyzing’ third-party—often American—military or diplomatic assistance when a state’s vital interests are threatened. It can do so by threatening to break out known nuclear weapons capabilities or previously ambiguous or non-operational nuclear capabilities and escalate a conflict if assistance is not forthcoming” (Narang, 2014, p. 15). The catalytic nuclear posture only requires rudimentary nuclear capabilities that do not necessarily have to be survivable and are usually centrally controlled; Israel, South Africa, and Pakistan have utilized the catalytic posture in the past (Narang, 2014, p. 16-17, 22). The assured retaliation posture is configured to deter nuclear attack by “threatening an opponent with certain nuclear retaliation even after sustaining damage” and typically requires a secure, second-strike capability that is centrally controlled (Narang, 2014, p. 17, 22). While the catalytic nuclear posture typically involves a low level of transparency, the assured retaliation posture involves clear and visible nuclear capabilities; currently, states such as China and India employ assured retaliation postures (Narang, 2014, p. 17-19, 22). Narang (2014) states “The asymmetric escalation posture is explicitly designed to deter conventional attacks by enabling a state to respond with rapid, asymmetric escalation to first use of nuclear weapons against military and/or civilian targets” (p. 19). Asymmetric nuclear escalation typically requires nuclear forces capable of being utilized in battlefield or tactical scenarios and relaxed command-and-control structures; currently, states such as France and Pakistan employ asymmetric nuclear escalation strategies (Narang, 2014, p. 19-20, 22).

Narang (2014) offers a new “Posture Optimization Theory” to explain a regional nuclear state’s choice of nuclear strategy; with nuclear posture as the dependent variable, this theory’s independent variables include the “availability of a third-party patron,” a state’s security threats,

the relationship between the civilian and military leadership of a state, and state resources available for a nuclear weapons program (p. 8-9, 13, 27- 46). As examples, Narang (2014) demonstrates how his theory works well to explain why regional nuclear states such as China and India have chosen assured retaliation postures, while other nuclear states such as Pakistan and France have utilized asymmetric escalation postures (p. 8-9, 22, 25, 32, 53, 302-303). Narang (2014) utilizes both a large-n quantitative study and qualitative case studies to examine the deterrence benefits of each nuclear posture, concluding that the asymmetric nuclear escalation strategy works best to deter conventional attack, while the assured retaliation and catalytic postures performed relatively poorly (p. 10-12, 222-225, 231-236, 246, 249-251, 281-282, 291-292, 295-298, 300, 306). Narang's conclusion regarding the efficacy of asymmetric nuclear escalation in deterring conventional attack has implications for nuclear nonproliferation and disarmament that will be discussed in chapter four of this study, and highlights the challenges a powerful state such as the U.S. faces in potential confrontations with other nuclear states, which will be discussed in chapter five.

The Domestic Political Benefits of Nuclear Weapons

Sagan (1996/1997) presents a "Domestic Politics Model" that points to entities within a state who may benefit from a nuclear weapons program; examples of domestic actors would include political figures, the military, and nuclear scientists (p. 63-64). Sagan (1996/1997) describes how these domestic players can ally with each other to internally build a government's support for a nuclear weapons program (p. 64). With the domestic politics model, "bureaucratic actors are not seen as passive recipients of top-down political decisions; instead, they create the conditions that favor weapons acquisition by encouraging extreme perceptions of foreign threats,

promoting supportive politicians, and actively lobbying for increased defense spending” (Sagan, 1996/1997, p. 64). Sagan (1996/1997) argues the Indian nuclear weapons program is a good example that shows the domestic influences on nuclear proliferation (p. 65). Indian domestic actors who supported a nuclear weapons effort struggled for years against other Indian domestic figures who advocated for India to remain non-nuclear (Sagan, 1996/1997, p. 66). Sagan (1996/1997) argues that domestic political interests were the primary driver behind Indian Prime Minister Gandhi’s decision to conduct a nuclear test in 1974 (p. 67-68). The 1974 nuclear test was very popular with the Indian people and significantly bolstered Prime Minister Gandhi’s domestic political standing, which had been hurt at the time by domestic unrest, political factionalism, and ongoing economic problems (Sagan, 1996/1997, p. 67-68). Bajpai (2009) argues that India’s 1998 nuclear tests are also best explained by domestic political calculations; these tests were conducted shortly after the rise to power of the Bharatiya Janata Party (BJP), a pro-nuclear, Indian nationalist party that rallied its domestic support using “a strategic culture of national power and status” (p. 35-39). Bajpai (2009) describes how the 1998 nuclear tests were very popular domestically and provided tangible domestic political benefits for the BJP and its leader, Prime Minister Atal Behari Vajpayee (p. 39-53).

The Evolution of International Norms and Nuclear Weapons Possession – From Prestige Benefit to Reputational Cost

Sagan (1996/1997) also presents a “Norms Model” where states view nuclear weapons as providing symbolic benefits of national prestige, independence, and modernity (p. 73-76). In the norms model, “military organizations and their weapons can therefore be envisioned as serving functions similar to those of flags, airlines, and Olympic teams: they are part of what modern

states believe they have to possess to be legitimate, modern states” (Sagan, 1996/1997, p. 74).

Sagan (1996/1997) argues that the notion of national greatness was a prime motivation for the French nuclear weapons program, with Charles de Gaulle as a key advocate (p. 78-79).

De Gaulle commented in 1959 that “A France without world responsibility would be unworthy of herself, especially in the eyes of Frenchmen... she intends to provide herself with an atomic armament. Only in this way can our defense and foreign policy be independent, which we prize

above everything else” (as cited in Sagan, 1996/1997, p. 79). Even though Goldstein (2000)

argues security interests were the primary reason for the French, British, and Chinese nuclear programs, he acknowledges that a desire for prestige was a secondary factor (p. 115-119, 157,

194-199, 271-272). Both Goldstein and Sagan note how the NPT regime has changed

international norms involving nuclear weapons, with Sagan describing Ukraine’s 1990s nuclear

disarmament decision as reflective of this normative change; whereas nuclear weapons were seen

as prestigious in the 1950s as France was developing its nuclear capability, by the time Ukraine

inherited nuclear weapons with the end of the Cold War in 1991, nuclear proliferation was now

viewed as a prohibited state behavior, with a negative effect on national prestige (Goldstein,

2000, p. 271, Sagan, 1996/1997, p. 76, 80-82). In addition to norms that discourage the

possession of nuclear weapons, other norms have developed against the actual use of nuclear

weapons and will be discussed in chapter three of this study.

Dangers of Nuclear Disarmament – Issues with Feasibility and Desirability

Scholars who tout the benefits of nuclear weapons will often also address problems involving the idea of nuclear disarmament. Waltz (2013), Goldstein (2000), and O’Hanlon (2010) address concerns regarding nuclear disarmament, focusing on issues of feasibility and

desirability. Verification of any international nuclear weapons ban would be challenging and there would be an enduring danger of states clandestinely maintaining a nuclear weapons capability, especially given the realities that nuclear weapons and fissile materials cannot be un-invented and are relatively easy to conceal (Waltz, 2013, p. 223; Goldstein, 2000, p. 294-295, O’Hanlon, 2010, p. 49-55). Goldstein (2000) writes “Even if a verification regime could be negotiated, fears about its possible imperfections would provide strong incentives for a sub-rosa security dilemma to play itself out, in which even states valuing the treaty would believe it necessary to hedge their bets by hiding a fallback deterrent against small-scale cheating” (p. 294). Moreover, even if enforcement of a nuclear weapons ban were somehow feasible, both Waltz (2013) and Goldstein (2000) question the wisdom of a nuclear-free world. An international system without nuclear weapons would likely see the return of major wars between great powers, a phenomena that was prevalent before 1945 (Waltz, 2013, p. 220-221; Goldstein, 2000, p. 294-295). Waltz (2013) asserts nuclear disarmament “would, among other things, make the world safe for the fighting of World War III” and that from an international perspective, the danger would be a dominant U.S. free to utilize its conventional military superiority (p. 221, 224). Goldstein (2000) warns that a nuclear-free world could lead to conventional arms buildups – “States would see a need to bolster their conventional capabilities to compensate for the lost dissuasive effects of the nuclear deterrent they had forsaken” (p. 294). In addition, should a major conventional war occur in a nuclear-free world, the escalatory dangers towards renuclearization could be significant – “Once hostilities had erupted, confidence in the verification regime that undergirded the disarmament treaty would likely plummet. Fearing the consequences of unreciprocated self-restraint, adversaries would have strong incentives to reconstitute a nuclear capability, if only as a deterrent” (Goldstein, 2000, p. 295). Given these

issues with feasibility and desirability, Waltz and Goldstein discount the notion of nuclear disarmament occurring anytime in the foreseeable future (Waltz, 2013, p. 108, 224; Goldstein, 2000, p. 295-296). While O'Hanlon (2010) is more optimistic than Waltz and Goldstein on the future possibility of nuclear disarmament, he cautions that any effort towards disarmament must carefully consider future threats and security variables where nuclear weapons may retain utility. Specifically, O'Hanlon (2010) argues that technological advances could one day make biological weapons as deadly as nuclear weapons; in such a scenario, nuclear weapons may be required to deter, and if necessary, respond to especially deadly biological weapons attacks (p. 57-62). O'Hanlon (2010) also states that Western conventional military superiority is unlikely to last forever and therefore can not be counted upon as a long-term substitute for nuclear deterrent forces; O'Hanlon describes a theoretical scenario where a powerful conventional military threat could justifiably spur other states to build nuclear weapons (p. 62-71). O'Hanlon (2010) also warns that a hasty move to nuclear disarmament could actually end up encouraging proliferation, especially among American allies that depend on U.S. security assurances (p. 71-80).

Conclusion

The primary benefit of nuclear weapons is their ability to ensure a state's security and survival. While specific nuclear postures and force structures will vary, every nuclear state uses their forces to deter major threats (Waltz, 2013). Domestic political dynamics may be very useful to explain the timing of major decisions within some states' nuclear weapons programs. While prestige may have been a secondary motive in some historic cases of nuclear proliferation, the development of norms that discourage the possession of nuclear weapons likely now means that contemporary and future state proliferators will pay a net reputational cost (Sagan,

1996/1997). Given the considerable challenges regarding the feasibility of global nuclear disarmament, coupled with the prevalent view that nuclear weapons have significantly contributed to the absence of major interstate wars between the world's leading powers, the path to developing a nuclear free world will be an arduous affair lasting at least decades (Waltz, 2013; Goldstein, 2000; Sagan, 2013; O'Hanlon, 2010). The case for a realistic vision of nuclear disarmament will be discussed in chapter three of this study.

Chapter 3: The Case for Nuclear Disarmament – The Dangers, Limitations, and Potential Irrelevance of Nuclear Weapons; What Nuclear Disarmament Might Look Like and How It Might Happen

Unlike nuclear optimists who often assume that the realities of nuclear deterrence mean that nuclear weapons are unlikely to be used again, advocates of nuclear disarmament generally emphasize that a future use of nuclear weapons, whether deliberate or otherwise, remains possible as long as these weapons exist within the international system, and would be a human tragedy and catastrophe given the incredible destructiveness of these weapons (O’Hanlon, 2010, p. 22-23). Rooted in theoretical frameworks such as organization theory and constructivism, a number of arguments within the existing academic literature highlight the dangers, limitations, and potential irrelevance of nuclear weapons; these arguments either support, or are sympathetic to, the general notion of nuclear disarmament. This chapter will briefly review arguments involving military bias and the possibility of nuclear deterrence failures, nuclear accidents and inadvertent escalation, the possibility of nuclear terrorism, nuclear weapons and the security dilemma, practical and moral consequences regarding nuclear weapons, norms against the use of nuclear weapons, and questions over the relevance of nuclear weapons. This chapter will also examine how a realistic version of nuclear disarmament might occur.

The Dangers of Nuclear Weapons

Organization Theory, Military Bias and Deterrence Failures

Scott Sagan is one of the most prominent scholars to emphasize the inherent dangers of nuclear weapons, utilizing organization theory to argue the “nuclear peace” is far from guaranteed and that nuclear proliferation carries unavoidable risks (Sagan, 2013, p. 41-43). In

contrast to realism's assumption that nuclear states act as unitary actors, Sagan's central point is that fallible military bureaucracies are the actual custodians of nuclear weapons, and that organizational dynamics can increase the probability that deterrence could fail and nuclear weapons could be used (Sagan, 2013, p. 134). Sagan (2013) states that military organizations typically view armed conflict as unavoidable and will generally favor offensive operations, including preventive or preemptive attacks, to achieve military objectives regardless of non-military considerations or sensitivities (p. 49-50). Sagan (2013) discusses several early Cold War examples of the U.S. military's lobbying for preventive nuclear attacks against the Soviet Union and China, as well as late-1960s Soviet military arguments for preventive attacks against China's nuclear capability (p. 50-56). Sagan (2013) also argues that military bias, traditions, and rigid procedures can interfere with the development of a second-strike nuclear capability that is typically assumed to be a requirement for stable nuclear deterrence (p. 57-59). For example, the U.S. Air Force and U.S. Navy initially resisted the development of ballistic missile systems due to organizational commitments to traditional military systems and missions, even though ballistic missiles would significantly improve the effectiveness and survivability of the U.S nuclear deterrent (Sagan, 2013, p. 60-62). Sagan (2013) also discusses examples of Soviet military practices during the Cold War that allowed for the U.S. discovery of Soviet nuclear force locations, which made the Soviet Union's nuclear capability relatively vulnerable to preemptive attacks (p. 62-63). Sagan's concern is that emerging and future nuclear states may also be plagued by military biases and practices that could lead to deterrence failures, especially in states such as Pakistan where the military is relatively autonomous (Sagan, 2013, p. 56-57, 63-67).

Nuclear Accidents, Unauthorized Use, and Inadvertent Escalation

Sagan also emphasizes the danger of nuclear accidents and inadvertent escalation, noting the inherent complexities, hazards, and time sensitivities of nuclear operations, as well as bureaucratic interests that can limit nuclear safety (Sagan, 2013, p. 68-70). A central challenge to nuclear operations is the “usability paradox” – nuclear forces must be sufficiently employable to support a credible nuclear deterrence strategy, but adequate safeguards must also be in place to prevent the accidental or unauthorized use of nuclear weapons (Sagan, 1989, p. 4-5). The history of U.S. nuclear force operations contains many examples of dangerous military activities that could have led to an accidental or inadvertent use of nuclear weapons (Sagan, 2013, p. 70). Throughout much of the 1960s, the U.S. Air Force’s Strategic Air Command (SAC) maintained an airborne alert posture where a small number of nuclear-armed bombers were continuously flown; several crashes occurred, including a January 1961 B-52 bomber crash in North Carolina where one of its nuclear weapons nearly detonated (Sagan, 1993, 167-170, 202; Schlosser, 2013, p. 245-247; National Security Archive, 2014, June 11). After a nuclear-armed B-52 crashed in Spain in 1966, Secretary of Defense McNamara attempted to end the airborne alert program, but faced significant resistance from U.S. military leadership (Sagan, 1993, p. 178-179). Another nuclear-armed B-52 crashed near a U.S. radar installation in Greenland in 1968; this bomber’s mission included a tasking to observe the U.S. facility and be ready to report if it was ever attacked (Sagan, 1993, p. 156-157, 170-173, 180-181). Sagan (1993) argues this 1968 B-52 mission that involved a nuclear bomber functioning as an early warning system carried “an increased risk of an accidental war through a false warning” (p. 181). Despite continued U.S. military resistance, SAC’s airborne alert program ended in 1968 in the wake of the B-52 crash in Greenland (Sagan, 1993, p. 193-195). Sagan (1993) concludes the U.S. Air Force’s bureaucratic

interests were a key factor to explain the resistance to ending the airborne alert program; an “ingrained belief in the importance and uniqueness of the strategic bomber colored the air force’s judgment concerning specific operational practices... sitting on runway alert just doesn’t compare to flying realistic B-52 airborne training missions with nuclear weapons onboard” (p. 199).

In an additional example involving air operations, in August 1962 a U.S. nuclear-armed bomber on a routine airborne alert mistakenly flew a route that almost led to the penetration of Soviet territory. Even though an internal U.S. Air Force investigation concluded that nuclear bomber flight routes needed to be modified, bureaucratic inertia delayed the flight route change until November 1962, well after the start of the Cuban missile crisis; senior U.S. government leaders were apparently never informed of this problem (Sagan, 1993, p. 73-77). Sagan (1993) recounts an incident when military systems complexities and time pressures in the midst of a crisis could have led to inadvertent escalation:

On the night of October 25, 1962, an air force sentry was patrolling the perimeter of a military base near Duluth, Minnesota. It was the height of the Cuban missile crisis, and nuclear-armed bombers and interceptor aircraft, parked on air base runways and at commercial airports throughout the United States, were alert and ready for war. The sentry spotted someone climbing the base fence, shot at the figure, and sounded the sabotage alarm. At airfields throughout the region, alarms went off, and armed guards rushed into the cold night to prevent Soviet agents from sabotaging U.S. nuclear forces. At Volk Field in Wisconsin, however, the wrong alarm bell rang: the Klaxon signaling that nuclear war had begun went off. Pilots ran to their nuclear-armed interceptors and started the engines. These men had been told that there would be no practice alert drills

during the tense crisis, and they fully believed that a nuclear war was starting as they headed down the runway. Fortunately, the base commander contacted Duluth before the planes took off and discovered what had happened. An officer in the command post immediately drove his car onto the runway, flashing his lights and signaling the interceptors. The pilots saw him and stopped their aircraft. The suspected Soviet saboteur that caused the whole incident was, ironically, a bear. (p. 3)

In another incident during the Cuban missile crisis, U.S. Air Force missile officers stationed in Montana were able to reconfigure their intercontinental ballistic missile (ICBM) control systems to fire their weapons autonomously; this dangerous situation was never properly reported to U.S. military leadership (Sagan, 2013, p. 70). Additionally, during the Cuban missile crisis an ICBM was test launched from a U.S. Air Force test location where other missiles had been armed and placed on an operational alert; the danger here is that during this period of high tension the Soviet Union could have viewed this missile test as the beginning of a nuclear attack (Sagan, 2013, p. 70). The U.S. has also experienced several incidents involving false warnings of a nuclear attack; in October 1962 and November 1979 the mistaken use of exercise tapes in operational systems led U.S. military officials to briefly think the U.S. was under nuclear attack, and in June 1980 a computer glitch led to a brief U.S. nuclear alert (Sagan, 1993, p. 228-233, 245; Sagan, 2013, p. 70-71).

Sagan (2013) stresses that new nuclear states that deploy operational weapons systems are likely to face similar challenges to nuclear safety, especially during crises when nuclear forces may be placed on a higher alert status (p. 72-77). Sagan also notes that new nuclear states could be more accident-prone due to issues such as rudimentary nuclear warhead designs, geographic proximity to rival states, and internal instability (p. 72-77). While well-disciplined

and trained military forces can reduce the chances of a mishap, military operations, including nuclear force operations, are inherently dangerous and the possibility of accidents can never be excluded (Sagan, 2013, p. 68).

The Possibility of Nuclear Terrorism

The danger of nuclear terrorism is commonly discussed in the academic literature and highlighted as a key reason to work towards nuclear disarmament (Sagan, 2013, p. 216-217; Daalder & Lodal, 2008; O'Hanlon, 2010, p. 41-43). There have long been concerns over nuclear terrorism; for example, both a 1970s European terrorist group and a 1990s Japanese apocalyptic terrorist group, Aum Shinrikyo, sought to steal nuclear weapons (Sagan, 2013, p. 116, 216; Stern, 2000, p. 205-210; Allison, 2004, p. 40-42). After the Soviet Union dissolved, a number of studies warned of the danger of Soviet "nuclear leakage" (Allison, 2004, p. 1, 9-10, 27, 43-46, 49, 60-74; O'Hanlon, 2010, p. 42; Stern, 2000, p. 223). Allison (2004) describes multiple instances from the 1990s and 2000s of nuclear smuggling emanating from former Soviet republics, as well as a 1993 case where a U.S. government team discovered well over a 1,000 pounds of highly enriched uranium (HEU) in an unsecure location in Kazakhstan (p. 64-73). A scenario involving the theft of nuclear materials is feasible, even for stable Western nuclear states; Allison (2004) notes two examples from the 1990s of U.S. government exercises where military teams were able to steal significant amounts of fissile materials from U.S. nuclear laboratories in New Mexico and Colorado (p. 83-84). In terms of general capability, terrorists might acquire assembled nuclear weapons or a sufficient amount of fissile materials such as HEU or plutonium to construct a basic nuclear device (O'Hanlon, 2010, p. 41-42; Allison, 2004, p. 10, 87-89, 92-98; Stern, 2000, p. 225-226). Alternatively, terrorists could acquire non-fissile

radioactive materials such as cobalt or cesium, combining them with conventional weapons to build a radiological bomb; while such a “dirty” bomb would be far less destructive than a nuclear weapon, a radiological bombing could have a significant psychological impact on a targeted population and could contaminate a sizeable portion of a city, rendering an area uninhabitable until after an expensive decontamination (Allison, 2004, p. 6-8, 57-59; Stern, 2000, p. 203, 212-213, 225). A nuclear weapon or radiological bomb would not be difficult to smuggle across national borders and deliver to its intended target (Allison, 2004, p. 104-120; O’Hanlon, 2010, p. 42). The possibility that terrorists could acquire nuclear weapons or nuclear materials only increases as nuclear technology spreads due to the worldwide expansion of the nuclear power industry and the continued proliferation of nuclear weapons (Daalder & Lodal, 2008; Sagan, 2013, p. 216-217; O’Hanlon, 2010, p. 43-46). As argued by Lieber and Press, the prospects that a nuclear state would intentionally provide a nuclear weapon to a terrorist group may be low (Lieber & Press, 2013, Summer, p. 83-84, 103-104). However, the greater danger may be that lapses in a state’s nuclear security measures could allow terrorists the opportunity to steal nuclear weapons or materials, especially if sympathetic insiders provided assistance (O’Hanlon, 2010, p. 42). The example of Pakistan is especially worrisome. Given Pakistan’s growing arsenal of tactical and strategic nuclear weapons, its history of political instability, its ongoing battle against multiple terrorist groups within its own territory, and its history of cooperation with some terrorist groups, a risk exists that Pakistani nuclear weapons or materials could find their way to terrorist groups, especially if Pakistani nuclear custodians are co-opted (Sagan, 2013, p. 121-122, 152; O’Hanlon, 2010, p. 42; Allison, 2004, p. 11, 20-23, 37-40, 77-78). These concerns about Pakistan and nuclear terrorism are reinforced by the fact that A.Q. Khan, a central figure in

Pakistan's nuclear weapons program, operated a nuclear black market for many years (Allison, 2004, p. 61-63).

In terms of will, Sagan notes the classical scholarly argument that most terrorist groups will not seek to conduct mass casualty attacks, which could still be the case with many contemporary terrorist groups; however, Sagan and others point out that some terrorist groups such as al-Qaida clearly have demonstrated a desire for both mass casualty attacks and nuclear weapons (Sagan, 2013, p. 115-120; O'Hanlon, 2010, p. 42; Allison, 2004, p. 3, 12-14, 20-29; Stern, 2000, p. 215-217). Sagan and others also emphasize that deterrence strategies are unlikely to work against a terrorist use of nuclear weapons and that the focus of effort should be prevention (Sagan, 2013, p. 117-120, 217; Daalder & Lodal, 2008; Allison, 2004, p. 15, 42). Terrorist groups such as the Islamic State of Iraq and Syria (ISIS), with its brutal attacks and reported use of chemical weapons, would probably not hesitate to utilize nuclear weapons or materials (Entous, 2015, August 13).

Nuclear Weapons, State Rivalries, and the Security Dilemma

In contrast to the arguments of nuclear optimists that tout the stabilizing effect of nuclear weapons, O'Hanlon (2010) emphasizes the danger that nuclear-armed states can still go to war with each other, and that the potential for nuclear war will persist as long as these weapons remain within the context of international relations (p. 25-35). From this perspective, the introduction of nuclear weapons amongst existing state rivalries can be especially precarious since such weapons can potentially exacerbate security fears and spur arms races (O'Hanlon, 2010, p. 27-28, 32-34). The history of the Cold War included multiple superpower crises that could have resulted in a nuclear war (O'Hanlon, 2010, p. 26-31). The closest point in which the

superpowers could have started a nuclear conflict was probably during the Cuban missile crisis, but O'Hanlon (2010) also describes several other Cold War crises in Europe, Asia, and the Middle East that included implicit threats to use nuclear weapons (p. 27-30). O'Hanlon (2010) warns "that we are becoming inured to a real risk of nuclear conflict as a reality of the modern world, and it is a reality that has hardly changed despite the end of the cold war... countries with the bomb do in fact think about using it at times – or at least threatening to use it, creating dynamics that may not always prove easily controllable" (p. 33-34). In contrast to Ganguly's nuclear optimism with regards to India and Pakistan, O'Hanlon and Kapur argue that the enduring rivalry between these South Asian neighbors is a concerning example of a nuclear dyad where brinkmanship runs the real risk of a nuclear exchange (Ganguly, 2008, p. 46; O'Hanlon, 2010, p. 32-33, Kapur, 2008, p. 72-73). Even though both states overtly demonstrated their nuclear capabilities with their 1998 nuclear tests, India and Pakistan fought a brief war in 1999 in the disputed region of Kashmir when Indian forces found Pakistani military personnel who had clandestinely crossed the Line of Control (LoC) and established positions within Indian-controlled territory (Lavoy, 2009, p. 1, 20-21; Sagan, 2013, p. 142-143). This war that would be known as the Kargil War is notable in that it is a recent and rare case of a limited war breaking out between two nuclear-armed states (Lavoy, 2009, p. 1-2, 30-31, 36-37; Sagan, 2013, p. 143). It is possible that the specter of nuclear weapons actually served as an enabler for the Kargil War; Pakistan perceived that its nuclear capability would serve as a shield to deter large-scale Indian conventional attack, thus allowing Pakistani military forces to engage in low-level military operations within Kashmir (Kapur, 2008 p. 72, 74-75; Sagan, 2013, p. 144; Hoyt, 2009, p. 144-145). Even though the Kargil War remained a limited conflict, it was a dangerous and risky endeavor, especially given the inherently chaotic and uncertain nature of warfare and the

fact that India and Pakistan were nascent nuclear states with no declared policies or doctrine regarding nuclear weapons (Kapur, 2008, p. 79-80). More broadly, the Kargil War presents a cautionary note regarding nuclear proliferation in that one cannot assume that newly created nuclear dyads will automatically enjoy strategic stability (Kapur, 2008, p. 93-94).

The Limitations of Nuclear Weapons

Practical and Moral Considerations of Nuclear Retaliation Against Small States

In examining the prospects of conflicts between small and large nuclear states, Nichols (2014) argues that a large nuclear power such as the U.S. would face practical and moral considerations that could significantly inhibit nuclear retaliatory options (p. 127-169). Nichols (2014) acknowledges the danger of asymmetric nuclear escalation, a situation where if a small nuclear state finds itself losing a conventional war with a great power, the smaller state may choose to employ nuclear weapons as a last ditch effort to prevent total defeat (p. 131-132). In such a scenario, it is a common assumption to think that the larger power would simply retaliate with nuclear strikes (Nichols, 2014, p. 129-132). However, unlike Cold War scenarios that involved the possibility of large-scale, existential nuclear war between the superpowers, Nichols (2014) argues that a nuclear confrontation between a large state and small state would be significantly different given that the larger power's survival will not necessarily be threatened (p. 129-133). In terms of practical considerations, Nichols (2014) argues small states such as North Korea would offer relatively few viable targets for a nuclear retaliatory strike (p. 132, 141). Nuclear retaliation could understandably focus on destroying the aggressor state's remaining nuclear forces, but a small nuclear state may very well use all of its nuclear weapons in any initial attack (Nichols, 2014, p. 134-137). In addition, nuclear counterforce operations against an

aggressor state's remaining nuclear forces could involve large nuclear strike packages, likely resulting in broad collateral damage, including heavy civilian casualties (Nichols, 2014, p. 137). Nuclear strikes could also be conducted against a small state's conventional military forces, but nuclear weapons are generally not required to destroy these kinds of targets, especially for superpowers like the U.S., which has powerful conventional military options (Nichols, 2014, p. 137). Regardless of the specific target set, Nichols (2014) also describes an issue of geographic "co-location" where many possible targets within a small nuclear state are relatively close to cities; nuclear strikes could very well produce significant radioactive fallout, resulting in many civilian casualties (p. 138-141). Nuclear fallout could also negatively impact non-involved states within a region, inflicting civilian casualties (Nichols, 2014, p. 138-139). Nichols (2014) emphasizes that most nuclear retaliatory strike scenarios would likely cause at least thousands of immediate civilian casualties, as well as an enduring threat of radiation (p. 141-146). A "limited" use of nuclear weapons at a regional level could also lead to broader environmental impacts, potentially negatively affecting the agricultural sector around the world (Toon, Robock, Turco, Bardeen, Oman & Stenchikov, 2007, p. 1224-1225).

In terms of ethical considerations, Nichols (2014) asserts "the most immediate moral obstacle to nuclear retaliation is asymmetry: nuclear retaliation from a superpower against a much smaller nation will unavoidably be disproportionate in its damage and collateral effects" (p. 150). With some small nuclear states such as North Korea that are governed by a brutal autocracy, the moral quandary of nuclear retaliation is exacerbated given that nuclear retaliatory strikes would lead to significant suffering for a civilian population that was not involved in their state's strategic choices (Nichols, 2014, p. 150). Nichols (2014) emphasizes that moral considerations would matter since a large nuclear state's existence is not likely to be threatened

by a small state's use of nuclear weapons (p. 149-153). To counter the threat that a small nuclear state may employ asymmetric nuclear escalation during a conventional conflict, Nichols (2014) argues a large state such as the U.S. would be better served using conventional military retaliation, including options that threatened regime change and full-fledged conventional war (p. 157-169).

International Norms Against the Employment of Nuclear Weapons

The development of an international norm discouraging nuclear proliferation was briefly discussed in chapter two of this study; however, since 1945 an international norm against the use of nuclear weapons has also developed that invariably limits the benefits of nuclear weapons (Tannenwald, 2005, p. 39-41). Utilizing constructivist logic, Tannenwald (2005) argues this norm has developed into a nuclear taboo, "a de facto prohibition against the first use of nuclear weapons. The taboo is not the behavior (of nonuse) itself but rather the normative belief about the behavior... A taboo is a particularly forceful kind of normative prohibition... It typically refers to something that is not done, not said, or not touched" (p. 8). Tannenwald (2005) describes the evolution of thinking regarding nuclear weapons, from the early 1950s perspectives of some U.S. leaders that nuclear weapons might be employable in future conflicts, to a view of nuclear weapons as a uniquely dangerous class of weapons that could not be used for war-fighting; this later view began to dominate by the 1960s (p. 11-12, 14-33). Tannenwald (2005) emphasizes the moral dimension of the nuclear taboo – "At its core is the belief that nuclear weapons, because of their immense destructive power, flagrantly violate long-standing moral principles of discrimination and proportionality in the use of force" (p. 11, 36). Tannenwald (2005) highlights the influence of international organizations such as the UN, non-nuclear

weapon states, and a “grassroots global antinuclear weapons movement” in molding public views of nuclear weapons (p. 7, 9-11, 18-23, 33, 46). While the development of a nuclear taboo has depended on these actors who ultimately seek global nuclear disarmament, the nuclear taboo allows and even supports the general notion of nuclear deterrence – “More paradoxically, the taboo has also helped to stabilize, rather than undermine, mutual nuclear deterrence between the superpowers, not by any technical means but by helping to embed deterrence in a set of shared practices, institutions, and expectations” (Tannenwald, 2005, p. 41; as cited in Lieber & Press, 2006, p. 9). Even though the use of nuclear weapons is not formally illegal under international law, Tannenwald (2005) notes the many international agreements that place restrictions on when nuclear weapons might be used, arguing “these agreements enhance the normative presumption against nuclear use...while the legality of nuclear weapons remains in dispute, the trend line of decreasing legitimacy and circumscribed legality is clear” (p. 9-11, 28). Tannenwald (2005) acknowledges the nuclear taboo is not absolute:

It is true that if nuclear weapons were fully delegitimized and their use fully unthinkable in absolutely all circumstances, we would expect nations to cease preparing for nuclear war and to get rid of their nuclear arsenals. That would suggest a fully robust taboo. The fact that nuclear states have not yet reached this end point, however, should not prevent us from noticing that they have made it part way down the path. The use of nuclear weapons has become unthinkable for many circumstances in which such use was once contemplated or regarded as a legitimate alternative, for almost every purpose except “last resort”... The fact that nations continue to maintain nuclear arsenals... shows that the taboo is not fully robust, but it also reveals the continuing belief in deterrence: that nuclear weapons prevent war even when they cannot be used. (p. 39-40)

Tannenwald (2005) also acknowledges the nuclear taboo is not a given with all nuclear states, noting cases such as Pakistan with its history of nuclear saber rattling during crisis periods with India (p. 36).

Rather than a strict nuclear taboo, other scholars such as T.V. Paul state the non-use of nuclear weapons involves a less stringent norm, preferring to use the term “tradition” – “a tradition in this sense is a time-honored practice of non-use that has been followed by nuclear states since 1945 as an ‘accustomed obligation’” (Paul, 2009, p. 1, 5). Paul (2009) argues the term tradition is more accurate since the non-use of nuclear weapons is not as strong as social taboos against acts such as cannibalism; “most social taboos are punishable acts – punishable either by the community (through customs) or the state (through law), each expecting observance by its members... In contrast, the prohibition against nuclear use is not as absolute... International law does not explicitly prohibit the use of nuclear weapons...” (p. 6-8). In addition, while violating social taboos is considered unthinkable, nuclear states have operational plans to use nuclear weapons, as well as military training exercises to ensure the viability of nuclear forces (Paul, 2009, p. 8-9). Paul (2009) views the tradition of non-use of nuclear weapons as “an informal social norm” that could one day become an actual taboo with formal international legal prohibition (p. 9-11, 14, 209-210). Paul (2009) argues the tradition of nuclear non-use developed due to the enormous destructiveness of these weapons and the “negative reputational effects” for any state that used nuclear weapons, including the notion that nuclear use could establish negative precedents encouraging nuclear proliferation and future uses of nuclear weapons (p. 1-3, 12, 36-37). Daryl Press, Scott Sagan, and Benjamin Valentino recently conducted a survey experiment involving U.S. citizens that presented theoretical scenarios where the U.S. might use nuclear weapons. The results of this survey experiment lend support to Paul’s emphasis on

negative precedents as an important concern encouraging the non-use of nuclear weapons – “the most common reason why respondents did not prefer a nuclear strike was their fear of setting a precedent (‘using nuclear weapons in this situation might encourage other states or terrorist groups to use nuclear weapons against the U.S. or our allies in the future’)” (Press, Sagan & Valentino, 2013, p. 188-189, 192, 195-196, 199-200, 202). The study found surprising levels of support for using nuclear weapons among the American people, a finding that does not lend credence to the notion of a strict nuclear taboo:

Far from being unthinkable or repulsive, the experiments suggest that U.S. nuclear use is something that a substantial majority of the American public is prepared to support, at least in high stakes situations... the public is inclined to give American leaders wide latitude on the decision to use nuclear weapons, at least in the short term and in high-threat scenarios... for most Americans, the inhibitions against nuclear weapons are relatively weak and decidedly not subject to a taboo... Most Americans appear to weigh the consequences of using nuclear weapons in the narrow terms of immediate military effectiveness... the U.S. public’s preference for nuclear options seems to grow steadily as a function of perceived utility. (Press, Sagan & Valentino, 2013, p. 198, 200, 202)

Press, Sagan, and Valentino (2013) suggest that performing similar survey experiments with international audiences could be useful to further determining the strength of the norm of nuclear non-use (p. 203-204).

Nuclear weapons as Irrelevant?

John Mueller (1988) argues against the notion that nuclear weapons have caused a “nuclear peace” between major powers, asserting that other factors such as the great

destructiveness of modern conventional weapons account for the lack of global interstate wars in the international system. Mueller (1988) questions the assumption that without nuclear weapons the Cold War would have inevitably led to a “hot” war between the U.S. and Soviet Union (p. 56). The collective experiences of World War II have served as a consistent reminder of the extraordinary devastation inherent to contemporary warfare – “Even before the [atomic] bomb had been perfected, world war had become spectacularly costly and destructive, killing some 50 million worldwide” (Mueller, 1988, p. 57, 66). Mueller (1988) also argues the superpowers were essentially status quo states within the post-World War II international system, with both sides wishing to avoid actions that could escalate into any major war, whether conventional or nuclear (p. 57-64). Mueller (1988) acknowledges the specter of a nuclear war is likely a daunting prospect for any state’s leaders, but his point “is simply to stress that the sheer horror of repeating World War II is not all that much *less* impressive or dramatic, and that powers essentially satisfied with the status quo will strive to avoid anything that they feel could lead to *either* calamity” (p. 66). From a broader perspective, Mueller (1988) suggests the lack of interstate wars in the developed world may also be due to a “general stability” where armed conflict is no longer seen as a legitimate option to settle disputes (p. 69-79).

What Nuclear Disarmament Might Look Like and How It Might Happen

O’Hanlon (2010) is critical of nuclear disarmament proponents who take an absolutist stance that nuclear weapons must be abolished in the near term and that abolishment must be forever, stating that such a stance is unrealistic in that it discounts the significant challenge of verification inherent to nuclear weapons agreements and ignores potential future threats that could call for nuclear deterrence strategies; a hasty move to try to ban nuclear weapons could

even end up spurring additional nuclear proliferation, especially among American allies that depend on U.S. security assurances (p. 47-80). Verification of any nuclear disarmament agreement would be very challenging given the scientific reality that “nuclear weapons, and the key materials inside of them, are hard to detect” (O’Hanlon, 2010, p. 49). Verification will only become more challenging as the infrastructure for nuclear power industries continues to expand worldwide (O’Hanlon, 2010, p. 53). On future threats, O’Hanlon (2010) notes theoretical scenarios involving advanced biological weapons and powerful conventional military capabilities that could logically require nuclear weapons for deterrence purposes (p. 57-71).

Instead of a utopian vision of permanent nuclear abolishment, O’Hanlon (2010) offers a more realistic alternative of disarmament that would involve the dismantlement of nuclear weapons with a legally permissible option for reconstitution of a nuclear arsenal under certain circumstances (p. 82-84). A nuclear dismantlement agreement would need to include all nuclear weapons-capable states and would require a very intrusive and comprehensive verification and monitoring regime that accounted for all nuclear weapons and fissile materials; such a regime would be much stronger than the current NPT regime administered by the International Atomic Energy Agency (IAEA):

Nuclear weapons would be banned. No state would have the right to possess them.

Materials designed for use in them would no longer be produced... In short, the goal would be to keep close watch on all nuclear facilities, to prohibit production and retention of fissile material (or dedicated bomb components) usable in a nuclear device, and thereby to have at least months of advance warning of any decision by any state to pursue a nuclear weapon. There would be no double standards on verification or anything else for that matter; all nuclear facilities in all places would be treated comparably. For that

reason, even democratic countries would need to accept the occasional challenge inspection on their territory, simply to preserve a sense of fair play and equality under the regime. (O'Hanlon, 2010, p. 91-93)

O'Hanlon (2010) acknowledges that such a nuclear disarmament regime would face enduring challenges and would not be perfect, but argues that a reasonably effective regime could be constructed provided it had sufficient resources and cooperation from states (p. 93-95).

Reconstitution of a nuclear arsenal would have to be legally allowed under a nuclear disarmament treaty for scenarios such as the discovery of a cheating state that had developed or maintained a clandestine nuclear weapons capability, the development of biological weapons that had become advanced enough to nearly equal the deadliness of nuclear weapons, or the emergence of an expansionist state wielding a massive conventional military capability (O'Hanlon, 2010, p. 95-99). O'Hanlon (2010) argues that should a valid nuclear rearmament occur, it should not necessarily be viewed as the end of a nuclear disarmament agreement; once the circumstances that had caused nuclear reconstitution were resolved, the rebuilt nuclear forces could be subsequently dismantled (p. 100). In order for a nuclear disarmament agreement to be viable, O'Hanlon (2010) emphasizes that it must be flexible enough to deal with the potential for time periods of nuclear reconstitution (p. 100-103).

In terms of the conditions for how nuclear disarmament could actually happen, O'Hanlon (2010) argues that a number of serious security issues would need to be resolved in order to create an international system able to forgo nuclear deterrence strategies (p. 86-90). O'Hanlon (2010) states "these issues include the status of Taiwan; the matter of Kashmir; political relations between Russia and key "near-abroad" states, Georgia and Ukraine in particular; and the Arab-Israeli conflict" (p. 86). One could add other contemporary security challenges such as the

territorial disputes in the East and South China Seas, as well as the recent significant downturn in Russian relations with the U.S. and Europe. Given the considerable and enduring challenges involved with each of these security issues, the timeframe for moving towards a nuclear disarmament treaty is realistically at least decades away, if not much longer (O'Hanlon, 2010, p. 87-91). Goldstein (2000) offers other theoretical scenarios that would involve an even more radical change to the international security environment. Based on the conclusions of democratic peace theory, an international system comprised primarily of liberal democracies could provide the security and stability for states to forgo nuclear weapons; other possibilities would involve "a change in the anarchic structure of the state system that rendered international commitments enforceable... or a transformation of interests that led all states to rank adherence to global norms against possessing nuclear weapons above preserving national autonomy" (Goldstein, 2000, p. 218-219, 263). Goldstein's scenarios involving the dominance of liberal democracy or the fundamental restructuring of the international system could theoretically resolve the security imperative that drives many states to develop nuclear weapons. Obviously, it is improbable that such radical transformations of the international system will occur anytime in the foreseeable future.

Conclusion

While nuclear weapons may provide a powerful deterrent against major threats to a state, several arguments in this chapter highlight that the continued existence of nuclear weapons entails significant risks for international security. Dangers such as the specter of nuclear terrorism and the accidental or inadvertent use of nuclear weapons will persist and could even become worse with continued nuclear proliferation (Sagan, 2013; Daalder & Lodal, 2008;

O'Hanlon, 2010; Allison, 2004). In addition, arguments regarding the practical and moral consequences of nuclear weapons, as well as the development of a norm against nuclear use, invariably limit the utility of nuclear weapons by establishing that any conceivable use of nuclear force that might be considered legitimate would have to involve existential threats to a state (Nichols, 2014; Tannenwald, 2005; Paul, 2009). Nuclear disarmament is possible, but only after addressing the international system's major security issues, and any disarmament agreement will likely require a robust verification and monitoring regime that allows for the possibility of legal nuclear reconstitution (O'Hanlon, 2010).

Chapter 4: NUCLEAR BALANCE THEORY

There is an inherent and expressed tension between scholars who emphasize the continued efficacy of nuclear weapons and deterrence, and others who prioritize strengthening nuclear nonproliferation efforts, reducing the dangers of nuclear weapons, and moving towards nuclear disarmament. For example, in response to Lieber and Press' arguments regarding a "counterforce revolution" and nuclear deterrence, Jan Lodal writes "Lieber and Press' concept for nuclear war fighting, like all the many others before it, collapses under even the most superficial examination. It does not even address the most immediate threat: that a terrorist organization will acquire a nuclear weapon. By proposing yet another unworkable nuclear strategy, their article emphasizes that only by eliminating nuclear weapons can the world be protected from the existential threat they pose" (Lodal, 2010). In another response to Lieber and Press' arguments, James Acton notes "the surest and best way of avoiding nuclear use is preventing nuclear proliferation... A successful nonproliferation regime requires a broad-based international consensus... creating such a consensus will require the United States to work towards a world without nuclear weapons. Devaluing nuclear weapons is an important step on this path. The further development of nuclear counterforce capabilities will only make this goal harder to achieve" (Acton, 2010). Hans Kristensen, Matthew McKinzie, and Ivan Oelrich charge that Lieber and Press' article "'The Nukes We Need' is an unfortunate distraction on the path to understanding how a safer, more stable deterrent relationship with China and Russia can and should be achieved. The challenge today is not to make the use of nuclear weapons more credible. It is to reduce their salience" (Kristensen, McKinzie, & Oelrich, 2010). In response to such criticisms, Lieber and Press have stated "if analysts continue to hold a false sense of the irrelevance of nuclear weapons even as U.S. adversaries cling to them to try to keep the United

States at bay – and if analysts convince enough policymakers to do the same – there is a real danger the United States could stumble into a nuclear war... Unfortunately, many contemporary nuclear analysts, policy advocates, and policymakers seek to minimize discussion about nuclear weapons and simply assert that nuclear weapons are not particularly useful in the twenty-first century. That is a dangerous approach” (Lieber & Press, 2013, p. 10-12).

While in one sense maintaining a nuclear deterrent force in perpetuity is in inherent conflict with the notion of a distant future involving complete nuclear disarmament, in another sense one can view contemporary deterrence, nonproliferation, and disarmament efforts as potentially complementary and linked since each of these objectives share the overarching goal of preventing the future use of nuclear weapons (Ferguson, Perry & Scowcroft, 2009, p. 93). Efforts by nuclear states to pursue nuclear disarmament, even though such efforts do not yet produce complete disarmament and deterrent forces continue to exist, can engender some international support to nonproliferation policies (Knopf, 2012/2013, p. 94). A middle approach may be possible where nuclear states seek to balance the goals and benefits of nuclear deterrence with nuclear nonproliferation efforts and the long-term vision of nuclear disarmament. Such a balanced approach could also reduce, but not eliminate, some of the inherent dangers of nuclear weapons (Goldstein, 2000, p. 278, 296-298; Hagerty, 1998, p. 37). Timing is a key variable that allows for this middle or balanced approach; nuclear deterrence relationships exist today and can be maintained for the foreseeable future given that the timeline for global nuclear disarmament is decidedly long-term and uncertain. The challenge in the coming years and decades is to shape nuclear deterrence relationships in ways that are conducive to allowing for the future possibility of nuclear disarmament. The following sections of this chapter will develop a “nuclear balance” theoretical model, focusing on how a state can develop a nuclear weapons policy involving

nuclear posture and force structure that ensures strategic deterrence and stability while also supporting nuclear nonproliferation and disarmament policies. For the purposes of this theoretical model, the term “nuclear posture” refers primarily to the circumstances in which a state might choose to use nuclear weapons, as well as the deployment patterns of nuclear forces and potential targets; the term “force structure” refers to the size and characteristics of a state’s nuclear deterrent. The terms “nuclear strategy” and “nuclear doctrine” are used interchangeably with nuclear posture. This theory recognizes that the current international nuclear environment is more complex than the bilateral nature of the Cold War nuclear rivalry. Contemporary nuclear states face a dynamic and interconnected set of deterrence relationships that feeds a “security trilemma where actions taken by a state to defend against another state have the effect of making a third state feel insecure. Due to the trilemma, changes in one state’s nuclear posture or policy can have a cascading effect on the other nuclear-armed states” (Koblentz, 2014, p. 3). While the “security trilemma” is a challenge to international security, it also provides a potential opportunity for a given nuclear state to positively influence the evolving nuclear landscape (Koblentz, 2014, p. 31). The nuclear balance theoretical model is realist at its core in that it assumes that the international system will remain an anarchic environment where independent states are primarily responsible for their own security. This model draws upon both defensive and offensive realism. From defensive realism, it adopts the notion of the deterrent utility of small nuclear forces (Waltz, 2013; Glaser, 1998). From the offensive realist school of thought, it emphasizes the notion that nuclear forces, regardless of size, must be modern, flexible, and survivable in order to maintain an effective deterrent (Lieber & Press, 2013; Lieber & Press, 2013, January; Mearsheimer, 2014, p. 227-232). The nuclear balance model also takes into account the dangers of nuclear weapons as derived from organization theory and other dangers

such as nuclear terrorism, as well as recognizes the existence of international nuclear norms that support the nonproliferation regime (Sagan, 2013). In a general sense, this theoretical model is consistent with the concept of “analytic eclecticism,” described by Sil and Katzenstein as “an intellectual stance that supports efforts to complement, engage, and selectively utilize theoretical constructs embedded in contending research traditions to build complex arguments that bear on substantive problems of interest to both scholars and practitioners” (Sil & Katzenstein, 2010, p. 411; Paul, 2009, p. 2). While the nuclear balance model is most relevant for NPT-recognized nuclear weapon states given their Article VI legal commitment to eventually disarm, it is possible that any nuclear-armed state could follow such a balanced nuclear weapons policy.

Nuclear Posture: Asymmetric Nuclear Escalation vs. Assured Retaliation

In his study of regional states’ nuclear postures, Narang (2014) focuses on the operational aspects of nuclear doctrine instead of a state’s public statements on nuclear doctrine, arguing that the operational aspects are most relevant for deterrence; this focus on operational capabilities also has the advantage of increasing confidence in the coding of each state’s nuclear posture (p. 4, 21). Given the worst case planning that most state militaries typically conduct, it is logical to focus on the operational capabilities of a potential adversary when examining deterrence relationships; “states care more about what an adversary can credibly *do* with its nuclear weapons than what it *says* about them” (Narang, 2014, p. 4). However, declaratory doctrine for a nuclear state, especially one that is democratic, is important and should not be discounted since declaratory nuclear pronouncements are essentially public commitments; a democratic government that disregarded such public commitments could pay a significant political price in relation to domestic opponents and other states (Sagan & Vaynman, 2011, p. 28). Declaratory

posture does offer insight on a state's strategic thinking, serves as a tool to communicate deterrence threats, and can also directly influence a state's military planning for nuclear weapons employment (Sagan & Vaynman, 2011, p. 29; Sagan, 2009, p. 165). In addition, as Sagan (2009) notes, declaratory nuclear doctrine is important in terms of supporting a state's nonproliferation and disarmament policies, as well as potentially influencing the nuclear policies of other states (p. 165-166). A state's declaratory nuclear posture can influence other states by affecting international nuclear norms or standards of responsible behavior regarding the possession and possible use of nuclear weapons (Sagan, 2009, p. 166). A declaratory nuclear posture that involves a broad role or mission for nuclear weapons will generally not support nonproliferation and disarmament policies, which seek to reduce the utility of nuclear weapons. In contrast, a declaratory nuclear posture that restricts the role of nuclear weapons in a state's security strategy can be seen as potentially supportive of nonproliferation and disarmament objectives. For the purposes of the nuclear balance model, both the declaratory and operational aspects of nuclear posture will be considered. Ideally, the operational and declaratory components of a state's nuclear posture would be congruent.

As noted in chapter two of this study, Narang (2014) emphasizes the importance of a state's nuclear posture and concludes that the asymmetric nuclear escalation strategy works best to deter conventional attack, while the assured retaliation and catalytic postures performed relatively poorly (Narang, 2014, p. 2-5, 10-12, 15-21, 23, 26, 222-225, 230-236, 246, 248-251, 281-282, 291-292, 295-300, 306-308, 311). Narang (2014) also notes that his central conclusion "is likely to be controversial among scholars and practitioners of non-proliferation since it implies that nuclear weapons remain useful to deter conflict and that that utility is only achieved by states that orient their nuclear forces explicitly toward first use" (p. 310). An asymmetric

nuclear escalation posture, especially one that leads to the development of a diversified nuclear arsenal that is dispersed and on heightened alert, may increase many of the dangers of nuclear weapons, including the risks of inadvertent escalation, nuclear accidents, unauthorized use, and even the specter of nuclear terrorism (Narang, 2014, p. 311). In addition, since the asymmetric nuclear escalation posture allows for the first use of nuclear weapons, it runs counter to the international norm against the use of nuclear weapons. An asymmetric nuclear escalation posture oriented to deter conventional attacks, as well as similar nuclear postures configured to deter chemical or biological attacks, do not support the nonproliferation regime by continuing to assign nuclear weapons a broad deterrence mission; if a nuclear state claims it needs nuclear weapons to deter these kinds of nonnuclear attacks, a potentially proliferating state could argue that it also deserves to possess nuclear weapons in order to enjoy the same deterrent utility (Daalder & Lodal, 2008; Sagan, 2013, p. 217). States that believe they require an asymmetric nuclear escalation posture would invariably run into credibility problems regarding policy efforts on nonproliferation and nuclear disarmament. Despite these downsides, relatively weak states that face significant conventional military threats or other severe nonnuclear threats may very well feel required to employ an asymmetric nuclear escalation posture in order to ensure their security (Narang, 2014, p. 311). A state's perceived threat environment, as well as its available capabilities or options to counter such threats and ensure its security, are crucial variables in the selection of a nuclear posture and the overall feasibility of a balanced nuclear weapons policy. If a state thinks it needs nuclear weapons to counter a range of nonnuclear threats, a balanced or modest nuclear weapons policy is not possible.

On the other hand, relatively powerful states or great powers that have advanced conventional military forces may be able to rely on the threat of large-scale conventional

retaliation in order to deter a range of nonnuclear attacks, including conventional, chemical, or biological attacks. For these strong states, as well as their allies, a more modest or restricted nuclear posture may be feasible. If a state's security environment does not include overwhelming conventional or other nonnuclear military threats, such a state may be able to adopt a nuclear posture that still provides some deterrence benefit, but one that is also more consistent with nonproliferation and disarmament efforts. In order to balance the benefits of nuclear deterrence while still supporting nonproliferation and long-term disarmament objectives, a state would need to adopt an assured retaliation posture where nuclear weapons were only used to deter nuclear attacks, theoretically forgoing the option of using nuclear weapons to respond to conventional, chemical, or biological attacks. By limiting the role and utility of nuclear weapons solely to the deterrence of nuclear attacks, an assured retaliation posture is more consistent with the nonproliferation regime, the international norm against the use of nuclear weapons, and long-term disarmament goals, all of which aim to reduce the importance of nuclear weapons in international politics (Sagan, 2009, p. 169, 172, Daalder & Lodal, 2008). Within a nuclear state's bureaucracy, a strict assured retaliation policy that forbids the first use of nuclear weapons could help to check military organizations' bias for offensive operations that often leads to recommendations for preventive or preemptive attacks. An assured retaliation posture, when combined with credible nuclear forces, still presents a clear warning to any nuclear adversaries regarding the likely consequences of using nuclear weapons. However, unlike nuclear "war-fighting" maximalist postures or asymmetric nuclear escalation postures that can encourage the development of relatively large nuclear arsenals, an assured retaliation posture can allow for comparatively smaller nuclear forces, the benefits of which will be discussed in the following section (Daalder & Lodal, 2008; Goldstein, 2000, p. 297).

The Utility of Small, Modern Nuclear Forces

When coupled with a relatively moderate nuclear posture such as assured retaliation, small, modern nuclear forces can fulfill strategic deterrence requirements and reduce, but not eliminate, some of the inherent dangers of nuclear weapons (Glaser, 1998, p. 113, 117-118; Waltz, 2013, p. 17-32; Goldstein, 2000, p. 278, 289-290, 296-298). The deterrence utility of small nuclear forces rests on the absolute power of nuclear weapons to inflict unacceptable damage on an adversary, and not on relative comparisons of nuclear forces; a nuclear state seeking to achieve an assured retaliatory capability does not need to quantitatively match its adversaries (Waltz, 2013, p. 17-32, 39-40, 98-100, 108, 110-111; Jervis, 1979/1980, p. 618; Jervis, 1989, p. 18; Daalder & Lodal, 2008; Goldstein, 2000, p. 262, 283, 289-290). The absolute power of nuclear weapons is reinforced by the fact that unlike conventional weapon systems, nuclear weapons, especially those delivered on ballistic missiles, do not typically engage in battle against each other, which means that technological advancements in one state's nuclear weapons do not automatically negate the effectiveness of another state's nuclear weapons (Waltz, 2013, p. 7-8; Goldstein, 2000, p. 262, 264). The basic requirement for an assured retaliation deterrence strategy is that a state develop a secure, second strike capability, which involves robust command and control over a flexible nuclear force that can survive an adversary's first strike with sufficient weapons to allow for a retaliatory strike at a time of the state's choosing (Waltz, 2013, p. 20; Jervis, 1989, p. 9, 15, 45; Jervis, 1988, p. 89). Small nuclear forces can provide a state with a secure, second strike capability: the compact physical dimensions of nuclear weapons make it relatively easy to ensure their survivability and deliverability; the great destructiveness of nuclear weapons means that even if only a few

weapons survive a first strike, that is sufficient to inflict significant damage on an adversary; robust command and control is not hard with small nuclear forces, and is certainly easier than managing a larger nuclear force (Waltz, 2013, p. 19-21, 110-111). The comparative ease of managing and securing small nuclear forces should not be understated; exercising secure command and control of a force of dozens or hundreds of nuclear weapons is inherently easier than controlling a force of tens of thousands of nuclear weapons, and should translate into a reduced risk of nuclear accidents, inadvertent escalation, unauthorized use, or theft of nuclear weapons by terrorists or other actors (Glaser, 1998, p. 113, 117-118; Waltz, 2013, p. 20-21; Nichols, 2014, p. 85; Goldstein, 2000, p. 278, 296-297). However, even with small arsenals, many of these same dangers will persist and will also depend on other factors such as the stability of nuclear weapons designs and the organizational designs of nuclear deterrent forces (Sagan, 2013, p. 123-124, 150-153). In addition, small nuclear arsenals, by themselves, do not preclude the potential for deterrence failures due to military organizational practices or biases.

When thinking about the size of nuclear deterrent forces, several logical questions present themselves – How many nuclear weapons are needed for an assured retaliation posture? What constitutes a “small” nuclear arsenal versus a “large” arsenal? As several scholars have noted, while nuclear states have expended significant resources on nuclear strategy and planning, there is no uniform formula or standard to determine exactly how many nuclear weapons are needed for deterrence (Narang, 2014, p. 6; Nichols, 2014, p. 90-95). Therefore, while nuclear force planning for a given state will understandably take into account factors such as a state’s threat environment and financial resources available for military spending, the size of a state’s nuclear arsenal that is only meant to assure retaliation can likely also accommodate factors such as nonproliferation and long-term disarmament goals. Due to the absolute power of nuclear

weapons, a nuclear state simply does not need an overabundance of nuclear weapons to benefit from their deterrent value; at the same time, maintaining only modest nuclear forces allows a state to more credibly pursue nuclear nonproliferation and future disarmament policies. A nuclear state that is perceived to possess a relatively small nuclear arsenal, especially if resulting from a state's efforts to reduce its nuclear forces, may be viewed as genuinely committed to nonproliferation and the eventual goal of nuclear disarmament (Daalder & Lodal, 2008; Sagan, 2013, p. 215-217; Knopf, 2012/2013, p. 94; O'Hanlon, 2010, p. 112-113; Nichols, 2014, p. 84-85). A relatively small nuclear arsenal, when combined with an assured retaliation posture that forswears the first use of nuclear weapons, may also reduce some incentives for arms races (Waltz, 2013, p. 28-32; Goldstein, 2000, p. 289).

As noted above, even though technological advancements in one state's nuclear weapons do not automatically negate the effectiveness of another state's nuclear weapons, the constantly evolving nature of military-related technologies means that nuclear states must be prepared to modernize their arsenals on a regular basis in order to maintain a credible nuclear deterrent, just as states regularly modernize and replace conventional military forces (Mearsheimer, 2014, p. 231). In addition, a nuclear state must also be cognizant of non-nuclear technological developments that could affect strategic deterrent relationships (Koblentz, 2014, p. 3). Ballistic missile defenses and advanced conventional weapons are common examples of non-nuclear technologies that could affect the capabilities of nuclear deterrent forces, but future advancements in areas such as cyber warfare and ocean surveillance could also potentially impact nuclear deterrence (Koblentz, 2014, p. 3; Zenko, 2010, p. 7, 23). Admittedly, any state's nuclear force modernization efforts are likely to be criticized internationally, especially by nonnuclear states, as contradictory to the goal of nuclear disarmament. However, given the

distant timeframe and uncertainty regarding a future nuclear disarmament, it is only prudent that existing nuclear states regularly update their nuclear forces in order to maintain an effective deterrent. Prudent nuclear force modernization is also safer than allowing nuclear forces to atrophy. A small nuclear force that becomes outmoded and potentially vulnerable may lead a state to adopt dangerous nuclear practices such as keeping its arsenal on high levels of alert and being prepared to “launch on warning,” which is where a state is prepared to initiate a retaliatory strike upon early notification of a nuclear attack. In contrast, a small nuclear force that remains modern can ensure a state has a flexible and survivable second-strike capability, which in turn can allow for relatively low alert levels and increase the time available for national leaders to assess the nature of any attack. Nuclear forces maintained at low alert levels reduce the chances of nuclear accidents, inadvertent escalation, or unauthorized use (Waltz, 2013, p. 20, 108, 110-111; Goldstein, 2000, p. 296; Glaser, 1998, p. 118). Using the arguments for and against nuclear weapons outlined in chapters 2-3 of this study, Table 1 below compares an assured retaliation posture coupled with small, modern forces versus an asymmetric nuclear escalation posture coupled with large, modern forces:

Table 1: Asymmetric Nuclear Escalation vs. Assured Retaliation

	Asymmetric Escalation + large, modern forces	Assured Retaliation + small, modern forces
Advantages of Nuclear Weapons		
Oriented to deter nuclear attack?	Yes	Yes
Oriented to deter chemical/biological attack?	Yes	No
Oriented to deter conventional attack?	Yes	No
Domestic political advantage?	Possible	Possible
International prestige?	Unlikely	Unlikely

Dangers of Nuclear Weapons and Nonproliferation/Disarmament issues

Mitigates military bias and deterrence failures?	No	Yes
Reduced % of nuclear accidents, unauthorized use, inadvertent escalation?	No	Yes
Reduces specter of nuclear terrorism?	No	Yes
Reduces state rivalries and security dilemma?	No	No
Reduces practical and moral considerations of nuclear retaliation against small states?	No	No
Supports norm against the possession of nuclear weapons?	No	No
Supports norm against the use of nuclear weapons?	No	Yes
Nuclear weapons as irrelevant?	No	No
Limits role and utility of nuclear weapons? (i.e. more consistent with nonproliferation regime and long-term nuclear disarmament goals)	No	Yes

As Table 1 indicates, while an assured retaliation/small force does not provide as much deterrent benefit as an asymmetric escalation/large force, a small nuclear force coupled with an assured retaliation posture has the potential to better address several dangers involving nuclear weapons. Put simply, a small nuclear force focused solely on providing a second strike capability is theoretically safer and more secure than a large nuclear force configured to allow for the first use of nuclear weapons (Waltz, 2013, p. 108; Sagan, 2013, p. 81, 133; Glaser, 1998, p. 117-118). In addition, a small nuclear force with an assured retaliation posture is more consistent with nonproliferation and long-term disarmament goals given that such a force and posture explicitly

limit the role of nuclear weapons in a state's security policy. Given the dynamics of the "security trilemma" and the current international nuclear landscape, a nuclear state that practices "nuclear modesty" with small forces and an assured retaliation posture has the potential, over the long-term, to positively influence other nuclear states to adopt similar nuclear weapons policies (Koblentz, 2014, p. 31). A trend towards such "nuclear modesty" among nuclear states could yield a safer world where nuclear arsenals are relatively small and more secure, and where the mission of nuclear forces is limited to only the most extreme circumstances that imperil a state's security. If and when security conditions within the international system allow for the possibility of nuclear disarmament, any multilateral efforts to negotiate a comprehensive nuclear disarmament treaty will be much easier in a world where the number of nuclear states is as small as possible, the role of nuclear weapons in security policy is as limited as possible, and the number of nuclear weapons in each state's arsenal is as small as possible.

Conclusion

Some nuclear states may be able to develop balanced nuclear weapons policies in order to enjoy the strategic benefits of nuclear deterrence while supporting nonproliferation policies and long-term disarmament goals. Nuclear balance theory does not provide a precise blueprint regarding the ideal nuclear posture and force structure. Rather, this theoretical model provides a general picture of how to meld deterrence, nonproliferation, and disarmament objectives into a coherent strategy that supports the common goal of preventing the future use of nuclear weapons. The next chapter will apply the nuclear balance model to the U.S., a state that in many ways has pursued a balanced nuclear weapons policy in recent years, but one that could make

near-term changes that may, in the long-term, positively influence other nuclear states and reduce the dangers of nuclear weapons to international security.

Chapter 5: CASE STUDY – U.S. NUCLEAR WEAPONS POLICY

This study's primary argument is that a nuclear-armed state can craft a weapons policy that balances the goals of nuclear deterrence with nuclear nonproliferation policy and eventual nuclear disarmament, and that the U.S. has imperfectly pursued such a balanced nuclear weapons policy since the end of the Cold War. In many ways, the U.S. presents an ideal case for the nuclear balance model. The U.S. has long supported efforts to stem the proliferation of nuclear weapons to other states (Gavin, 2015, p. 10; Roberts, 2016, p. 51). As the most powerful state within the international system that currently enjoys conventional military superiority, the U.S. is in a position to further reduce, but not eliminate, the role of nuclear weapons in its security strategy. Given its history as the world's first nuclear state and current status as a leading nuclear power, the U.S. has the potential opportunity to positively influence other nuclear states, over the long-term, towards an international nuclear environment where modest nuclear postures and small forces are the norm. With its extensive nuclear weapons experience, the U.S. has the expertise and resources to maintain smaller and survivable nuclear forces that provide a second-strike capability, even against a rival with a larger nuclear arsenal (Daalder & Lodal, 2008).

Since the beginning of the nuclear age, the U.S. has essentially sought to have it both ways, enjoying the benefits of nuclear deterrence while vigorously working to prevent the proliferation of nuclear weapons to other states (Gavin, 2015, p. 20, 26-27; Hagerty, 1998, p. 195-196). However, with regards to disarmament, even though the general goal of nuclear disarmament has been supported by the U.S. since the 1960s and has been an official U.S. commitment under Article VI of the NPT, the realities of the rivalry with the Soviet Union and the resulting nuclear arms race precluded any serious efforts to disarm during much of the Cold War (O'Hanlon, 2010, p. 6, 12). The emergence of détente in the 1970s and an eventual

improvement of superpower relations in the 1980s allowed the U.S. and Soviet Union to begin the process to vertically disarm, starting with the Strategic Arms Reductions Treaty (START I). The bilateral arms negotiation process with the Soviet Union and now Russia has allowed the U.S. to implement deep cuts to its nuclear arsenal since the end of the Cold War. However, despite these considerable cuts to nuclear arsenals from Cold War levels, the U.S. and Russia today still have the large majority of the world's nuclear inventory, with thousands of nuclear weapons each and plans to maintain these large stockpiles (Kristensen & Norris, 2013, p. 75-79; Zenko, 2010, p. 3; Koblentz, 2014, p. 6-12). Given its still large nuclear arsenal, the U.S. continues to face international criticism that it is not serious about nuclear disarmament and that its nonproliferation policies are inherently hypocritical (Gavin, 2015, p. 26-27, 34; Hagerty, 1998, p. 195-196; Sagan, 2013, p. 217; Daalder & Lodal, 2008; Nichols, 2014, p. 116). At the same time, it would be unrealistic to expect the U.S. to completely disarm anytime soon given the reality that nearly every other nuclear state currently plans to maintain its nuclear forces, with several actively increasing and modernizing their arsenals; the U.S. will maintain a strategic nuclear deterrent for the foreseeable future. The uncertain prospects and timeline for nuclear disarmament lead some observers to conclude that the U.S. and other nuclear states should only focus on nuclear deterrence requirements and abandon any serious notion of disarmament (Waltz, 2013, p. 108, 220-224). However, that would be a mistake that would negatively impact U.S. nonproliferation objectives. In the coming years, the U.S. has the opportunity to take leadership of global nuclear disarmament efforts and bolster its nonproliferation policies, while at the same time maintaining strategic deterrence requirements, by modifying its nuclear posture and further reducing the size of its nuclear arsenal. Such changes along with qualitative improvements could lead to a U.S. nuclear force that is safer and more operationally effective.

In considering these changes towards a more balanced nuclear weapons policy, the U.S. would need to take into account the perspectives of Russia and China given the U.S.–Russian–Chinese “security trilemma” (Koblentz, 2014, p. 20-21). In addition, the U.S. would need to consider the security needs of its allies and partners that currently rely on U.S. extended nuclear deterrence, the danger of asymmetric nuclear escalation by other nuclear states, especially regional challengers such as North Korea, and non-nuclear military technologies that could directly affect nuclear deterrence requirements. This chapter will first examine the comprehensive nature of U.S. support to nuclear nonproliferation, followed by sections that discuss the evolution of U.S. nuclear posture and force structure since the end of the Cold War, as well as the contemporary nuclear environment facing the U.S. This chapter will then provide policy recommendations for further changes to U.S. nuclear posture, deterrent force structure, and efforts regarding key non-nuclear military technologies such as missile defense and advanced conventional weapons.

U.S. Enduring Support to Nuclear Nonproliferation

Since the beginning of the nuclear era and more than any other nuclear state, the U.S. has vigorously pursued the nonproliferation of nuclear weapons as a distinct pillar of its national security strategy. Nuclear nonproliferation has been as important to the U.S. as other strategic goals such as the containment of the Soviet Union and the establishment of a rules-based and open international order (Gavin, 2015, p. 9-19). As Sagan (2013) notes, the basic rationale for U.S. nonproliferation efforts is logical and based on self-interest – “it is not difficult to understand why a large nuclear state, with the most powerful conventional forces in the world, would want to limit severely the spread of nuclear weapons to other states in the international system” (p. 132). Gavin (2015) describes U.S. nonproliferation policies as “strategies of

inhibition [that] were developed to stem the power-equalizing effects of nuclear weapons and [that] have been motivated by the desire of the United States to safeguard its security and preserve its dominant power” (p. 20). Despite having built a massive nuclear deterrent force during the Cold War, the U.S. has pursued nonproliferation out of concern that more nuclear states in the international system could eventually mean that the U.S. would suffer a future nuclear attack with catastrophic effects. The U.S. has also been concerned that other nuclear states’ catalytic nuclear postures could force the hand of American policymakers and compel U.S. military intervention during regional disputes; nuclear-armed states, including allies of the U.S., would also have an increased measure of political independence that may not serve U.S. interests. Nuclear proliferation by one state could lead to “nuclear tipping points” that trigger additional states to acquire nuclear weapons (Gavin, 2015, p. 20-23). Most importantly, the U.S. has steadfastly supported nuclear nonproliferation out of a desire to maintain its power projection capability; “U.S. policymakers have fully appreciated the power of nuclear deterrence, but have feared that nuclear weapons could be used to deter the United States and limit its freedom of action, both regionally and in the world at large” (Gavin, 2015, p. 22). As noted in chapter two of this study, Waltz (2013) bluntly writes “A big reason for America’s resistance to the spread of nuclear weapons is that if weak countries have some they will cramp our style. Militarily punishing small countries for behavior we dislike would become much more perilous” (p. 100). Small states armed with nuclear weapons also might become more bellicose and may have significant challenges managing the dangers of nuclear accidents, unauthorized use, inadvertent escalation, and nuclear terrorism (Gavin, 2015, p. 23-24).

The U.S. has employed a variety of tools to support its nonproliferation policies. These efforts have included “legal/normative measures – lofty rhetoric, treaties, and regimes – to

highlight the dangers of nuclear weapons and to encourage a norm against their possession and a taboo against their use” (Gavin, 2015, p. 25). These efforts directly support U.S. security interests; “The use of a nuclear weapon anywhere by anyone threatens U.S. national security by erasing the nuclear taboo. Due to its overwhelming conventional military capabilities, the United States benefits disproportionately from continuing the tradition of the nonuse of nuclear weapons” (Koblentz, 2014, p. 5). As noted earlier in this chapter, such U.S. legal or normative efforts have been criticized as hypocritical given the U.S.’s enduring nuclear weapons capabilities (Gavin, 2015, p. 26-27, 34; Hagerty, 1998, p. 195-196; Daalder and Lodal, 2008; Sagan, 2013, p. 217). The U.S. has also considered and at times utilized a number of coercive tools such as “sanctions, sabotage, threats of abandonment, and even preventive military strikes against nascent nuclear programs” (Gavin, 2015, p. 27). It is notable that the U.S. has not applied coercive techniques solely to adversaries; a broad range of U.S. allies and partners such as Taiwan, South Korea, Japan, West Germany, Italy, and Australia have also been subject to U.S. coercive pressure to not build nuclear arsenals (Gavin, 2015, p. 29). Lastly, the U.S. has employed assurance measures such as security guarantees and military assistance to satisfy the security needs of a variety of states and reduce the incentives for nuclear proliferation (Gavin, 2015, p. 29-30). Gavin (2015) notes the unprecedented nature of U.S. security agreements in the nuclear age:

Before 1950 the United States had always gone to great lengths to avoid entangling alliances, deploying forces abroad, or maintaining large military forces during peacetime... As the Cold War confrontation with the Soviet Union emerged, the United States entered into a series of alliances and provided explicit and implicit security guarantees to a range of countries... a key element of these arrangements was to connect

the military capabilities of the United States, particularly its nuclear forces, to the defense of these countries...these security arrangements in the nuclear age are unlike traditional, pre-nuclear age alliances, which tended to be threat specific, additive, and temporary.

(p. 30-31)

Security alliances such as NATO and other U.S. security agreements with allies in Asia include extended nuclear deterrence guarantees that are configured to deter adversary aggression, but such arrangements also significantly reduce the need for U.S. allies to consider acquiring their own nuclear weapons. These enduring U.S. security alliances continue to support U.S. nonproliferation policy (Gavin, 2015, 30-31; O'Hanlon, 2010, p. 72-78; Roberts, 2016, p. 220; Sagan, 2009, p. 167). Overall, U.S. nonproliferation efforts have been a significant factor in keeping the number of nuclear weapons states in the international system relatively low. Even with states that have still decided to acquire a nuclear weapons capability, the U.S. has worked to limit the scope and development of these new nuclear weapons programs (Gavin, 2015, p. 11, 37, 43).

U.S. Nuclear Posture and Deterrent Force Structure since the end of the Cold War

Since the end of the Cold War and in response to a changing security environment, the U.S. has instituted changes to its nuclear posture and deterrent force structure that have involved major reductions in the size of the U.S. nuclear arsenal and an eventual reduction in the role of nuclear weapons (Roberts, 2016, p. 40-41, 47-48). At the tail end of the Cold War, the U.S. nuclear stockpile had over 20,000 weapons, including strategic nuclear warheads employed on delivery systems such as ICBMs, submarine-launched ballistic missiles (SLBMs), and strategic bombers, as well as nonstrategic nuclear weapons (NSNWs) located in Europe and Asia. A

robust U.S. nuclear enterprise built during the Cold War directly supported the U.S. arsenal through continuous modernization of weapons systems; in addition, the U.S. government had a well-funded cadre of nuclear experts across several departments to inform and support nuclear policy-making (Roberts, 2016, p. 11-14). At the time, the U.S. had a “war-fighting” nuclear strategy based on Reagan-era guidance – “The most fundamental national security objective is to deter direct attack... Should nuclear attack nonetheless occur, the United States and its allies must prevail... we must be prepared to wage war successfully” (as cited in Roberts, 2016, p. 12; Bernstein, 2014, p. 81).

The George H. W. Bush Administration

Changes to U.S. nuclear posture and force size began in 1991 under President George H. W. Bush’s Presidential Nuclear Initiatives (PNIs), which were unilateral directives not subject to an international treaty. President Bush’s changes included the re-deployment of many land-based NSNWs and all sea-based NSNWs back to the U.S., a reduction in alert status of all manned bombers and some ICBMs, and cancellation of research and development of several nuclear delivery systems, including the U.S. mobile ICBM program (Roberts, 2016, p. 14; Nichols, 2014, p. 41-42; Daalder and Lodal, 2008). While the U.S. PNIs were unilateral, the Soviet Union and then Russia did respond positively by instituting similar changes to its nuclear forces (Roberts, 2016, p. 14-15; Daalder and Lodal, 2008). Separately, in 1991 the U.S. and Russia also signed the START I treaty, which reduced deployed strategic warheads to 6,000 weapons for each side (Roberts, 2016, p. 15; Nuclear Threat Initiative, 2016). U.S. efforts with Russia to reduce nuclear arsenals were motivated in part by U.S. concerns over Russian nuclear

security problems and the danger of Russian “nuclear leakage” of materials or even weapons (Roberts, 2016, p. 14-15; Bernstein, 2014, p. 82).

While making these significant reductions in the number of U.S. nuclear weapons, the Bush administration did expand the role of nuclear weapons to some extent by developing the policy of “calculated ambiguity” in the wake of the 1991 Persian Gulf War and as a response to concerns over regional challengers armed with chemical and biological weapons. The policy of “calculated ambiguity” involved the U.S. making opaque statements as to how the U.S. might respond if attacked with chemical or biological weapons, with the notion being that a potential adversary could be deterred from using chemical or biological weapons due to the possibility of a U.S. nuclear response. Intentional opacity was also meant to provide flexibility for U.S. presidents in how to respond actually to chemical or biological attacks (Nichols, 2014, p. 55-57; Roberts, 2016, p. 14-15; Bernstein, 2014, p. 82).

The Clinton Administration

The Clinton administration’s nuclear weapons policies were primarily a continuation of previous administrations, with steady progress on nuclear weapons reductions and moderate changes to U.S. nuclear strategy. The 1994 Nuclear Posture Review (NPR) stated that the U.S. approach to nuclear weapons would be to “lead and hedge,” which essentially meant the U.S. would seek additional nuclear weapons reductions with Russia while retaining the ability to rebuild a larger nuclear force should a deterioration of the geopolitical environment require a more robust deterrent (Bernstein, 2014, p. 83-84; Roberts, 2016, p. 16-17). The 1994 NPR stated the primary purpose for the U.S. nuclear force was “to deter any future hostile leadership with access to strategic nuclear forces from acting against our vital interests and to convince it that

seeking a nuclear advantage would be futile” (as cited in Roberts, 2016, p. 17). As a continuation of the Bush administration’s nuclear posture changes and weapons reductions, the 1994 NPR noted the following developments involving the U.S. arsenal:

No nuclear weapons were in the custody of U.S. ground forces. Naval nonstrategic nuclear forces were no longer deployed at sea. Strategic bombers had been taken off of day-to-day alert. The total active warhead stockpile had been reduced 50 percent. The number of deployed strategic warheads had been reduced 47 percent. The number of deployed nonstrategic nuclear weapons had been reduced by about 90 percent, as had the number of U.S. nuclear weapons in the NATO stockpile... Many delivery systems in development at the end of the Cold War had been terminated, including a new small ICBM and various new tactical missiles. The deployment of some new systems had been truncated, including the Peacekeeper ICBM, the B-1 and B-2 bombers, and a new submarine ballistic missile warhead. The planned number of ballistic missile submarines was also reduced from twenty-four to eighteen. Multiple weapons systems had been retired without replacement, including nuclear artillery projectiles and nuclear depth bombs. Spending on U.S. strategic nuclear forces had been reduced from \$47.8 billion in 1984 to \$13.5 billion in 1994. (Roberts, 2016, p. 17-18)

The 1994 NPR also highlighted the continuing concern over regional challengers who might use chemical, biological, or nuclear weapons, and retained the U.S. nuclear first use option (Bernstein, 2014, p. 84). During the Clinton administration, senior officials reinforced the policy of “calculated ambiguity” regarding the deterrence of chemical and biological attacks; in 1998, Secretary of Defense William Cohen stated “We think that the ambiguity involved in the issue of [U.S.] nuclear weapons contributes to our own security... keeping any potential adversary who

might use either chemical or biological [weapons] unsure of what our response would be” (as cited in Nichols, 2014, p. 56; as cited in Sagan, 2009, p. 169-170). However, some officials seemingly disregarded “calculated ambiguity” by making explicit U.S. nuclear threats to deter chemical and biological attacks. In 1996 senior Clinton administration officials made direct references to the use of nuclear weapons to target Libya’s chemical weapons program (Bernstein, 2014, p. 85; Sagan, 2000, p. 102-103). In 1998, General Eugene Habiger, the Commander of the U.S. Strategic Command, stated “We now have a policy that’s articulated that says nuclear weapons will be used in response to rogue states using weapons of mass destruction” (as cited in Sagan, 2000, p. 104). In late 1997, the Clinton administration had issued new nuclear planning guidance with Presidential Decision Directive (PDD) 60, which ordered the Defense Department to conduct planning for the use of nuclear weapons against potential regional challengers that might have chemical, biological, or nuclear weapons; PDD 60 also maintained the U.S. doctrine that allowed for the first use of nuclear weapons (Bernstein, 2014, p. 85-86; Nichols, 2014, p. 53-54). PDD 60 did shift away from previous Reagan-era nuclear “war-fighting” guidance; a Clinton administration official explained that PDD 60 “removes from presidential guidance all previous references to being able to wage a nuclear war successfully or to prevail in a nuclear war... The emphasis in this PDD is therefore on deterring nuclear wars or the use of nuclear weapons at any level, not fighting [with] them” (as cited in Bernstein, 2014, p. 85). In terms of other nuclear-related issues, the Clinton administration supported the indefinite extension of the NPT in 1995 and the beginning of a renewed U.S. effort to develop missile defenses, which was driven in large part by ballistic missile advancements by regional challengers (Roberts, 2016, p. 18-19). Roberts (2016) also notes that towards the end of the Clinton administration, the U.S.

government had re-organized and disbanded several nuclear-related agencies, which detrimentally affected overall U.S. efforts to develop nuclear strategy (p. 19).

The George W. Bush Administration

As with previous post-Cold War administrations, the new Bush administration continued efforts to reduce the size of the U.S. nuclear arsenal, but its nuclear weapons policies maintained a large role for nuclear weapons and the administration also put forth proposals involving nonnuclear military capabilities with potential implications for strategic stability with other nuclear powers. As a result of the September 11th terrorist attacks, the Bush administration recalibrated its national security strategy towards a more offensive mindset – “it put emphasis on what it saw as the urgent need to confront gathering threats ‘at the crossroads of radicalism and technology... History will judge harshly those who saw this coming danger but failed to act. In the new world we have entered, the only path to peace and security is the path of action’” (Roberts, 2016, p. 21; Bernstein, 2014, p. 86). The Bush administration’s 2001 NPR was classified, but portions eventually became public; it developed the concept of a “New Triad” that consisted of nuclear and advanced conventional weapons, strategic defenses, and a “revitalized defense infrastructure that will provide new capabilities in a timely fashion to meet emerging threats” (as cited in Sagan & Vaynman, 2011, p. 19; Nichols, 2014, p. 64-65; Roberts, 2016, p. 23). The 2001 NPR maintained an enduring and broad role for nuclear weapons – “U.S. nuclear forces still require the capability to hold at risk a wide variety of target types. This capability is key to the role of nuclear forces in supporting an effective deterrence strategy relative to a broad spectrum of potential opponents under a variety of contingencies. Nuclear attack options that vary in scale, scope, and purpose will complement other military capabilities” (as cited in Sagan

& Vaynman, 2011, p. 19). The 2001 NPR reflected a pessimism regarding the ability to deter “rogue” states and terrorists, while recognizing the value of deterrence and strategic stability with other major nuclear states (Nichols, 2014, p. 63, 71-72; Roberts, 2016, p. 22-23). The 2001 NPR specifically identified Iraq, Iran, Syria, Libya, and North Korea as adversaries subject to U.S. nuclear contingency planning, with China as a “potential adversary” (Sagan & Vaynman, 2011, p. 20; Roberts, 2016, p. 23; Nichols, 2014, p. 63). The 2001 NPR called for new nuclear weapons capabilities against challenging targets such as underground facilities, increased ballistic missile defenses, and advanced conventional weapons that could conduct attacks at global distances (Sagan & Vaynman, 2011, p. 19-20; Bernstein, 2014, p. 87; Nichols, 2014, p. 66, 68).

The Bush administration faced significant criticism from both domestic and international audiences for the policies set forth in the 2001 NPR. The proposals involving new nuclear weapons capabilities were controversial in part due to concerns over the impact on the nuclear nonproliferation regime and were not supported by Congress (Roberts, 2016, p. 24-25; Bernstein, 2014, p. 88; Nichols, 2014, p. 68). Congress also opposed Bush administration plans to utilize conventionally-armed ballistic missiles to develop a long range advanced conventional strike capability known as “Prompt Global Strike” (PGS); such a delivery system was controversial in that it could decrease strategic stability with other nuclear states and increase the danger of inadvertent nuclear escalation since other nuclear states might have difficulties differentiating a conventional ballistic missile attack from a nuclear attack (Roberts, 2016, p. 25; Nichols, 2014, p. 65-67; Zenko, 2010, p. 17-19). China reacted negatively to the 2001 NPR’s “inclusion of China on the short list of seven countries against which the United States had to be prepared to use nuclear weapons in an ‘immediate or potential contingency’... Beijing did not like being

grouped with “rogue” states deemed hostile to the United States...” (Fingar, 2011, p. 52). Sagan and Vaynman (2011) reference a 2006 SAIC study that “found that most states (including key U.S. allies) criticized the 2001 NPR for increasing the role of nuclear weapons, blurring the line between conventional and nuclear weapons, and making nuclear weapons more usable” (p. 25). This SAIC study also conveyed a recommendation regarding U.S. disarmament and nonproliferation policies – “from close U.S. allies, their final message for U.S. officials is that a greater U.S. readiness to engage on nuclear disarmament issues would pay off in increased support from other third parties in pursuing U.S. non-proliferation objectives” (as cited in Sagan & Vaynman, 2011, p. 26). U.S. allies also reacted negatively to the fact that the 2001 NPR was essentially a unilateral U.S. government review of nuclear issues with little input from outside parties. U.S. allies requested more dialogue and transparency with the U.S. on issues of nuclear weapons policy (Sagan & Vaynman, 2011, p. 26).

The Bush administration also displayed a proclivity towards unilateralism in its willingness to break from the traditional framework of bilateral arms control treaties between the U.S. and Russia. The U.S. withdrew from the Antiballistic Missile (ABM) Treaty in 2002 in order to move forward with national missile defense plans; such a move was invariably controversial with other nuclear states such as Russia and China, who have viewed U.S. missile defense efforts as potentially jeopardizing their nuclear deterrents (Roberts, 2016, p. 23; Koblentz, 2014, p. 21-22; Podvig, 2011, p. 42-44). The 2001 NPR recommended further cuts to the U.S. nuclear arsenal that President Bush accepted in November 2001; while referencing the NPR’s recommendation, President Bush stated in mid-2002 that “I recognized that it would be preferable for the United States to make such reductions on a reciprocal basis with Russia, but that the United States would be prepared to proceed unilaterally” (as cited in Roberts, 2016, p.

24). The U.S. and Russia did reach a new nuclear arms agreement with the Strategic Offensive Reductions Treaty (SORT), also referred to as the Moscow Treaty, which set new limits to deployed strategic nuclear warheads of 1,700 to 2,200 weapons for each side; Roberts (2016) concludes that “Essentially, the treaty reflected changes to the U.S. stockpile that the Bush administration was making unilaterally, which the Russians then joined in a legally binding framework” (p. 24).

Towards the end of the Bush administration, a serious lapse in nuclear security raised questions about the operational viability of the U.S. nuclear deterrent. In 2007, a B-52 strategic bomber unknowingly transported six nuclear warheads for cruise missiles from North Dakota to Louisiana (Sagan, 2013, p. 71; Nichols, 2014, p. 72-73; Roberts, 2016, p. 25). Sagan (2013) notes that one investigation of this nuclear incident found that:

Over time, military technicians became sloppy, procedures were rushed, and shortcuts became routinized. Requirements to identify nuclear-inert missiles with placards on multiple sides of the pylons and orange cones, for example, had at Minot [air base] been reduced to an 8x10 piece of paper placed somewhere on the pylon. Other verification measures, such as checking serial numbers, were simply not followed. (p. 71)

The two most senior Air Force officials were removed from their positions due to this nuclear security incident. Nichols (2014) argues this incident was indicative of a broader lack of attention on nuclear weapons issues within the U.S. national security establishment – “the government was no longer developing experts on nuclear matters. Once the Cold War was over, military officers ceased receiving any graduate education in either the general subject of nuclear strategy or about U.S. nuclear doctrine in particular” (p. 73). Roberts (2016) argues that the 2007 nuclear security incident was reflective of a general malaise within U.S. nuclear forces that

included “a significant loss of leadership focus and institutional excellence for nuclear deterrence” (p. 25).

The Obama Administration, the 2010 NPR, and International Reactions

The Obama administration’s nuclear policies have sought to link deterrence requirements, nonproliferation efforts, and disarmament goals, which have led to a continuation of efforts to reduce the number of U.S. nuclear weapons, but have also included a shift in declaratory posture to reduce the role of nuclear weapons. President Obama renewed the U.S.’s intent to support the long-term objective of global nuclear disarmament during his famous 2009 speech in Prague, but he also noted that the U.S. would have to maintain a viable nuclear deterrent for the foreseeable future (U.S. Department of Defense, 2010, p. iii; Roberts, 2016, p. 29; Bernstein, 2014, p. 89-90; Nichols, 2014, p. 74-75). The Obama administration’s renewed focus on nuclear disarmament was enabled in part by public efforts of former U.S. senior officials such as Senator Sam Nunn and Secretaries William Perry, Henry Kissinger, and George Shultz, who as the “Gang of Four” wrote several articles in 2007 and 2008 that called for the U.S. to lead efforts towards the long-term goal of nuclear disarmament (Roberts, 2016, p. 26-27, 29; Nichols, 2014, p. 73).

Unlike the 2001 NPR, the Obama administration’s 2010 NPR is unclassified in its entirety in order to promote transparency and involved consultations with U.S. allies as well as a number of other state and non-state actors (Roberts, 2016, p. 31; Sagan & Vaynman, 2011, p. 26). Unlike previous NPRs, the 2010 NPR prioritizes the issues of nuclear terrorism, nonproliferation, and disarmament, while still emphasizing deterrence, strategic stability, and extended nuclear deterrence for U.S. allies (Sagan & Vaynman, 2011, p. 19-20; U.S. Department

of Defense, 2010, p. v, 2; Bernstein, 2014, p. 90-91). The 2010 NPR explicitly links U.S. nuclear disarmament efforts with initiatives to counter nuclear proliferation and nuclear terrorism:

U.S. arms control and disarmament efforts, as well as other means of reducing the role of nuclear weapons and moving toward a world without them, can make a major contribution to our goal of preventing nuclear proliferation and nuclear terrorism. *By demonstrating that we take seriously our NPT obligation to pursue nuclear disarmament, we strengthen our ability to mobilize broad international support for the measures needed to reinforce the non-proliferation regime and secure nuclear materials worldwide* [emphasis added]. (U.S. Department of Defense, p. 12; Sagan & Vaynman, 2011, p. 17, 23)

As a way to reduce the role of nuclear weapons, the 2010 NPR includes a significant modification of U.S. declaratory posture for nonnuclear states that largely, but not completely, moves away from the “calculated ambiguity” policy to deter chemical and biological attacks:

The fundamental role of U.S. nuclear weapons, which will continue as long as nuclear weapons exist, is to deter nuclear attack on the United States, our allies, and partners. During the Cold War, the United States reserved the right to use nuclear weapons in response to a massive conventional attack by the Soviet Union and its Warsaw Pact allies. Moreover, after the United States gave up its own chemical and biological weapons (CBW)... it reserved the right to employ nuclear weapons to deter CBW attack on the United States and its allies and partners... 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 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 states that are party to the NPT and in compliance with their nuclear non-proliferation obligations* [emphasis added]. (U.S. Department of Defense, 2010, p. vii-viii, 15-16; Sagan & Vaynman, 2011, p. 19-21, 23; Roberts, 2016, p. 32; Bernstein, 2014, p. 91)

This language referencing nuclear nonproliferation compliance is a deliberate attempt to encourage states to become or remain compliant with the NPT (Sagan & Vaynman, 2011, p. 21-22; U.S. Department of Defense, 2010, p. viii, 15). The 2010 NPR warns that any chemical or biological attack on the U.S. or its allies would invite a “devastating conventional military response” and also provides a signal regarding the future development of biological weapons: “Given the catastrophic potential of biological weapons and the rapid pace of bio-technology development, the United States reserves the right to make any adjustment in the assurance that may be warranted by the evolution and proliferation of the biological weapons threat and U.S. capacities to counter that threat” (Sagan & Vaynman, 2011, p. 25; U.S. Department of Defense, 2010, p. viii, 16). Despite this significant change to U.S. declaratory nuclear doctrine that reduces the role of nuclear weapons, the modified “negative security assurance” in the 2010 NPR does not equate to a no-first-use (NFU) nuclear posture:

In the case of countries not covered by this assurance – states that possess nuclear weapons and states not in compliance with their nuclear non-proliferation obligations – there remains a narrow range of contingencies in which U.S. nuclear weapons may still play a role in deterring a conventional or CBW attack against the United States or its

allies and partners. *The United States is therefore not prepared at this present time to adopt a universal policy that deterring nuclear attack is the sole purpose of nuclear weapons, but will work to establish conditions under which such a policy could be safely adopted [emphasis added].* (U.S. Department of Defense, 2010, p. viii, 16; Sagan & Vaynman, 2011, p. 23; Roberts, 2016, p. 32; Bernstein, 2014, p. 91; Nichols, 2014, p. 80)

The language of the modified “negative security assurance” is interpreted to be referring, in part, to states such as North Korea. Using the Korean peninsula as an example, the fact that the U.S. is reluctant to adopt a NFU posture is based on the view that U.S. nuclear weapons may continue to have deterrence utility relevant to North Korean non-nuclear attack scenarios, as well as a reassurance function for U.S. allies such as South Korea and Japan (Huntley, 2013, p. 307-308; Roberts, 2016, p. 32; Bernstein, 2014, p. 91). Indeed, the 2010 NPR emphasizes that the U.S. remains dedicated to providing extended nuclear deterrence to its allies to support broader regional deterrence requirements and preclude U.S. allies from acquiring independent nuclear deterrents (U.S. Department of Defense, 2010, p. xii-xiv, 31-35).

In contrast to the 2001 NPR, the 2010 NPR discusses China within the same general context as Russia. The 2010 NPR emphasizes strategic stability and dialogue as key elements of the U.S. relationships with Russia and China that can lay the groundwork for future multilateral nuclear arms negotiations (Sagan & Vaynman, 2011, p. 22-23; Roberts, 2016, p. 32-33; U.S. Department of Defense, 2010, p. 4-5, 28-29). As noted in the 2010 NPR, the Obama administration demonstrated its commitment to the traditional framework of bilateral arms negotiation with Russia by signing the New START treaty in 2010; this new treaty provided for further nuclear reductions with limits of 1,550 deployed strategic nuclear warheads for each country by 2018 (Roberts, 2016, p. 33; Zenko, 2010, p. 3; U.S. Department of Defense, 2010, p.

20-21, 30). The Obama administration has expressed interest in negotiating an additional nuclear arms control agreement with Russia, possibly reducing the number of deployed strategic warheads to 1,000 weapons for each side (Zenko, 2010, p. 6; U.S. Department of Defense, 2010, p. 30; Roberts, 2013, p. 36; Bernstein, 2014, p. 92). Notably, the 2010 NPR continued to voice strong support for the development of U.S. ballistic missile defenses and briefly mentioned the possibility of the U.S. fielding of PGS capabilities involving conventionally-armed ballistic missiles, both issues of continuing concern to both Russia and China (U.S. Department of Defense, 2010, p. 20, 25; Huntley, 2013, p. 307; Zenko, 2010, p. 13-19; Koblentz, 2014, p. 22).

Sagan and Vaynman (2011) argue that U.S. declaratory policies such as the NPR are relevant and accurate depictions of U.S. nuclear posture, and conclude that the 2010 NPR has had some positive influence with other nuclear and nonnuclear states (p. 28-29, 238). Sagan and Vaynman (2011) answer the questions “why should what the United States *says* it will do matter for other states? Why would other governments believe that the NPR is a credible signal?” by arguing that a U.S. administration would pay a significant political price for disregarding or reversing a position that had been articulated in an NPR, and that U.S. declaratory nuclear doctrine invariably drives U.S. military planning and does offer insight on U.S. strategic thinking (p. 28-29). U.S. declaratory policies such as the NPR may influence other states by affecting security calculations, defining “norms of appropriateness and responsibility” regarding state behavior involving nuclear weapons, providing support to like-minded domestic actors within other states, and “creating a bargaining dynamic” conducive for nonproliferation and disarmament efforts (Sagan & Vaynman, 2011, p. 18, 27-32). Sagan and Vaynman (2011) note “International responses to the NPR may be difficult to observe and evaluate, in part because

international reactions are likely to evolve slowly. We should not expect that governments will change their nuclear postures and policies overnight” (p. 18).

In some cases, though, international reactions to the 2010 NPR were relatively quick and discernable; for example, within months of the 2010 NPR, the United Kingdom adopted a nuclear strategy that was very comparable to the updated U.S. nuclear posture (Sagan & Vaynman, 2011, p. 241). NATO members generally responded favorably to the 2010 NPR, but from different perspectives – “For the Eastern Europeans, it is the affirmation of reassurance, even though nuclear abolition remains the final goal. For disarmament-willing NATO members, it is the encouragement to walk forward – cautiously – on the disarmament path” (as cited in Sagan & Vaynman, 2011, p. 252; Muller, 2011, p. 121). The 2010 NATO doctrine was consistent with the 2010 NPR in expressing a desire to reduce the role of nuclear weapons in NATO security strategy; the language of the 2010 NATO doctrine deemphasizing nuclear weapons was significantly different from the previous NATO doctrine issued in 1999 (Sagan & Vaynman, 2011, p. 252-253). Japan and South Korea also responded favorably to the 2010 NPR, in no small part due to the Obama administration’s considerable efforts at sustained dialogue with these allies in order to reassure them that the modified “negative security assurance” did not weaken the U.S. commitment to provide extended nuclear deterrence (Sagan & Vaynman, 2011, p. 250-251). As noted earlier, the provisions of the 2010 NPR’s “negative security assurance” exclude states such as North Korea.

Russia reacted positively to the 2010 NPR and more generally to the U.S.’s overall nuclear policy efforts – “policies set before and during the NPR consultation process deeply influenced the [Russian] government’s perception of its security environment and strengthened the hand of moderates in Moscow in the ensuing domestic debate over Russia’s nuclear weapons

posture and nonproliferation policy” (Sagan & Vaynman, 2011, p. 241). To Russia, the 2010 NPR was a signal the U.S. was willing to discuss many strategic topics, including contentious issues such as missile defense and advanced conventional weapons (Podvig, 2011, p. 40, 44-46). Podvig (2011) notes “the changes in U.S. nuclear policy, as they were outlined in the NPR and were translated into specific steps in U.S.-Russian relations, created an environment in which officials in Russia could be more responsive to nuclear proliferation and other U.S. security concerns” (p. 40). The 2010 NPR and the U.S.’s overall nuclear policy efforts to reduce the role of nuclear weapons appear to have influenced the Russian nuclear doctrine review process. Initial versions of the 2010 Russian nuclear doctrine referred to nuclear weapons having a broad set of missions, including a role for nuclear weapons to be used for preventive attacks, but the final version of the 2010 doctrine contained no references to preventive strikes and reflected an overall reduction in the role of Russian nuclear weapons (Sagan & Vaynman, 2011, p. 242; Podvig, 2011, p. 46-48). The 2010 Russian nuclear doctrine still allows for the Russian use of nuclear weapons to retaliate against nuclear, biological, and chemical attacks on Russia, as well as major conventional attacks that threaten Russian sovereignty; nonetheless, the 2010 nuclear doctrine “substantially narrowed the range of circumstances in which Moscow would consider using nuclear weapons” when compared to the previous Russian doctrine from 2000 (Podvig, 2011, p. 47; Sagan & Vaynman, 2011, p. 242; Koblentz, 2014, p. 12).

However, the 2010 NPR had far less impact with a number of other states such as France, India, Pakistan, and China (Sagan & Vaynman, 2011, p. 238). France strongly opposes the notion of nuclear disarmament and remains firmly wedded to maintaining a nuclear weapons capability: “Nuclear weapons have come to be a matter of French identity in the eyes of the political class. The unambiguous commitment of President Obama to the vision of nuclear

abolition thus threatened a core French value” (as cited in Sagan & Vaynman, 2011, p. 246; Muller, 2011, p. 108). Indian and Pakistani nuclear strategies currently are not likely to be significantly influenced by the U.S. since the two countries’ security calculus is driven by their long-standing rivalry, with India also focused on the perceived threat from China (Sagan & Vaynman, 2011, p. 243-244). Even though India has a long history of supporting the notion of global nuclear disarmament, it is currently reluctant to engage in any multilateral nuclear arms reduction process without much deeper nuclear reductions from the large nuclear states, a position that is generally shared by China; “‘Get down to our level, and then we can talk,’ is in effect the new Indian mantra” (Sagan & Vaynman, 2011, p. 245; Roberts, 2016, p. 151-152). Overall, China’s reaction to the 2010 NPR was focused more on what it perceived as the negative aspects of the review, even though Chinese observers noted the 2010 NPR was more positive towards China than the 2001 NPR (Fingar, 2011, p. 51-52; Sagan & Vaynman, 2011, p. 243). Fingar (2011) notes that U.S.-China relations were tense at the time and China’s view of the 2010 NPR was affected by “the conviction that the United States is determined to constrain China’s ability to challenge U.S. hegemony” (p. 51). While acknowledging the 2010 NPR’s modified “negative security assurance,” many Chinese observers focused on criticizing the U.S. for not adopting a NFU doctrine, noting that China had consistently declared a NFU doctrine since the beginning of the Chinese nuclear weapons program; “Most of the comparisons between the new U.S. position and China’s long-standing policy seem intended to reassert Beijing’s claim to the moral high ground...” (Fingar, 2011, p. 57, 60-61). China’s primary concerns revolve around the 2010 NPR’s references to ballistic missile defense efforts and advanced conventional military capabilities, which China views as a U.S. effort to gain leverage over China by

potentially threatening its nuclear capabilities (Fingar, 2011, p. 58-62; Sagan & Vaynman, 2011, p. 243).

Current U.S. Nuclear Force Structure and Operational Readiness

Overall, despite major reductions in the number of U.S. nuclear weapons since the end of the Cold War, the U.S. arsenal still has thousands of warheads in its inventory. The U.S. strategic nuclear force today is essentially a smaller version of its Cold War predecessor, with some delivery vehicles dating back to the early 1960s. The U.S. strategic “nuclear triad” consists of approximately 1,600 warheads deployed on over 400 Minuteman III ICBMs, nearly 300 Trident II D5 SLBMs, and approximately 100 B-2 and B-52 strategic bombers. In terms of nonstrategic nuclear forces, the U.S. maintains approximately 200 B61 bombs deployed in Europe, with several hundred additional B61 bombs stored in the U.S. In addition to deployed nuclear weapons, the U.S. maintains a reserve of over 2,000 weapons and has over 2,000 additional weapons scheduled for dismantlement (Koblentz, 2014, p. 7-9; Woolf, 2016, March 10; Woolf, 2016, March 23).

In terms of nuclear force operational readiness, the U.S. faces critical challenges involving both equipment and personnel. The modernization of U.S. nuclear forces largely ceased with the end of the Cold War. Roberts (2016) notes that “today, the *newest* ICBM in the existing force was placed in the ground in 1971... The *newest* B-52 in the existing force came into service in 1962... The *newest* U.S. nuclear warhead went into service in 1989... although the forces are maintained adequately to ensure operational effectiveness today, they are also aging well past their original intended service lives” (p. 43). The Obama administration has put forth proposals that would comprehensively modernize U.S. nuclear forces over the next several

decades, and would include new strategic bombers, air-launched cruise missiles, ICBMs, and ballistic missile submarines (SSBN), as well as upgrades to the supporting nuclear industrial enterprise such as the national laboratories. The cost of U.S. nuclear modernization is a significant challenge given ongoing U.S. fiscal austerity and is made all the more daunting by the fact that every major component of U.S. nuclear forces will require upgrades and eventual replacements during the same general timeframe; a 2014 study found that the U.S. may end up spending approximately \$1 trillion dollars on nuclear modernization efforts. Additionally, the nuclear-related commands of the U.S. military, particularly those of the U.S. Air Force, continue to face significant personnel problems that are signs of a general malaise within U.S. nuclear forces and invariably raise questions about the operational viability of the U.S. nuclear deterrent. In addition to the 2007 nuclear security incident detailed earlier in this chapter, in more recent years the nuclear components of the U.S. military have seen personnel incidents involving misconduct by senior military commanders, leadership failures by a number of military officers, operational fitness problems among U.S. Air Force missile officers, cheating scandals involving U.S. Air Force missile officers and U.S. Navy nuclear officers, drug use among personnel charged with guarding nuclear weapons, and morale issues related to poor career prospects and a dilapidated support infrastructure at U.S. nuclear bases (Woolf, 2016, March 10; Woolf, 2016, March 23; Wolfsthal, Lewis & Quint, 2014; Broad & Sanger, 2014, September 21; Broad & Sanger, 2014, November 13; Broad & Sanger, 2016, January 11; Broad & Sanger, 2016, April 16; Philipps, 2015, December 5; Cooper, 2014, July 9; Fisher, 2013, December 19; Gordon, 2013, May 8; Lamothe, 2016, March 18).

Current U.S. Efforts on Nonnuclear Military Technologies that Affect Strategic Stability

Per the 2010 NPR, the U.S. is committed to continuing development of ballistic missile defenses and advanced, long-range conventional weapons, which have potential implications for strategic stability and nuclear deterrence relationships. The U.S. currently has sea-based theater missile defenses available to protect Europe from Iranian missile attacks, both land-based and sea-based theater missile defense systems in Asia to protect allies from North Korean attacks, and limited national missile defenses based in California and Alaska that are oriented against North Korea (U.S. Department of Defense, 2010, p. 20, 25; Koblentz, 2014, p. 21-22; Roberts, 2016, p. 86-87). From a general perspective, the main issue with a nuclear state developing ballistic missile defenses is that they can spur an increase in nuclear arsenals, since other nuclear states may feel compelled to increase their numbers of deployed nuclear weapons and ballistic missiles in order to overcome any missile defenses and preserve their nuclear deterrent (Waltz, 2013, p. 103-107; Koblentz, 2014, p. 21-22). Nuclear states can also employ technical countermeasures such as decoy warheads to stymie ballistic missile defenses and utilize alternative delivery vehicles such as cruise missiles for nuclear attacks (Waltz, 2013, p. 104; Koblentz, 2014, p. 22). Roberts (2016) stresses the limited nature of current U.S. national missile defense capabilities:

the existing homeland defense posture is [only] effective against small numbers of early generation intercontinental-range ballistic missiles... The shortcomings of current U.S. BMD [ballistic missiles defense] systems and existing technologies in dealing with counter-measures and large raid sizes are well known... missile defenses can be deployed and effective against early generation threats from countries like North Korea but cannot be effective against the large and mature forces of Russia and China. (p. 87)

Despite repeated U.S. assurances over the limited nature and orientation of its missile defenses, Russia and China continue to voice concerns over U.S. missile defenses efforts, particularly the future potential of such defenses (Koblentz, 2014, p. 22; O’Hanlon, 2010, p. 135-136). China and Russia also view U.S. efforts to develop an advanced conventional strike capability as a potential threat to their nuclear deterrents (Koblentz, 2014, p. 25). Some advanced conventional strike systems could increase the danger of inadvertent escalation since other nuclear states might have difficulties differentiating the employment of advanced conventional systems with nuclear delivery systems (Koblentz, 2014, p. 24-25). However, Roberts (2016) emphasizes that U.S. efforts involving advanced, long-range conventional weapons remain in the research and development phase, with no timeframe or program in place to produce these weapons (p. 85).

Assessment of Obama Administration efforts regarding Nuclear Weapons

The Obama administration can be credited with moving the U.S. closer to a balanced nuclear weapons policy that better supports U.S. nonproliferation efforts and long-term disarmament goals while still maintaining an effective nuclear deterrent. Like other post-Cold War administrations, the Obama administration has worked to reduce the number of U.S. nuclear weapons, mostly notably by reaching the New START agreement with Russia and publicly expressing interest in further bilateral nuclear arms reductions. However, unlike its predecessors, the Obama administration also has reduced the role of nuclear weapons in U.S. national security strategy with the 2010 NPR’s modified “negative security assurance.” By instituting these changes to U.S. nuclear weapons policy in a transparent manner involving regular consultations with allies and other actors, the Obama administration has reduced the possibility that U.S. allies might consider acquiring their own nuclear weapons and has left open

the possibility of future strategic cooperation with other nuclear states. Despite criticism from a number of nonproliferation and disarmament advocates, the Obama administration has moved forward with plans to comprehensively modernize U.S. nuclear forces in order to ensure the U.S. maintains a capable and survivable nuclear deterrent for the foreseeable future (Roberts, 2016).

However, despite this progress under the Obama administration, the U.S. can move even further towards a balanced nuclear weapons policy. Specific policy recommendations will be discussed at the end of this chapter, but in general the U.S. can consider further modifying its nuclear posture in order to continue to reduce the role of nuclear weapons, and can implement further nuclear reductions, even if that entails moving beyond the traditional bilateral nuclear arms reduction process with Russia. In considering any additional changes to its nuclear weapons policy, the U.S. first needs to examine its threat environment for both contemporary and future security challenges that might require nuclear weapons.

The Contemporary Nuclear Environment Facing the U.S.

As discussed in chapter four of this study, a state's perceived threat environment, as well as its available capabilities or options to counter such threats and ensure its security, are crucial variables in the selection of a nuclear posture and the overall feasibility of a balanced nuclear weapons policy. This section will briefly discuss the international nuclear environment facing the U.S., beginning with the general challenge of asymmetric nuclear escalation the U.S. faces in potential confrontations with a number of states, especially small nuclear states such as North Korea. Next, this section discusses Russia and China, two large, nuclear-armed states that undoubtedly consider and plan for the possibility of armed conflict with the U.S. that could include the use of nuclear weapons (Koblentz, 2014, p. 4). The U.S., Russia, and China are one

example of a “security trilemma” where contemporary nuclear states face a dynamic and interconnected set of deterrence relationships: “The overlapping bilateral deterrence relationships among nuclear states creates the potential for changes in the capabilities or intentions of one state to have a cascading effect on the rest of the nuclear weapons states” (Koblentz, 2014, p. 20-21). In addition, Hansell and Perfiljev (2009) note that the U.S., Russia, and China will be leading powers to determine the future trajectory of nuclear arms control and the possibility of nuclear disarmament (p. 435). Lastly, this section will discuss the current views of U.S. allies in both Europe and Asia regarding nuclear weapons and extended deterrence.

The Challenge of Asymmetric Nuclear Escalation Facing the U.S.

Lieber and Press, as well as the recent volume *On Limited Nuclear War In the 21st Century* edited by Jeffrey Larsen and Kerry Kartchner, examine the dangers of asymmetric nuclear escalation, focusing on the challenges the U.S. faces in scenarios involving conventional wars between the U.S. and other nuclear states where the other state may logically choose to introduce nuclear weapons (Lieber & Press, 2013, p. 5-12; Lieber & Press, 2013, January; Lieber & Press, 2009, p. 39-41; Larsen & Kartchner, 2014). Lieber and Press note that a prevalent view among U.S. officials assumes that U.S. nuclear capabilities will deter any adversary from using nuclear weapons, even during a conventional conflict with the U.S. (Lieber & Press, 2013, p. 6, 10-11; Lieber & Press, 2013, January, p. 5-6, 10, 38-39, 46). However, while the U.S. may view such conflicts as limited, other nuclear states, especially small nuclear states such as North Korea and possible future nuclear states such as Iran, would likely view a war against the U.S. as a mortal challenge to their sovereignty (Lieber & Press, 2013, p. 6; Lieber & Press, 2013, January, p. 11-13, 37-38; Lieber & Press, 2009, p. 42-43; Larsen, 2014, p. 4; Mahnken, 2014, p. 130).

Given U.S. conventional military superiority and the U.S. style of warfare that entails the overwhelming use of force targeting enemy leadership as well as command and control systems, adversaries armed with nuclear weapons will have compelling motivations to escalate in order to have any hope of preventing defeat (Lieber & Press, 2013, p. 6, 10-12; Lieber & Press, 2013, January, p. 2-3, 6-13, 23-24, 33-36, 46; Lieber & Press, 2006, p. 32; Lieber & Press, 2009, p. 41-43; Larsen, 2014, p. 4, 18). States such as Pakistan and Russia have overt asymmetric nuclear escalation strategies in order to deter more powerful conventional military threats and such strategies are similar to the Cold War-era NATO strategy that threatened to use theater nuclear weapons in order to deter a Soviet conventional military invasion of Western Europe: “Those who were weak during the Cold War are now strong, and another set of militarily “weak” countries – such as North Korea, Iran, Pakistan, and even China and Russia – now clutch or seek nuclear weapons to defend themselves from overwhelming military might, just as NATO once did” (Lieber & Press, 2013, p. 6-7, 10-12; Lieber & Press, 2013, January, p. 2, 6-11, 18, 27-29, 39, 42, 46; Lieber & Press, 2009, p. 42; Bernstein, 2014, p. 106-110). Even a state with a NFU nuclear weapons policy such as China could face circumstances during a war with the U.S. where asymmetric nuclear escalation might become a compelling option (Bernstein, 2014, p. 111-117; Lieber & Press, 2013, January, p. 28).

The optimal choice for the U.S. would be not fighting other nuclear states; however, given U.S. security interests and commitments around the globe, future wars with other nuclear states remain possible (Lieber & Press, 2013, p. 7; Lieber & Press, 2013, January, p. 7). Roberts (2016) emphasizes that U.S. ballistic missile defense efforts can play an important role in thwarting efforts by small states such as North Korea that attempt to use their nuclear weapons in peacetime as tools of extortion and brinkmanship; in an actual limited nuclear conflict, missile

defenses would be helpful in reducing the effectiveness of a small state's nuclear attack and limiting damage (p. 74, 83, 86-92, 97-98, 101). In order to keep wars with other nuclear states limited, the U.S. may need to re-examine and modify its existing war plans, ensuring that both the stated objectives of any military campaign and the operational methods employed to meet those campaign objectives would be clearly seen as limited from the adversary's perspective (Lieber & Press, 2013, p. 7, 12; Lieber & Press, 2013, January, p. 4, 42-44). In the event that an adversary still decided to introduce nuclear weapons during a conventional war, Lieber and Press recommend that the U.S. should ensure it has viable and versatile military capabilities, including nuclear forces, to be able to respond with counterforce strikes to destroy an adversary's remaining nuclear forces (Lieber & Press, 2013, p. 7-10, 12; Lieber & Press, 2013, January, p. 4, 42, 44-45; Lieber & Press, 2009, p. 40-41, 44-49). Bennett (2014) emphasizes the U.S. must have well-developed and versatile nuclear attack plans in order to respond effectively to adversary asymmetric escalation and recommends several adjustments to U.S. nuclear forces, including changes to ICBM and SLBM launch areas that would reduce the danger of inadvertent escalation, where an uninvolved nuclear state such as Russia might mistakenly interpret a U.S. missile launch as an attack on itself (p. 231, 238-241).

Russia

Overall, the significant downturn in U.S.-Russia relations in recent years means that any significant progress on bilateral nuclear issues is very unlikely in the near term while President Putin remains in power (Roberts, 2016, p. 106-107, 139-140). Even in the years after the end of the Cold War when relations with NATO and the U.S. were more positive, Russia viewed issues such as NATO expansion with wariness and Russian military planning continued to view the

U.S. and NATO as a central adversary (Roberts, 2016, p. 107-114, 127). Roberts (2016) states “leaders in Moscow feel not only threatened by the United States and NATO but encircled and humiliated” (p. 106). Russia’s adversarial views of the U.S. and NATO have only hardened in recent years under President Putin’s leadership; in a speech defending Russia’s annexation of Crimea in 2014, Putin stated “In short, we have every reason to assume that the infamous policy of containment, led in the 18th, 19th, and 20th centuries, continues today. They are constantly trying to sweep us into a corner... If you compress the spring all the way to its limit, it will snap back hard.” (as cited in Roberts, 2016, p. 114-115). To support Russia’s foreign policy aimed at increasing Russian influence globally and opposing the U.S., the Russian military is undergoing a significant conventional and nuclear modernization; these efforts appear to be focused primarily on qualitative improvements to military forces and do not entail an expansion of nuclear forces (Roberts, 2016, p. 136-137; Sokov, 2013, p. 255-256; Koblenz, 2014, p. 8). Nuclear weapons continue to play a central role in Russian national security strategy, in part to offset Russian conventional military weaknesses that were evident in the years after the end of the Cold War (Roberts, 2016, p. 106, 130; Hansell & Perfiljev, 2009, p. 436). Russian nuclear forces have a traditional strategic deterrence mission as well a limited nuclear war mission that Russia ironically calls “de-escalation” – “a threat of a limited nuclear strike in response to a large-scale conventional attack that exceeded the capability of Russian conventional forces... The de-escalation strategy is exclusively oriented toward deterring the United States and its NATO allies...” (Sokov, 2013, p. 250-252; Bernstein, 2014, p. 109). Russian NSNWs feature prominently in this “de-escalation” strategy, with Russia maintaining thousands of NSNWs and ongoing efforts reportedly to develop new NSNWs that are more accurate and have lower explosive yields (Bernstein, 2014, p. 110; Roberts, 2016, p. 130-131, 133-134).

Even before the recent deterioration in U.S.-Russia relations, Russia has resisted calls for additional bilateral nuclear arms negotiations for at least three reasons. Russia's biggest concerns involve U.S. efforts to develop ballistic missile defenses and advanced, long-range conventional weapons. While the U.S. has repeatedly sought to alleviate Russian concerns, Russia continues to view U.S. missile defenses and advanced conventional weapons as potential threats to its nuclear deterrent and insists these non-nuclear capabilities must be addressed in any future nuclear arms reduction process. In addition, Russian officials have taken the position that U.S. and Russian nuclear force reductions have gone as low as possible in a bilateral context, and that future nuclear arms negotiations must be multilateral (Koblentz, 2014, p. 21-22; 24-25; Roberts, 2016, p. 119, 122-123; Zenko, 2010, p. 14, 17-19; Hansell & Perfilyev, 2009, p. 436-440, 447, 455; Sokov, 2013, p. 248-250, 258).

China

U.S.-China relations, including the nuclear dimension, remain relatively stable, but political tensions are growing as China is a rising state that seeks to increase its influence within the international system and challenge the U.S.-dominated political order in Asia (Roberts, 2016, p. 141-145, 170). Roberts (2016) describes how "Many officials, military leaders, and experts in Beijing believe that the United States is a hegemonic power committed to the containment of China and even to the overthrow of its current system of government" (p. 145). With U.S. forces and alliances in Asia, armed conflict between China and the U.S. remains possible given the ongoing maritime territorial disputes in the East and South China Seas, as well as the long-standing issue of Taiwan's status. With regards to nuclear weapons, China has maintained a historically small nuclear arsenal that currently consists of approximately 250 warheads, as well

as an official NFU nuclear posture. However, as part of its long-term military modernization, China is increasing the size of its nuclear forces and improving the effectiveness of its deterrent, with the aim of establishing a secure, second strike capability with delivery vehicles such as SLBMs and mobile ICBMs. In addition, China continues to be relatively opaque about its nuclear capabilities, a strategy that it sees as enhancing deterrence; however, this lack of transparency has impeded nuclear dialogue between the U.S. and China, and would be a significant issue in any future nuclear arms agreements. Due to its modest nuclear arsenal, China is even more concerned than Russia that U.S. ballistic missile defenses and advanced conventional weapons could be a serious threat to China's strategic deterrent, despite U.S. efforts to allay these concerns. Some Chinese observers have commented that China's nuclear force improvements are necessary efforts to counter U.S. ballistic missile defenses and advanced conventional weapons. China shares Russia's position that the issues of ballistic missile defense and advanced conventional weapons must be addressed in any future nuclear arms reductions forum. However, China also argues that the U.S. and Russia should reduce their arsenals much further before China considers joining any future multilateral nuclear arms reduction efforts (Roberts, 2016, p. 145-163, 167; Koblentz, 2014, p. 14-15, 21-22, 24-25; Hansell & Perfileyev, 2009, p. 436-441, 446-447, 453, 455; Twomey, 2013, p. 289-291, 293-299; Bernstein, 2014, p. 111, 114). Roberts (2016) notes, though, that historically China's "goalposts seem to keep moving" regarding how low the U.S. and Russia need to cut their arsenals before China engages in a multilateral nuclear negotiation process (p. 151-152). China also regularly highlights its long-standing NFU doctrine and criticizes the reluctance of other nuclear states such as the U.S. to adopt a similar posture. However, China's NFU doctrine may still allow for the initial use of nuclear weapons to respond in scenarios where an adversary's conventional military attacks have

targeted China's nuclear forces or other high-value national assets. The possibility of inadvertent nuclear escalation is exacerbated by China's co-location of conventional and nuclear ballistic missile units (Twomey, 2013, p. 293; Roberts, 2016, p. 150, 152, 156, 168-170; Bernstein, 2014, p. 113-116).

U.S. Allies in Europe and Asia

The nuclear component of U.S. extended deterrence guarantees remains critical to the security interests of U.S. allies in Europe and Asia. Roberts (2016) explains how extended deterrence involves both deterrence and assurance, with "two different audiences: the adversary state posing the threat and the allied state under threat. Extended deterrence is intended to prevent aggression and coercion by adversaries and to assure allies that their vital interests will not be jeopardized" (p. 177-180). As noted earlier in this chapter, the nuclear dimension of U.S. extended deterrence also supports U.S. nonproliferation objectives by significantly reducing the need for U.S. allies to consider acquiring their own nuclear weapons (Gavin, 2015, 30-31; O'Hanlon, 2010, p. 72-78; Roberts, 2016, p. 220; Sagan, 2009, p. 167). While the current number of U.S. nuclear weapons in Europe is a small fraction of the force deployed during the Cold War, nuclear weapons continue to have an important and enduring role in NATO's security strategy, a reality that has only been reinforced by an increasingly hostile Russia (Roberts, 2016, p. 176, 181-182, 196). NATO's nuclear weapons are meant to deter primarily Russia and the integrated nature of the Alliance's nuclear structure serves "as a testament to the transatlantic link at the core of the alliance" (Roberts, 2016, p. 176, 180-181, 187-191, 194-196). U.S. NSNWs are deployed in select NATO countries under sharing agreements where these allies, along with U.S. forces, could jointly utilize these nuclear weapons during a conflict (Roberts,

2016, p. 180-181). It should be noted that NATO's views of nuclear weapons are not monolithic; some NATO members downplay the need for the Alliance's integrated nuclear structure, while other NATO states continue to support the U.S. forward deployment of NSNWs in Europe (Roberts, 2016, p. 182, 187-188). The language within NATO's 2010 Strategic Concept, which serves as a baseline guide to NATO's security strategy, reflects this balance of views of nuclear weapons: "Deterrence, based on an appropriate mix of nuclear and conventional capabilities, remains a core element of our overall strategy. The circumstances in which any use of nuclear weapons might have to be contemplated are extremely remote. As long as nuclear weapons exist, NATO will remain a nuclear alliance" (as cited in Roberts, 2016, p. 183). Given the poor state of relations with Russia, coupled with Russia's ongoing military modernization and wartime strategies that involve limited nuclear strike options, NATO will regularly have to assess its nuclear posture, with potential adjustments in the future in order to maintain strategic deterrence (Roberts, 2016, p. 194-196). The U.S. has emphasized that any decisions regarding NATO's nuclear strategy, including the U.S. nuclear footprint in Europe, must involve significant consultations with all NATO member states (Roberts, 2016, p. 183).

In contrast with Europe, U.S. nuclear weapons are currently not forward deployed with its allies in Asia. While their security perceptions are not exactly the same, Japan and South Korea continue to support the nuclear component of U.S. extended deterrence and both states have security concerns regarding North Korea and China. Extended nuclear deterrence for Japan and South Korea hinge on U.S. declaratory nuclear posture and the ability to reintroduce U.S. NSNWs to Northeast Asia if security conditions warranted such an adjustment in nuclear posture. As noted earlier in this chapter, the U.S. decision in the 2010 NPR not to shift U.S. declaratory nuclear doctrine to an unconditional NFU stance was based in part by the view that

U.S. nuclear weapons may continue to have deterrence utility relevant to North Korean nonnuclear attack scenarios, as well as a reassurance function for South Korea and Japan. The exercise of U.S. nuclear capabilities has served as a messaging tool of deterrence and reassurance by visibly reinforcing the U.S. security commitment to Japan and South Korea; while U.S. NSNWs have not been reintroduced to Northeast Asia, U.S. strategic bomber flights have fulfilled this messaging function in recent years during periods of regional tensions. U.S. consultations with Japan and South Korea remain crucial to addressing substantive issues of extended nuclear deterrence and regularly reassuring these allies of the U.S. security commitment; in the wake of the extensive consultations that took place during the 2010 NPR process, the U.S. and its allies created two bilateral consultative forums to regularly discuss extended nuclear deterrence issues (Roberts, 2016, p. 32, 197-199, 201-203, 206-207, 209, 212-213; Huntley, 2013, p. 307-309, 311-312, 316, 319-320; 324-325, 329; Bernstein, 2014, p. 91).

Policy Recommendations

In applying the principles of nuclear balance theory to the U.S. case, this section will briefly describe the next steps the U.S. can take towards a more balanced nuclear weapons policy that takes into account deterrence requirements, nonproliferation objectives, and long-term disarmament goals. The policy recommendations below involve changes to U.S. nuclear posture, force structure, and U.S. efforts regarding the development of select nonnuclear capabilities that can directly affect nuclear deterrence and strategic stability.

U.S. Adoption of a NFU Nuclear Posture

The U.S. can adopt a NFU nuclear posture that strengthens its nonproliferation policies and disarmament goals, while still maintaining essential deterrence requirements to protect the U.S. and its allies. A U.S. NFU nuclear posture would state that the U.S. nuclear arsenal exists to deter nuclear attack on the territories and military forces of the U.S. and its allies, and therefore the U.S. will not use or threaten to use nuclear weapons against nonnuclear states (Sagan, 2009, p. 164). Such a NFU doctrine would preserve an assured retaliation function for U.S. nuclear forces to respond to nuclear attack (Daalder and Lodal, 2008). Sagan (2009) describes how U.S. declaratory nuclear doctrine has multiple functions such as influencing public debates and U.S. military planning, as well as communicating deterrence threats to adversaries and reassurance messages to allies; in addition, “statements about doctrine can influence both the likelihood and consequences of nuclear proliferation by helping shape global norms about reasonable and legitimate potential use of nuclear weapons. These norms can in turn influence internal debates in new and potential nuclear-weapons states about their own nuclear doctrine or potential nuclear-weapons acquisition” (p. 165-166). The U.S. adoption of a clear NFU posture would definitively reduce the role of nuclear weapons in U.S. national security strategy; given the U.S.’s role as a leading world power, such a change to a more moderate nuclear weapons policy could positively influence other states’ nuclear decisions and behavior, which is consistent with U.S. nonproliferation objectives. Since the U.S. adoption of a NFU posture would reduce the role and utility of nuclear weapons, such a shift would make U.S. nuclear weapons policy more consistent with the nonproliferation regime, the international norm against the use of nuclear weapons, and long-term disarmament goals, all of which aim to reduce the importance of nuclear weapons in international politics. By reducing the salience of nuclear

weapons, a NFU posture would strengthen the arguments of U.S. policymakers and diplomats that the U.S. is serious about pursuing nuclear disarmament, which could help garner international support for nonproliferation efforts. A NFU doctrine would help to reduce the contradiction between U.S. nonproliferation efforts, which aim to discourage states from acquiring nuclear weapons by emphasizing the illegitimacy, limitations, and downsides of these weapons, and current U.S. nuclear weapons policy, which technically still allows for the potential U.S. use of nuclear weapons to respond to some nonnuclear attacks (Sagan, 2009, p. 169, 172-175; Daalder & Lodal, 2008). Many nonnuclear states would likely react positively to a U.S. NFU posture. A U.S. move to NFU is not likely to affect Russia under Putin, but a U.S. NFU stance could positively influence Russia over the long term, especially if Russia's conventional military capabilities continue to improve, which could reduce the perceived need by Russia to rely heavily on its nuclear arsenal to deter nonnuclear attacks. Given China's record of criticizing other nuclear states, including the U.S., for not adopting a NFU posture, a U.S. move to NFU would remove this issue as a potential source of Chinese diplomatic leverage (Fingar, 2011, p. 60; Twomey, 2013, p. 293). In terms of other benefits, a U.S. NFU doctrine would also provide clear guidance to U.S. military leaders that preventive or preemptive attacks with nuclear weapons are not viable options (Sagan, 2009, p. 166-167).

To its credit, the Obama administration in the 2010 NPR moved U.S. declaratory nuclear doctrine fairly close to a NFU posture with the modified "negative security assurance" and expressed a U.S. desire to eventually establish a NFU stance (Sagan & Vaynman, 2011, p. 20-21, 23-24). When considering the current set of states that are excluded from the modified "negative security assurance" along with realistic scenarios in terms of potential U.S. adversaries, one is left with the cases of Russia, China, and North Korea. While a detailed analysis of Russian,

Chinese, and North Korean conventional, chemical, and biological weapons capabilities is beyond the scope of this study, it is hard to envision nonnuclear attacks by these states actually warranting a U.S. nuclear retaliatory response. The U.S. continues to enjoy conventional military superiority over every other state within the international system and thus does not require nuclear weapons to deter or respond to conventional attacks. The U.S.'s conventional military superiority also means that the U.S. can rely on the threat of severe conventional military retaliation to deter chemical or biological attacks. Chemical weapons attacks are not likely to inflict the number of casualties that would justify nuclear retaliation. While potentially much deadlier than chemical weapons, biological weapons with today's technology also are not likely to kill the number of people that would necessitate a nuclear response. It is always possible that a future nonnuclear threat, perhaps in the form of a hostile, expansionist state with an overwhelming conventional military or advanced biological weapons capable of killing enormous numbers of people, might materialize that could justify the U.S. use of nuclear weapons for deterrence and retaliatory purposes. However, if such dire threats did appear, the U.S. always has the option to change its declaratory nuclear doctrine to meet new security needs. It is worthwhile to note that the U.S. use of nuclear weapons to respond to nonnuclear attacks likely would involve significant international political costs, which could include spurring additional nuclear proliferation and imperiling the norm against the use of nuclear weapons (Sagan, 2000, p. 105, 110-115; Sagan, 2009, p. 167, 171, 177-178; O'Hanlon, 2010, p. 55-71, 116-117; Daalder & Lodal, 2008; Ferguson, 2009, p. 17-18). In short, as a powerful state with unmatched conventional military capabilities, the U.S. currently does not require nuclear weapons to deter conventional, chemical or biological attacks, and likely would not want to utilize nuclear weapons to respond to such nonnuclear attacks.

As noted in chapter three, there may even be circumstances where U.S. nuclear retaliation would not be worthwhile to respond to limited nuclear attacks by small states. States such as North Korea may not offer much in the way of viable targets for a nuclear retaliatory strike, especially if all of their nuclear weapons were utilized in an initial attack. Nuclear strikes could be conducted against a small state's conventional military forces, but the U.S. would not necessarily need to use nuclear weapons to destroy these kinds of targets. If the U.S. decided to employ nuclear weapons, it would face the issue of geographic "co-location" where many possible targets within a small nuclear state are relatively close to cities; nuclear strikes could very well produce significant radioactive fallout, resulting in many civilian casualties in the targeted state as well as nearby non-involved states. With a state such as North Korea that is governed by a brutal autocracy, there is a moral quandary for U.S. nuclear retaliation given that nuclear retaliatory strikes would lead to significant suffering for a civilian population that was not involved in their state's strategic choices. To deal with some scenarios involving a small state's nuclear attacks, the U.S. may be better served using conventional military retaliation, including options that threatened regime change and full-fledged conventional war (Nichols, 2014, p. 127-169).

Any change in U.S. declaratory nuclear doctrine, including a move to NFU, would require extensive consultations with U.S. allies in Europe and Asia. It is possible that some allies could worry that a U.S. move to NFU would be a negative indicator as to the strength of U.S. security commitments (Sagan, 2009, p. 167-169). However, as Sagan (2009) notes, extended nuclear deterrence can co-exist with a NFU posture by utilizing a "more tailored guarantee to use nuclear weapons in retaliation against a nuclear attack, but only a nuclear attack, on U.S. allies" (p. 167-169). U.S. conventional military superiority allows the U.S. to reassure

its allies that an adversary's nonnuclear attacks would be met with massive U.S. conventional military force (Sagan, 2009, p. 167-169).

Unilateral U.S. Nuclear Reductions, Modernization and Revitalization

The U.S. can reduce the size of its nuclear arsenal significantly in order to further bolster U.S. nonproliferation efforts and demonstrate leadership in the long road towards global nuclear disarmament, while at the same time modernizing and revitalizing such a smaller force to ensure it remains an effective deterrent. A new bilateral treaty with Russia to reduce deployed strategic nuclear warheads to 1,000 weapons for each side would be an ideal next step, but is highly unlikely for the foreseeable future given the poor state of U.S.-Russia relations. However, there is no compelling need for the U.S. to remain shackled to the traditional process of bilateral nuclear arms reductions with Russia, especially given the currently uncooperative nature of the Putin regime. Given the absolute deterrent power of nuclear weapons, the U.S. can consider unilateral reductions of its nuclear arsenal and still maintain an effective deterrent against Russia or any other conceivable adversary. As noted earlier in this study, there is no exact formula to determine how many nuclear weapons the U.S. or any other nuclear state actually requires for deterrence purposes. The guiding principle from nuclear balance theory is that a nuclear state simply does not need an overabundance of nuclear weapons to deter, and certainly does not require numerical equivalence vis-à-vis an adversary. A number of studies within the academic and policy communities have proposed various numbers for future U.S. reductions. In terms of U.S. NSNWs, given the important role these weapons have for extended nuclear deterrence in Europe and Asia, as well as the fact that the U.S. NSNWs inventory is already relatively small, the U.S. should not reduce its NSNW arsenal and should maintain the small number of NSNWs

currently deployed in Europe. However, in terms of strategic nuclear weapons, an option the U.S. might consider would be a 50% cut from New START levels, which would reduce U.S. forces to 775 deployed strategic warheads. Such a reduction in U.S. nuclear force levels would bolster U.S. nonproliferation efforts by allowing the U.S. to credibly argue it is making a full faith effort to reduce the importance of nuclear weapons in U.S. security strategy and is working to meet its Article VI obligations under the NPT to eventually disarm. Over the long term, U.S. unilateral nuclear reductions could also end up being a helpful first step in breaking the impasse over nuclear reductions that currently exists between the U.S., Russia, and China. Specifically, if in the future U.S.-Russia relations were to improve, Russia might be inclined to eventually match U.S. reductions given Russia's historical preference for a bilateral nuclear relationship with the U.S. In addition, a reduced U.S. arsenal consisting of hundreds of deployed strategic nuclear weapons, rather than thousands, could serve as an informal marker to limit China's nuclear expansion given China's insistence that it only needs a modest nuclear capability. Admittedly, such a future scenario is speculative, but U.S. leadership through unilateral reductions could provide a pathway to begin a multilateral nuclear arms reductions process (Daalder & Lodal, 2008; Nichols, 2014, p. 84-85, 91-93, 114-117; Zenko, 2010, p. 5-6; O'Hanlon, 2010, p. 111-113; Waltz, 2013, p. 17-32, 98-100, 108, 110-111; Goldstein, 2000, p. 283, 289-290; Podvig, 2011, p. 42, 48-49; Twomey, 2013, p. 299).

In making these unilateral nuclear reductions, the U.S. will want to ensure that its deterrent remains effective in providing a second strike capability, which will probably require significant investments to modernize and revitalize U.S. nuclear forces. To maintain its second strike capability, the U.S. will want to employ the most survivable delivery platforms. Currently, U.S. SSBNs armed with SLBMs remain the most survivable delivery platform and should

continue to carry the highest proportion of strategic nuclear warheads. However, a small number of ICBMs should still be maintained as a hedge to guard against any military developments that could make SSBNs vulnerable. In addition, strategic nuclear bombers should be maintained given their flexibility and function as a tool for conveying messages of deterrence and reassurance. To meet the 775 warhead limit, the U.S. could maintain 600 nuclear warheads on SLBMs, 100 warheads on ICBMs, and 75 nuclear bombs or cruise missiles for strategic bombers. As noted earlier in this chapter, the U.S. nuclear arsenal is aging and in the coming decades all three legs of the U.S. nuclear triad will require upgrades and eventual replacements. Despite the significant financial costs, as well as the likely international criticism, U.S. nuclear modernization efforts are worthwhile and necessary in order to maintain an effective nuclear deterrent force. In addition, the U.S. cannot afford to ignore the reality that other nuclear states such as China, Russia, and others are actively modernizing their nuclear forces in order to maintain their deterrents for the foreseeable future. The tentative U.S. plans to acquire new strategic bombers, air-launched cruise missiles, ICBMs, and SSBNs are reasonable efforts to ensure the U.S. nuclear arsenal remains a modern and effective force. To increase the survivability of its ICBMs, the U.S. might even want to re-examine the possibility of developing mobile ICBMs in the future; while the development of U.S. mobile ICBMs would likely be costly and could be politically controversial, it is notable that other nuclear states such as Russia and China are actively developing and fielding mobile ICBMs. If military developments led to U.S. SSBNs becoming relatively vulnerable, the option to field U.S. mobile ICBMs could become compelling. To maximize options to respond to nuclear attacks from potential adversaries such as North Korea, the U.S. may need to change the basing locations for some of its ICBMs, as well as SLBM launch areas, in order to reduce the danger of inadvertent

escalation, where an uninvolved nuclear state such as Russia might mistakenly interpret a U.S. missile launch as an attack on itself (Zenko, 2010, p. 7, 23; Daalder & Lodal, 2008; Waltz, 2013, p. 19-21, 110-111; Koblenz, 2014, p. 8-18; Bennett, 2014, p. 231, 238-241; O'Hanlon, 2010, p. 114; Nichols, 2014, 117-119).

In general, a smaller U.S. nuclear arsenal should be easier to manage and secure, which should translate into a reduced risk of nuclear accidents, inadvertent escalation, unauthorized use, or theft of nuclear weapons by terrorists or other actors. However, the recent history of personnel incidents involving U.S. nuclear forces is concerning and could increase many of these same dangers. Defense Department studies have noted that there is a need for sustained efforts to re-professionalize and re-vitalize U.S. nuclear weapons personnel. The U.S. Air Force should work to create viable and rewarding career paths for its nuclear weapons personnel. It could be useful for the Defense Department to examine other components of the U.S. military, such as the Special Operations Forces community, in order to re-instill the elite and awesome responsibility that is inherent to the U.S. nuclear deterrence mission (Glaser, 1998, p. 113, 117-118; Waltz, 2013, p. 20-21; Nichols, 2014, p. 85; Goldstein, 2000, p. 278, 296-297; Sagan, 2013, p. 71, 123-124, 150-153; Broad & Sanger, 2014, November 13).

Restrictions on U.S. Nonnuclear Capabilities that Could Affect Strategic Stability

Overall, the U.S. should place sufficient restrictions on nonnuclear capabilities such as ballistic missile defenses and advanced conventional weapons in order to preserve strategic stability. The U.S. should make every effort to avoid building missile defenses that might endanger Russian or Chinese nuclear capabilities, potentially causing these states to significantly expand their arsenals. Through dialogue and transparency, the U.S. should persist in making

every reasonable attempt to reassure Russia and China that U.S. missile defense efforts are not aimed at undermining strategic stability. At the same time, the U.S. should concentrate its efforts to build theater ballistic missile defenses and limited national missile defenses oriented against states such as North Korea in order to counter its efforts at nuclear extortion and to limit damage in a potential conflict. With regards to advanced conventional weapons, research and development of these capabilities by a number of states is likely inevitable. However, at the very minimum, the U.S. should not deploy ICBMs or SLBMs with conventional warheads in order to avoid the risk of inadvertent nuclear escalation and out of concerns that such weapons could make preemptive attacks on nuclear deterrent forces a viable option (Koblentz, 2014, p. 33-36, Roberts, 2016, p. 74, 83, 86-92, 97-98, 101; Zenko, 2010, p. 17-18).

Chapter 6: CONCLUSION

As the most powerful state in the international system, the U.S. has a unique opportunity to positively influence the world's future nuclear environment. Due to its current conventional military superiority, the U.S. does not require nuclear weapons to deter or respond to nonnuclear attacks on itself or its allies and can safely declare a clear NFU posture; by reducing the role of nuclear weapons in U.S. national security strategy, a NFU doctrine is more consistent with the nonproliferation regime and long-term disarmament goals. Given the absolute deterrent power of nuclear weapons, the U.S. can safely reduce its nuclear arsenal significantly, which would demonstrate a clear commitment to lead the process to eventual global nuclear disarmament. A more modest nuclear weapons policy that includes a NFU posture and a sizeable unilateral reduction of its nuclear arsenal would only bolster U.S. nonproliferation policy by increasing U.S. diplomatic credibility in efforts to curb the nuclear ambitions of states such as Iran and North Korea, as well as positively influencing nonnuclear states to remain nonnuclear and nuclear states to moderate their nuclear weapons programs. U.S. restraint on missile defenses and advanced conventional weapons can help to avoid a large-scale nuclear or conventional arms race with Russia or China. While developing U.S. missile defenses and potential advanced conventional weapons options to counter threats from states such as North Korea is understandable and has merit, the U.S. should not overly pursue such initiatives to a degree that they end up encouraging a large-scale Russian or Chinese nuclear expansion that invariably increases the threat to U.S. national security. Obviously, a major Russian or Chinese nuclear weapons buildup would be a set back to long-term efforts to pursue global nuclear disarmament and could hurt the nonproliferation regime.

However, the U.S. by itself cannot bring about global nuclear disarmament. The international security environment is currently not conducive to moving towards nuclear disarmament. Due to their perceived threat environments, nearly every other nuclear state plans to maintain their nuclear weapons capability, with several modernizing and growing their arsenals. Given the long timeframe and uncertain prospects of global nuclear disarmament, the U.S. will need a capable nuclear deterrent for the foreseeable future. Due to the constantly evolving nature of military technologies, the U.S. will need to regularly modernize its nuclear forces to ensure a safe, effective, and survivable strategic deterrent. In terms of force structure, there is no one answer to the question – How many nuclear weapons are enough? Force size and structure will remain a subject of debate both within and outside of the U.S. government. However, the force structure changes recommended in this study, which would involve a 50% reduction from New START levels resulting in a force consisting of 775 strategic nuclear warheads deployed on SLBMs, ICBMs, and strategic bombers, would serve dual purposes; such changes would be both a tangible nuclear reduction to demonstrate U.S. commitment to disarmament and nonproliferation, while still maintaining a powerful, survivable, and flexible deterrent that can respond to any adversary with a variety of nuclear employment options, from the use of a single nuclear weapon to hundreds of nuclear strikes. With the need to comprehensively modernize its nuclear forces, the U.S. government will be making critical decisions on the future of U.S. nuclear weapons policy in the coming decades; it is imperative for the U.S. national security establishment, academic community, and American people to re-engage on nuclear issues given the enduring challenges and dangers of nuclear weapons.

One could argue the U.S. has the responsibility to lead disarmament efforts, given its history as the world's first nuclear-armed state and the only state to have employed nuclear

weapons in time of war, as well as its current status as the most powerful state in the international system that still possesses a significant portion of the world's nuclear weapons. With a balanced nuclear weapons policy, the U.S. can take leadership of global nuclear disarmament efforts, potentially laying the foundation for a future multilateral nuclear arms reductions process with other nuclear states. Solving the world's most serious security issues is a key condition for any future multilateral nuclear arms negotiations to be viable. In addition, more nuclear reductions from the U.S. and Russia are likely required before other nuclear states would be willing to engage in any nuclear reductions process. The current lack of Russian nuclear cooperation does not preclude the U.S. from leading by example to show that a more modest nuclear posture and lower nuclear force levels are not only feasible and safe, but also advantageous. Even if nuclear disarmament is never achieved, U.S. efforts to shape the international nuclear landscape to one involving fewer nuclear-armed states, more modest nuclear postures, and small nuclear arsenals could lead to a safer international system. Such a nuclear future is certainly preferable to the current trajectory of the international nuclear environment that risks more states having larger nuclear arsenals and employing potentially dangerous nuclear postures.

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