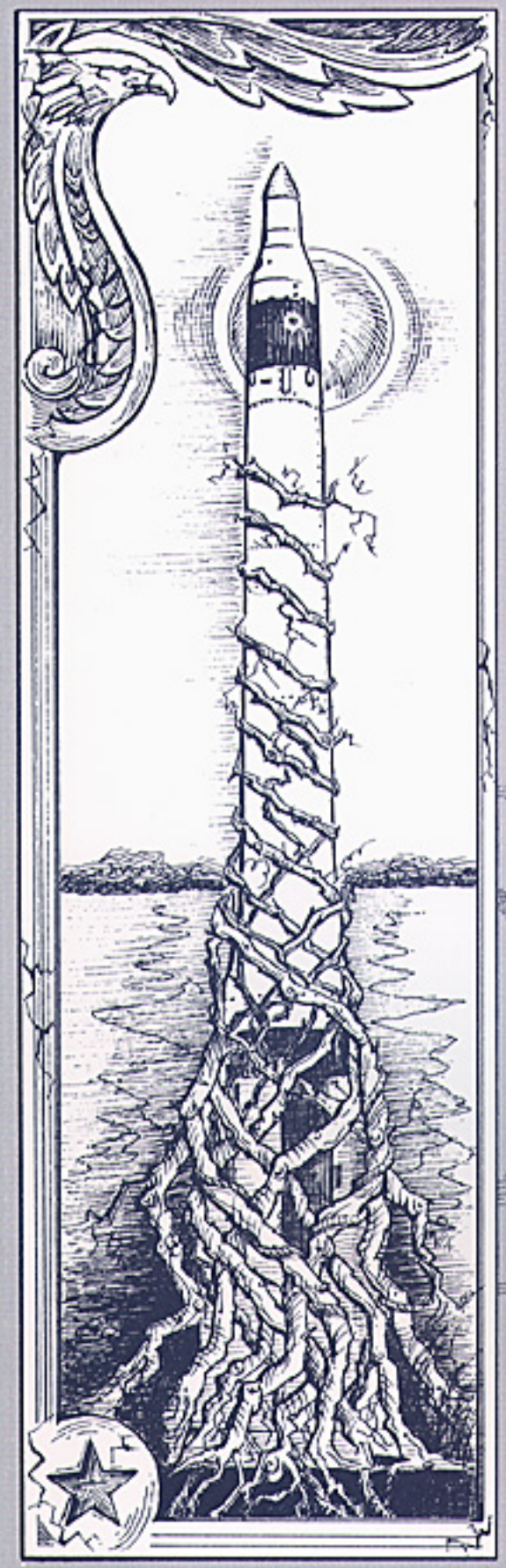

The Role Of US Nuclear Weapons in the Post-Cold War Era

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Maj, USAF

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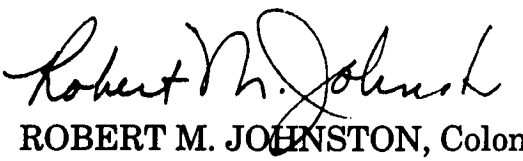
Foreword

The decade of the 1990s opened with a declining Soviet threat that ushered in an astonishing round of unilateral and bilateral nuclear arms reductions. While the dissolution of the Soviet Union has greatly reduced the possibility of global nuclear war, it has also increased third world instability, conflict, and proliferation of weapons of mass destruction. While the threat of chemical and nuclear weapons never materialized in Desert Storm, the next regional confrontation may not afford the United States such latitude.

Maj Rick Paulsen's study analyzes the role of United States nuclear weapons in this new, multipolar environment. He begins with a historical look at the role nuclear weapons have played in US defense policy since 1945. He reviews current unclassified guidance and the spectrum of public opinion on where the United States should be going with its nuclear weapons programs. He then surveys the potential threat of weapons of mass destruction. Major Paulsen concludes his study by suggesting nuclear force capabilities that would provide the United States with a viable deterrent for the post–cold war era. His recommendations address a broad range of issues that focus on developing a coherent nuclear strategy.



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About the Author

Maj Richard A. Paulsen

Maj Richard A. Paulsen completed this study as the last Strategic Air Command (SAC)-sponsored research fellow and one of the first two Air Combat Command (ACC)-sponsored research fellows at the Airpower Research Institute (ARI), Air University College for Aerospace Doctrine, Research, and Education (AUCADRE) at Maxwell Air Force Base (AFB), Alabama. Major Paulsen is a 1978 graduate of the United States Naval Academy, with a bachelor of science degree in electrical engineering. After graduation, he served as an electronics project engineer for five months at the Naval Ordnance Station at Indian Head, Maryland, while waiting to attend nuclear power training. Major Paulsen attended the Navy Nuclear Power School at Orlando, Florida, the Navy Nuclear Propulsion Prototype Plant at Windsor Locks, Connecticut, and the Officer Basic Submarine School at Groton, Connecticut. He reported to the USS *Lafayette* (SSBN 616) Poseidon missile submarine blue crew in January 1980. While on *Lafayette,* he completed three 70-day deterrent patrols and took the ship through a two-year refueling overhaul. During the course of his tour, Major Paulsen held the positions of electrical division officer, reactor control division officer, main propulsion assistant, communications officer, and reactor refueling officer. He received his gold dolphins on 23 March 1981 and passed the Naval Reactors Engineer's Exam prior to departing for the Air Force. Major Paulsen received an interservice transfer to the Air Force on 31

October 1983 and reported to the Air Force Weapons Laboratory at Kirtland AFB, New Mexico, for his first Air Force assignment. He served as the electromagnetic pulse (EMP) effects section chief and, later, as the technology branch chief in the nuclear technology office during his tour. In 1987 he was assigned to the Air Force Institute of Technology (AFIT) at Wright-Patterson AFB, Ohio, where he earned a master of science degree in operations research. After AFIT, Major Paulsen was assigned to the Force Analysis Division at SAC headquarters at Offutt AFB, Nebraska. In 1992 the commander of SAC selected him as a research fellow at ARI and as a student to concurrently attend Air Command and Staff College. He became an ACC-sponsored research fellow during the Air Force reorganization in June 1992. Major Paulsen is currently assigned to the Joint Staff, Force Structure, Resources, and Assessment Directorate (J-8) as a strategic analyst. He and his wife, Barb, were married in 1978 and have a daughter, Donna, and two sons, David and Daniel.

Preface

I arrived at SAC in January 1989 and was assigned to the Force Analysis Division, commonly referred to as "the vault." One of my key responsibilities was to support commander in chief Strategic Air Command (CINCSAC) with force structure analysis and, in particular, to provide the analysis for his yearly testimony before Congress. At that time, we vigorously provided analytical support to validate strategic force modernization requirements—132 B-2s, advanced cruise missile (ACM), short-range attack missile (SRAM) II, Peacekeeper Rail Garrison, small intercontinental ballistic missile (SICBM), and Trident submarines equipped with the D-5 missile. Then, unexpectedly, the threat disappeared—the Warsaw Pact disbanded, the Berlin Wall fell, and the Soviet Union disintegrated. President Bush canceled SRAM II, Peacekeeper Rail Garrison, and SICBM. He also reduced the B-2 buy to 20, the ACM buy to 640, and the Trident buy to 18. Additionally, the D-5 upgrade for the Pacific-based Tridents was postponed indefinitely.

It quickly became apparent that the Soviets were no longer being viewed as the threat. During the cold war, we validated force structure requirements based on the ability to sufficiently damage the Soviet targets delineated in our projected out-year target base. Without a specifically defined threat for the post–cold war era, force structure modernization was almost baseless.

Other factors became obvious to me. US theater nuclear policy had remained vague throughout Desert Shield and Desert Storm. Some individuals had espoused that the United States would maintain the "high moral ground" and not retaliate "in kind" even if Saddam Hussein attacked with chemical or nuclear weapons. After the Gulf War, it became evident that national attention was centering on the effectiveness of precision-guided conventional weapons as a possible replacement for nuclear weapons. The threat of weapons of mass destruction focused national attention around the need for better defenses against ballistic missile threats, nonproliferation efforts, and further arms control treaties. Concurrently, nobody seemed to question projected

Strategic Arms Reduction Talks (START) II levels. Further, radical arms control measures were tossed around—even in SAC headquarters. Suggestions such as actually demating warheads from ballistic missiles and keeping all submarines in port were posed as possible future postures.

I initially proposed my research to look at START II levels and beyond, focusing on the question, "How low can we go?" As I witnessed President George Bush's unilateral initiatives and the Washington Summit agreement, I realized that nuclear weapons levels over the next decade already had been decided. I began to ask myself, "On what are these tremendous force reductions based?" and "Does the United States have a plan for when nonproliferation efforts fail?" These questions led me to my research topic, "What is the role of US nuclear weapons in the post–cold war era?" One thing is for sure: there are a multitude of opinions being expressed.

I began my research with an examination of the role of nuclear weapons from a historical context. I then surveyed current unclassified national guidance regarding nuclear weapons. Following this, I examined the literature for what various proposals were being offered in the public sector as the future for US nuclear weapons. Due to the tremendous magnitude of literature on nuclear weapons, policy, strategy, and arms control, I chose to limit my coverage to a sampling of proposals that have been made over the last few years. I then looked at possible threats the United States may face over the next couple of decades. I limited this discussion to weapons of mass destruction, since these threats are most likely to draw a US nuclear response. Finally, I proposed some overall nuclear force characteristics that would provide the United States with a viable deterrent for the post–cold war era by maintaining the capability to respond across the full spectrum of conflict.

While the scope of this research is quite broad, I hope that many individuals will find it both useful as a starting point for performing more in-depth research on this subject and as a point of departure for discussing US nuclear force requirements for the post–cold war era. I could expand each chapter alone into a book. My only regret is that attending Air Command and Staff College did not afford me as much time as I would have liked.

I wish to thank many people for their help: Maj Mike Zenk for telling me about the ARI program and encouraging me to apply for the fellowship; Brig Gen Robert Linhardt for his initial vote of confidence as SAC/XP by recommending me for the program; Maj Gen James Hurley (ACC/XP) for taking me under his wing when SAC disappeared; Capt Bill Spindler for providing me with a great amount of historical background information; Lt Col Chuck Fletcher (AF/XOXI) for providing arms control expertise and feedback on my working draft; Col Steve Cheavens (ACC/XOON) and his shop for their valuable comments and suggestions; and Lt Col Bob Sberna (ACC/XPXT) for providing a good scrub of my final draft. Special thanks go to my reading group chairman, Dr Karl Magyar, and my editor, Dr Richard Bailey, for their valuable assistance in completing this document.

Finally, above all, I would like to thank my wife, Barb, for her loving support throughout this difficult year. She endured many lonely nights while I pounded away on the computer. I would also like to thank my daughter, Donna, and sons, David and Daniel. Although it was hard for them to understand why their dad spent so much time on the computer, they helped me to keep things in perspective and provided me with lots of support.

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Introduction

The nuclear arms race did an about-face in 1991 and became a disarmament race. The Strategic Arms Reduction Talks (START) treaty, signed in July 1991, marked the first time the United States and Soviet Union committed themselves to reducing the size of their strategic nuclear arsenals. The announcement of President Bush's initiatives in September 1991 marked an unprecedented step in nuclear disarmament—unilateral warhead reductions coupled with changes to the strategic nuclear alert posture and cancellation of some strategic modernization programs. These initiatives achieved their desired result when President Mikhail Gorbachev reciprocated in October 1991 with his own set of unilateral initiatives. Not to be outdone, President Bush quickly followed with a second set of initiatives in January 1992. By this time the Soviet Union had become the former Soviet Union and its new president, Boris N. Yeltsin, had also proposed a second set of unilateral initiatives. The Washington Summit agreement in June 1992 established the framework for the START II agreement signed in January 1993. This new agreement promises to reduce the number of US and Commonwealth of Independent States (CIS) strategic offensive nuclear weapons to approximately one-third of what they would have been under the START agreement.[1]

Amidst the fast snowballing of nuclear disarmament proposals rang the question, How low can we go? While most leaders seemed comfortable with the 3,000–3,500 level stated in the START II agreement, others suggest a much lower number. But before the United States can decide on how many nuclear weapons it needs, a more fundamental question must be answered: What is the role of US nuclear weapons in the post–cold war era? Until the United States establishes the mission of its nuclear arsenal, it cannot determine the number of weapons and delivery systems required and how the systems should be based and postured.

There are five main elements of nuclear policy—declaratory policy, acquisition policy, deployment policy, employment policy, and arms control policy.[2] Declaratory policy encompasses that which is known by the public from announcements through

the president or his staff. Acquisition policy includes plans for obtaining new capabilities and replacing aging weapons to ensure that the military can accomplish national security objectives. Deployment policy involves the way that nuclear forces are postured to support declaratory policy. Employment policy involves plans for the actual use of nuclear forces. Arms control policy comprises existing treaties and US negotiating positions regarding the reduction or elimination of various nuclear weapons and their delivery systems.

Amazingly, tremendous changes have been made to every nuclear policy except one—declaratory policy. Many strategists contend that nuclear weapons no longer serve any purpose other than to deter the minuscule possibility of a nuclear attack from the CIS. Yet such a view may be too rooted in the traditional bipolar world standoff between two superpowers.

The collapse of the Soviet Union has transformed the bipolar into a multipolar world in which ethnic and regional conflicts have reemerged to produce a much less stable world. Without the Soviet guarantee, numerous third world countries are scrambling for weapons of mass destruction and ballistic missile systems to deliver them.

While the United States has devoted major attention to the problem of proliferation, efforts to date have dealt with export controls. Unfortunately, these nonproliferation efforts will not solve the proliferation problem. Third world countries that want weapons of mass destruction will find ways to get them. Therefore, US nuclear policy must focus on how to achieve US national security objectives in future scenarios where third world weapons of mass destruction pose a threat.

For example, how would US national command authorities have responded in Desert Storm if one or more Scud missiles had been nuclear tipped? What about chemical or biological weapons? Would not an Iraqi attack on Israel with a nuclear or chemical warhead have elicited a different response from coalition forces? Would the United States have considered tactical nuclear weapons if Saddam Hussein had mounted an offensive during the early days of Desert Shield and overrun allied forces inflicting heavy casualties? Americans asked questions during the Gulf War, and they are not outside the realm of distinct possibilities for scenarios that the United States could face in the future.

Numerous other questions need serious contemplation. If nuclear weapons are to provide a deterrent against the use of nuclear, chemical, and biological weapons, as stated in US national military strategy, does the United States really intend to use them if deterrence fails? If there is no plan to use them, are they truly a deterrent? Will the United States have a credible deterrent to third world advances after destroying/dismantling all ground-launched tactical nuclear weapons, as announced by President Bush in his 27 September 1991 speech, or will the remaining US weapons have such large yields that the United States would never really employ them (self-deterrence)?

This book examines US nuclear policy in light of the US victory in Desert Storm and since the cessation of the cold war; identifies changes in US nuclear capability in light of START, the president's unilateral initiatives, and the Washington Summit agreement; explores potential future scenarios in which the United States could be faced with an enemy employing weapons of mass destruction; and evaluates the ability of US nuclear forces to meet anticipated national security objectives in light of these changes.

To provide a foundation from which to evaluate change in nuclear policy, chapter 1 provides a historical overview of the role of nuclear weapons and examines key events that have had a dramatic impact on bringing the 40-year cold war to an end and creating a changing perception on the need for and role of nuclear weapons. Chapter 2 examines current and ongoing changes in US nuclear policy since the Soviet threat declined, the success of conventional weapons in Desert Storm, and the flurry of arms control agreements and initiatives. Chapter 3 examines current public thinking on the future role of nuclear weapons and the potential impact of this thinking on US policy. Chapter 4 addresses possible future threats and threat scenarios, with particular focus on proliferation of weapons of mass destruction in the third world. Chapter 5 evaluates the ability of planned US nuclear forces to meet national security objectives in light of the possible threats and scenarios identified in chapter 4. Finally, chapter 6 summarizes the findings and makes recommendations for future research.

Notes

1. For the sake of clarity, I have used the term *Soviet Union* when speaking of the time frame prior to the 1991 dissolution and *CIS* for the time period since then.

2. The terms *policy* and *strategy* are used interchangeably by policy-makers and writers. Some writers prefer *strategy*. For example, see Col Dennis M. Drew and Dr Donald M. Snow, *Making Strategy: An Introduction to National Security Processes and Problems* (Maxwell AFB, Ala.: Air University Press, August 1988), 128. Some authors choose to use the term *policy*. For example, see Desmond Ball, *Targeting for Strategic Deterrence*, Adelphi papers no. 185 (Great Britain: Netherwood Dalton & Co. Ltd., Summer 1983), 37. Due to the tremendous number of quotes and references in chapter 1, I chose not to apply any strict definition to these terms; however, in my own usage, *policy* is used to denote more general national-level guidance, whereas *strategy* refers to more specific plans to apply a policy. Additionally, it should be noted that the term *doctrine* is also used interchangeably with these terms at times.

Chapter 1

Historical Overview of US Nuclear Policy

The history of nuclear weapons development, strategy, and policy is both vast and complex and would take many volumes to cover sufficiently. US nuclear policy and strategy have been in a state of evolution since 1945, reacting to changes in both US and Soviet nuclear capabilities. This chapter summarizes each administration's nuclear policies and highlights some of the major events that have affected changes to those policies. Particular emphasis is given to events that have had a dramatic effect in bringing an end to the cold war and beginning the nuclear disarmament process.

The Truman Era—Containment

On 16 July 1945 the Manhattan Project reached its fruition, and the nuclear age was born at the Trinity test site in New Mexico. Three weeks later, the *Enola Gay* dropped Little Boy on Hiroshima, providing the world with a dreadful picture of the horror of nuclear war. Three days later, Fat Man was unleashed on Nagasaki and Japan capitulated.

From 1945 to 1949 the United States was the world's sole nuclear power. President Harry S Truman saw nuclear weapons as strictly weapons of terror rather than serving military purposes. He sought to keep nuclear weapons from military control while also attempting to place nuclear weapons under United Nations (UN) international control through the (Bernard) Baruch plan. Although the UN plan failed, he was, successful in placing nuclear weapons under US civilian control through the Atomic Energy Act of 1946.[1]

Between 1946 and 1949, US war plans focused on the destruction of population, government control centers, and industrial complexes, which meant targeting Soviet cities.[2]

> The first US war plan, PINCHER (1946), called for an attack on 20 Soviet cities with 50 A-bombs. A subsequent plan, FLEETWOOD (1948), called for attacks on 70 Soviet cities with 133 bombs over a period of 30 days. Moscow was targeted with eight bombs and Leningrad with seven.[3]

The year 1947 marked the start of nuclear war plans based on prepared target lists, although urban-industrial targets continued to be the highest priority. That year also marked the date of the famous Truman Doctrine, which emphasized the policy of containment of communism. It was not until 1948, however, during the Berlin crisis, that a nuclear policy statement was issued at the presidential level. This policy, National Security Council (NSC)-30, was signed on 16 September 1948 and directed that the military plan for and be ready to use nuclear weapons in war; however, the decision to use nuclear weapons rested with the president. NSC-30 did not specify under what conditions nuclear weapons would be used, what targets would be struck, or how nuclear weapons were tied to national objectives. The NSC provided more guidance regarding US objectives later that year in NSC-20/4. It stated that the goal during an attack would be to "reduce or eliminate Soviet control inside and outside the Soviet Union," but it did not see unconditional surrender or occupancy of the Soviet Union as necessary.[4]

Three events in 1949 had a significant impact on the direction of the United States nuclear program. First, on 4 April, the United States signed the North Atlantic Treaty Organization (NATO) treaty, committing the United States to the defense of Western Europe. Second, a committee headed by Air Force Gen H. R. Harmon produced a report in May which concluded that the present US arsenal would not be sufficient to "bring about capitulation, destroy the roots of Communism, or critically weaken the power of Soviet leadership to dominate the people." Further, it stated that the Soviet's ability to "overrun Western Europe and the Middle East 'would not be seriously impaired'."[5] Third, the Soviets successfully exploded an atomic weapon in August and gained the capability to challenge US nuclear superiority.

These factors were influential in President Truman's decision to approve increases in nuclear production capability

three times during his last three years in office.[6] This expansion of nuclear production facilities provided the basis for the tremendous increase in US stockpile size over the next decade. Additionally, the Central Intelligence Agency (CIA) reports that the Soviets were working on a thermonuclear bomb influenced Truman to sign an executive order authorizing the development of a hydrogen bomb on 30 January 1950.[7] He issued a statement of rationale the following day.

> It is my responsibility as commander in chief of the armed forces to see to it that our country is able to defend itself against any possible aggressor. Accordingly, I have directed the AEC to continue its work on all forms of atomic weapons, including the so-called hydrogen or Super bomb.[8]

On 1 November 1952 the United States successfully entered the thermonuclear age. Ivy Mike was detonated at Eniwetok atoll, achieving a yield of 10.4 megatons.

> The Mike test was as important a milestone for the development of US thermonuclear weapons as the original Trinity test in 1945 had been for the development of fission weapons. The new hydrogen bomb was as great a leap in explosive power over the atomic bomb as the atomic bomb had been over conventional explosives: the Mike shot was 500 times as powerful as the Fat Man prototype detonated in New Mexico during Operation Trinity in 1945.[9]

Nuclear targeting strategy also shifted. With the Soviets capable of delivering nuclear attacks on the United States, the first priority became the destruction of Soviet nuclear delivery capability. Second priority was a retardation attack against Soviet capability to invade Western Europe. And third was attacks against "liquid fuel, electric power, and atomic energy industries."[10]

The presence of Soviet nuclear weapons also created concerns over the most efficient use of atomic weapons. Planners saw the value of striking the first blow; however, NSC-68, written in April 1950, "rejected on strategic and moral grounds, the idea of preventative war, that is, a war deliberately launched by the United States before the Soviet Union could become stronger."[11] It did see the value in maintaining the right to launch a preemptive attack.

> The military advantages of landing the first blow become increasingly important with modern weapons, and this is a fact which requires us to be on the alert in order to strike with our full weight as soon as we are attacked, and, if possible, before the Soviet blow is actually delivered.[12]

The Eisenhower Years—Massive Retaliation

"Where Harry Truman viewed the atomic bomb as an instrument of terror and a weapon of last resort, [President] Dwight Eisenhower viewed it as an integral part of American defense, and, in effect, a weapon of first resort." During his first year in office, Eisenhower began transferring nuclear weapons to the military "to decrease the vulnerability of the stockpile through dispersal and to increase operational readiness." He continued to do so throughout his term, to such an extent that "by 1961, less than 10 percent of the stockpile remained in civilian control."[13]

Both the Korean War and the Soviets' successful detonation of a hydrogen bomb in August 1953 were factors in shaping a new nuclear policy. "President Eisenhower and Secretary of State John Foster Dulles, convinced that their threat to use atomic weapons in Korea had ended the stalemate there, believed future conventional wars could be deterred by the threat of rapid escalation."[14] Eisenhower's nuclear strategy of massive retaliation was delineated in NSC-162/2, which was signed on 30 October 1953. The policy emphasized "a strong military posture, with emphasis on the capability of inflicting massive retaliatory damage by offensive striking power."[15] The strategy of massive retaliation was delineated publicly in Secretary of State Dulles's address to the Council on Foreign Relations in January 1954. He stated, "The way to deter aggression is for the free community to be willing and able to respond vigorously at places and with means of its own choosing," and the means of response "was to depend primarily upon a great capacity to retaliate, instantly."[16] Massive retaliation was also adopted as NATO's first nuclear strategy, MC 14/2, which was signed in December 1954.[17] This strategy was seen as a cheaper means of security as opposed to maintaining large standing armies in Europe to oppose Soviet expansionism.

Aside from massive retaliation, Eisenhower launched the United States into a massive tactical nuclear weapons program. NSC-162/2 stated:

> In the event of hostilities, the United States will consider nuclear weapons to be as available for use as other munitions. This statement . . . was seen by the JCS as an assurance that they could confidently plan for the use of nuclear weapons in both limited and general conflicts.[18]

The nuclear weapons complexes that were expanded under Truman provided the basis for the United States stockpile to grow from approximately 1,000 warheads in 1953 to approximately 18,000 by 1960.[19] Improvement in nuclear weapon pit designs and fusion technology greatly increased the yields of nuclear weapons from approximately 20 kilotons to several hundred kilotons and finally the megaton range. These improved designs reduced the weight of nuclear weapons substantially, making them employable on tactical aircraft, missiles, depth-charges, torpedoes, artillery shells, and land mines.[20] The United States successfully entered the age of battlefield nuclear weapons on 25 May 1953. A 280 millimeter (mm) artillery round was fired at the Nevada Proving Grounds, achieving a yield of 15 kilotons, or the equivalent of Little Boy.[21]

In March 1954 NSC-5410/1 was published, replacing NSC-20/4. It stated that the objective of the United States in general war was to "achieve a victory which will insure the survival of the United States." This statement created further discussion of preventive war, but the NSC continued to reject this option while retaining the option of preemption. In fact, President Eisenhower told his Joint Chiefs of Staff (JCS) that in the case of a Soviet attack on Western Europe, tactical weapons would be employed to delay their advance while Strategic Air Command (SAC) conducted a blunting attack.[22]

As the Soviets continued to expand their nuclear capability both in weapons and bombers, the effectiveness of the United States' ability to preempt an attack came under close scutiny. Eisenhower directed the development and deployment of several defensive systems including early-warning radar systems, interceptor aircraft, surface-to-air missiles (SAM), and the sound surveillance system (SOSUS) for the detection

of submarines. Additionally, alternate national and joint command posts were built for military and government leadership to provide the capability to relocate during a nuclear attack.[23]

The JCS were not all in agreement with Eisenhower's strategy of massive retaliation. Army Chiefs of Staff Matthew B. Ridgeway and Maxwell Taylor both argued against it from their tenure of 1953 through 1960. Both were convinced of the need to focus on conventional responses, particularly in the realm of limited conflicts. Taylor argued that massive retaliation offered "only two choices" and a flexible response strategy "would recognize that it is just as necessary to deter or win a limited war as to deter general war." He was concerned that using tactical nuclear weapons in a limited war would cause escalation.[24]

Nonetheless, Eisenhower continued to hang on to his strategy of massive retaliation. NSC-5602/1, signed on 15 March 1956, stated that nuclear weapons "will be used in general war and in military operations short of general war as authorized by the President." It also stated, "Such authorization could be given in advance."[25]

The Soviets' launching of Sputnik on 4 October 1957 propelled nuclear strategy into the space age. Ballistic missiles offered the ability to deliver nuclear weapons in a matter of minutes as opposed to hours. Ballistic missiles could not be intercepted like bombers, and thus defending the United States would not be possible. Eisenhower faced several critical decisions regarding the future of US nuclear forces.

> These included how to deal with bomber force vulnerability, what types and numbers of ballistic missile systems should be authorized, how forces should be based and targeted, and whether they were intended primarily for preemptive or retaliatory strikes.[26]

SAC responded to the need for immediate retaliatory strike by devising the ground alert concept. After conducting several tests, Gen Thomas Power directed that one-third of SAC's aircraft be placed on ground alert. This was accomplished in 1957, and a reorganization occurred in 1958 to support the concept. Although ballistic missile testing had been ongoing since the end of World War II, the first US intercontinental ballistic missile (ICBM) did not reach even a limited capability

until 1958. Atlas-D did not really become fully operational until 1960.[27]

Submarine-based missiles offered the promise of invulnerability to surprise attack. A Supplemental New Construction Program, signed on 11 February 1958, ordered the construction of three submarines that would carry the Polaris sea-launched ballistic missile (SLBM). The *George Washington,* the first US nuclear-powered ballistic missile submarine, was launched on 9 June 1959; it successfully fired a Polaris missile while submerged on 20 July 1960.[28] The strategic triad was officially born in November 1960, when the *George Washington* departed for its first deterrent patrol.[29]

Arguments between the Navy and the Air Force over nuclear missions and strategies were waged during the late 1950s. The Air Force felt threatened by the proposal of nuclear missile submarines. Adm Arleigh Burke proposed a concept of "finite deterrence" as an alternative to an escalating arms race. He observed that Soviet ICBMs made the blunting mission impossible and land forces vulnerable to surprise attack. Further, he stated that not only would hardening and defenses be expensive, but also that such measures would cause the Soviets to produce more powerful weapons in response. Finite deterrence rested on having a secure striking force. He argued that this would provide "time to think in periods of tension" by eliminating "the constant pressure to strike first in order to avoid being disarmed." It also provided the ability of selective and gradual response, the ability to "apply political coercion," and a stable nuclear state in which "neither side would be under pressure to expand its nuclear arsenal."[30]

The Air Force responded with the argument that the United States must continue to have the capability to destroy Soviet nuclear delivery capability. It argued that finite deterrence did not offer sufficient forces to deter limited acts of aggression or attacks on US allies; nor would it be able to protect the United States from surprise attack or provide the capability to preempt in the case of gradual escalation. Gen Thomas D. White, Air Force chief of staff, stated that "US policy must encompass the requirement for forces adequate to permit the United States to have initiative under all circumstances of war."[31]

Nuclear planning had been identified as a problem for two reasons. First, each unified or specified commander with nuclear forces prepared his own target list—supposedly unique to his own theater. However, there was overlap with regard to which targets each commander in chief (CINC) considered important to the defense of his theater.[32] Even though CINCs began meeting as early as 1955 to review one another's plans, as many as 300 out of 2,400 targets were duplicated in 1959. JCS chairman Nathan F. Twining sought to alleviate this problem by proposing a single integrated operational plan.

Second, the development of ICBMs and SLBMs was going to further exacerbate these problems. Gen Thomas S. Power recommended that SAC should have control of Polaris submarines to ensure coordination of planning. The Air Force proposed the formation of a strategic command in April 1959 in which the commander of SAC would be a specified commander. Secretary of Defense Thomas Gates did not concur with the ideas of a strategic command, but he was convinced of the need to integrate nuclear planning. Eisenhower approved Gate's proposal to establish a joint strategic target planning staff (JSTPS), which would be under SAC but manned with officers from all services.[33]

The JSTPS was tasked with developing the national strategic target list (NSTL) and the single integrated operational plan (SIOP). The NSTL listed possible targets that might be struck; the SIOP was the actual war plan that assigned weapons to targets. The first plan, SIOP-62, was completed in December 1960. It contained only a single plan, which was a massive response in which all nuclear forces would be launched with no reserve forces held back. It primarily targeted

> Soviet, Chinese, and satellite cities—whether by virtue of their value as urban-industrial targets or because of the location of numerous military and government control centers, as well as airfields and other military bases and facilities, within or on the outskirts of these cities.[34]

US strategic nuclear forces in 1960 were comprised of nine Atlas ICBMs, two Polaris submarines, 1,250 B-47s, and 450 B-52 bombers. The Soviets had 60-70 Bear, 100-120 Bison, and 1,000 Badger aircraft, and 35 SS-7/8 ICBMs.[35]

The 1960s—Flexible Response

When John F. Kennedy began his administration, he viewed the doctrine of massive retaliation as too inflexible. He ordered a revision of SIOP-62 to provide a variety of options. His staff drew up a set of planning guidelines to aid in this process:

- China and the satellite countries were separated from the USSR for targeting purposes.
- Soviet strategic forces were separated from Soviet cities on US target lists.
- Strategic reserves were held by the United States in accordance with the concept of intrawar deterrence.
- US command and control systems were to be protected to allow "controlled response."
- Soviet command and control was to be preserved, at least in the initial stages of any nuclear exchange.[36]

Using these guidelines, five options and several suboptions were provided to allow for a spectrum of responses. These options differentiated between Soviet nuclear forces, Soviet conventional forces not collocated with cities, Soviet forces near cities, Soviet command and control centers, and urban-industrial targets. SIOP-63 went into effect on 1 August 1962.[37]

Secretary of Defense Robert McNamara publicly acknowledged the pursuit of a "no-cities" counterforce strategy in January 1962. Testifying before the House Appropriations Committee, he stated that the "mission of the strategic retaliatory forces is to deter war by their capability to destroy the enemy's war-making capabilities." He further revealed that US plans included the capability to either target or spare cities. Other statements made by McNamara indicate that he saw retaliatory forces as useful in a damage limitation role by destroying any reserve Soviet nuclear weapons before they could be launched. He also saw the value of reserve forces in terminating hostilities on terms acceptable to the United States and as a deterrent against Soviet strikes on US cities.[38]

The no-cities counterforce strategy was made possible by the launching of US reconnaissance satellites in 1960 and 1961. These satellites provided comprehensive mapping of the Soviet Union, showing the location of strategic and other

military forces. They also laid to rest the missile gap theory in which the Soviet Union was thought to have a superior number of ICBMs.[39] That these satellites provided Kennedy with a clear picture of the superiority of US strategic forces was certainly a factor in his conducting the United States response to the Cuban Missile Crisis in October 1962 and threatening "full retaliatory response" against the Soviet Union in the event of missile launch from Cuba.[40]

Shortly after describing the no-cities counterforce strategy in an Ann Arbor commencement address, McNamara began to publicly retreat from this strategy for at least four reasons. First, counterforce strategy was being publicly criticized due to its first-strike implication. Second, Soviets discounted the credibility of a controlled counterforce war. Third, allies disagreed with a no-cities approach. Fourth, the services were using counterforce as a rationale for significant force development. Between 1964 and 1966, declaratory policy "included both Assured Destruction and Damage Limitation" as basic US strategic objectives. Although public discussion focused on these two policies, employment policy did not. The options and flexibility in the revised SIOP were never substantially changed. In fact, President Lyndon B. Johnson did not make any changes to strategic policy during his years in office.[41]

McNamara stated in the fiscal year (FY) 1966 defense budget:

> The strategic objective of our general nuclear war forces are (1) to deter a deliberate attack upon the United States and its allies by maintaining a clear and convincing capability to inflict unacceptable damage on an attacker, even were that attacker to strike first; [and] (2) in the event such a war should nonetheless occur, to limit damage to our populations and industrial capacities.[42]

He went on to define the first objective as "assured destruction" and the second as "damage limitation." While he did not specifically define how much capability constituted assurance, he suggested that "the destruction of, say, one-quarter to one-third of its population and about two-thirds of its industrial capacity . . . would certainly represent intolerable punishment to any industrialized nation and thus should serve as an effective deterrent."[43]

Between 1965 and 1966, McNamara began emphasizing assured destruction more than damage limitation, and by 1967 all focus was on assured destruction.[44] In January 1969 he wrote, "Achieving a significant damage limitation capability against the Soviet Union does not appear to be feasible with current technology."[45]

Assured destruction eventually became known as mutual assured destruction (MAD). MAD was never an official US policy. MAD doctrine asserts that strategic stability could be attained if both sides adopted a policy of assured destruction. The Soviets never accepted MAD, and thus it was only a theory.

Although assured destruction was being stressed within the United States, flexible response was adopted as NATO's doctrine in 1967. Flexible response sought to deter aggression through both nuclear and conventional forces at any level of aggression. The first use of nuclear weapons was left as an ambiguous option in response to superior numbers of Soviet and Warsaw Pact conventional forces.

The 1970s—Sufficient Deterrence and Countervailing Strategy

Like John F. Kennedy before him, Richard M. Nixon entered office with the desire to change the previous administration's nuclear policies. The Nixon administration identified three problem areas to fix. First, the extended deterrence policy for Europe lacked credibility, particularly from the United States declared strategy of assured destruction. Second, the United States lacked response options below that of major counterforce attacks, which were not useful in terms of limited options or an escalating war in Europe. Third, the Soviets had surpassed the United States in numbers of launchers and were building an antiballistic missile (ABM) system around Moscow.[46]

The Soviets had deployed 1,300 single-warhead ICBMs by 1970 (as compared to 1,054 on the United States' side) and were continuing to build more. Although the United States had a larger number of deployed SLBMs (656 launchers on 41 Polaris submarines, compared to 280 launchers on 40 Soviet

submarines), the Soviets were embarking on a massive submarine construction program.[47] Thus, the threat of the Soviets gaining strategic superiority was real. Nixon addressed these issues through continued force modernization, arms control, and new nuclear guidance.

Modernization efforts included the deployment of multiple independently targeted reentry vehicles (MIRV) on ICBMs and SLBMs. The first flight of 10, three-warhead Minuteman III missiles was deployed in June 1970. Over time, 550 of the 1,000 Minuteman missiles were converted to Minuteman IIIs. The conversion was completed in January 1975.[48] The first submarine to receive the 10-warhead Poseidon missile was the *James Madison*, which deployed in March 1971. A total of 31 *Lafayette*-class submarines were converted to Poseidon missiles. This conversion was completed in 1977.[49]

The Strategic Arms Limitation Talks (SALT) I agreement, signed in Moscow on 26 May 1972 by President Nixon and Gen Secretary Leonid I. Brezhnev, was a five-year interim agreement that froze the number of strategic ballistic missile launchers on both sides at then-current levels.[50] The ABM treaty, signed the same day, limited both sides to two limited ABM sites.[51] SALT I basically failed in that, while it capped the number of launchers, it permitted both parties to deploy MIRVs within those launchers and it did not address strategic bombers.

National Security Decision Memorandum (NSDM)-242 was signed on 17 January 1974 and became known as the (James) Schlesinger doctrine. It had two major thrusts. The first was "to provide more credible deterrence and escalation control through the development of a wider array of planned limited nuclear options." While Schlesinger acknowledged that some "limited" response options existed in the SIOP, he believed that they were too large for the enemy to "ascertain whether the purpose of the strategic strike was limited or not" and that they would be "virtually indistinguishable from an attack on cities." The new directive provided the president "the option of limiting strikes down to a few weapons." This approach boosted the credibility of NATO's threat of nuclear first use in the event of conventional defense failure.[52]

National Security Decision Memorandum (NSDM)-242 provided for escalation control by directing that plans be made

to allow the national command authorities (NCA) "the ability to execute their options in a deliberate and controlled fashion throughout the progress of a strategic nuclear exchange." It directed the development of "limited employment options," target "withholds" (such as population) that could be used for intrawar deterrence or bargaining, and the ability to control "the timing and pace of an attack execution, in order to provide the enemy opportunities to consider his actions."[53]

The second major thrust redirected the assured destruction strategy. NSDM-242 directed a counterrecovery strategy that required the destruction of 70 percent of Soviet industry. Not only was this mission the top priority for the next six years, but it significantly altered the SIOP from an emphasis on counterforce to that of counterindustrial.[54]

Another important aspect of NSDM-242 was that it "authorized the secretary of defense to promulgate the Nuclear Weapons Employment Policy (NUWEP)." The NUWEP "set out the planning assumptions, attack options, targeting objectives, and damage levels needed to satisfy the political guidance." NSDM-242 and NUWEP-1 were used by the JSTPS in developing SIOP-5, which went into effect 1 January 1976. Subsequent to this version, the JCS began publishing Annex C to the Joint Strategic Capabilities Plan (JSCP), translating the NUWEP into more specific requirements for the JSTPS.[55]

SIOP-5 contained four general categories of options: major attack options (MAO), selected attack options (SAO), limited nuclear options (LNO), and regional nuclear options (RNO). Targets were grouped into four categories: nuclear forces, conventional forces, military and political leadership, and economic and industrial facilities. SIOP-5 also provided for a strategic reserve force.[56]

The next changes to nuclear policy occurred when President Jimmy Carter took office in 1977. Carter entered office with the determination to reduce the United States nuclear arsenal and push for a strategy of minimum deterrence. He surprised the JCS by suggesting that 200 warheads deployed on submarines would be sufficient to deter a Soviet attack. Yet, Carter was the first president to "study seriously what his role in fighting a nuclear war would be like."[57] His study soon led to a different opinion.

President Carter issued Presidential Decision (PD)-18 in August 1977 after a detailed review of military posture and strategy. PD-18 "reaffirmed the continued use of NSDM-242 and NUWEP-1" while directing that three studies be conducted concerning strategic matters.[58] The most significant study was the Nuclear Targeting Policy Review (NTPR), which resulted in PD-59, signed in July 1980. PD-59 outlined a strategy that Secretary of Defense Harold Brown called "countervailing strategy." The basis for a countervailing strategy was "to take into account the specific values of the Soviet leadership, and specific operations for which the Soviet military prepares, in an effort to deny the perceived war aims of the Soviet government." In the words of Harold Brown, it is "aimed at what the *Soviets* think is important to them, not just what *we* might think would be important to *us*." Furthermore, he defined the capabilities needed to do this.

> We must have forces, contingency plans, and command and control capabilities that will convince the Soviet leadership that no war and no course of aggression by them that led to use of nuclear weapons—on any scale of attack and at any stage of conflict—could lead to victory, however they may define victory. Firmly convincing them of that fundamental truth is the surest restraint against their being tempted to aggression.[59]

Specifically, with regard to targeting strategy, PD-59 emphasized counterleadership and countermilitary targeting while deemphasizing counterindustrial.[60] PD-59 authorized the secretary of defense to release a new NUWEP, which was called NUWEP-80. NUWEP-80 downgraded the requirement for 70 percent damage on Soviet industry and emphasized the targeting of war-supporting industry as opposed to economic recovery facilities.[61] PD-59 also mandated that the United States "develop the capability to fight a protracted nuclear conflict, one that lasted months instead of days." This charge put a significant requirement on US strategic and command and control systems to survive a nuclear first strike and be capable of retaliation not only immediately but after a significant delay in response.[62]

Carter and Brezhnev signed SALT II in Vienna on 18 June 1979 and designed it as a "long-term comprehensive treaty" to "replace the Interim Agreement." The agreement, much like

SALT I, capped strategic nuclear delivery vehicles (SNDV). SALT II attempted to make up for the shortfalls of SALT I by capturing strategic bombers as well as ballistic missile launchers and limiting the number of MIRVed ballistic missiles.[63] SALT II, much like SALT I, merely capped the number of strategic delivery systems at then-current levels and did nothing to reduce nuclear force levels. Carter submitted the treaty for Senate ratification, but after the Soviets invaded Afghanistan in December 1979, he withdrew it from consideration and made Soviet withdrawal a condition for its resubmission.

Intermediate-range nuclear forces also were a concern for the Carter administration. NATO adopted a "dual-track" policy in 1979 in response to the tremendous Soviet buildup of theater nuclear weapons. These weapons were seen as a threat to the NATO strategy of flexible response. Of primary concern was the SS-20 ballistic missile, which had a range of 3,000 miles and carried three warheads. The dual-track policy called for the deployment of land-based, intermediate-range Pershing II ballistic missiles and Tomahawk cruise missiles in NATO while simultaneously engaging the Soviets to come to negotiating terms on limiting the number of SS-20s.[64]

The 1980s—Peace through Strength

Carter was severely defeated in 1980 by Ronald Reagan, who was both a critic of SALT II and a proponent for a strong national defense. In October 1981 President Reagan issued National Security Decision Directive (NSDD-13), which replaced PD-59. NSDD-13 required the capability to prevail "in a protracted nuclear war of up to 180 days." In July 1982 Secretary of Defense Caspar Weinberger issued NUWEP-82, which replaced NUWEP-80. These documents were used to develop SIOP-6, which put "emphasis on targeting Soviet leadership and relocatable targets."[65]

While SIOP-6 contained the same basic categories of targets and options as SIOP-5, each option carried a wide range of suboptions including "withholds." Withholds included "population centers, national command and control centers,

particular countries targeted in the SIOP, and 'allied and neutral territory'." Withholds were designed for escalation control, allowing for possible negotiations with Soviet leadership during the course of a conflict.[66]

Although SALT II was never ratified, President Reagan announced his intentions to comply with the treaty if the Soviets did so.

> As for existing strategic arms agreements, we will refrain from actions which undercut them so long as the Soviet Union shows equal restraint. With good will and dedication on both sides, I pray that we will achieve a safer world.[67]

At the same time, Reagan announced the upcoming Strategic Arms Reduction Treaty (START) negotiations, which were to address the shortfalls in SALT II by working toward nuclear arms reductions. START negotiations commenced on 29 June 1982 and took nine years to complete. While SALT II did contain several bans on new developments and modifications, it provided plenty of room for the United States and the Soviet Union to develop and deploy new systems.[68] Both nations took full advantage of the leeway. By the late 1980s, they had together amassed more than 50,000 nuclear weapons—enough to annihilate the world several times over. Approximately one-half of these warheads were deployed on strategic systems.

Strategic Modernization

The Soviets ran a massive, two-stage, "catch-up-to-the-Americans" nuclear program in the 1960s and the 1970s under Gen Secretary Leonid Brezhnev, although the program was not intentionally designed that way. The 1960s were characterized by a period of quantity increases, whereas the 1970s were a period of quality increases.

> These massive 1960s ICBM and SLBM development programs, largely centered on the SS-9 and SS-11 ICBMs and the SS-N-6/YANKEE SLBM/SSBN weapons systems, provided the foundation from which subsequent strategic nuclear modernization programs were to grow. The 1970s modernizations . . . were largely technical in nature.[69]

By 1981 "more than half of the 1,398 Soviet ICBM launchers [had] been rebuilt to house the SS-17, SS-18, and SS-19 ICBMs in vastly more survivable, hardened silos." These new

ICBMs were MIRVed and had a significant upgrade in accuracy to hold US ICBMs at risk. The Soviets had 950 SLBM launchers by this time. They were deploying *Delta*-class fleet ballistic missile (FBM) submarines with the SS-N-8 and MIRVed SS-N-18 SLBMs, and they were testing the SS-NX-20 missile to deploy on their *Typhoon*-class SSBN, which was in development. The Soviets also had deployed 156 Bear and Bison long-range bombers and 70 Backfires.[70]

US strategic programs over this same period had not been so vigorous. Reagan's agenda to correct this deficiency was no secret. His famous "Star Wars" speech on 23 March 1983 launched the nation on a strategic modernization program that would continue toward the end of the decade. He focused on the issue of deterrence:

> "Deterrence" means simply this: making sure any adversary who thinks about attacking the United States, or our allies, or our vital interests, concludes that the risks to him outweigh any potential gains. Once he understands that, he won't attack. We maintain the peace through our strength; weakness only invites aggression.[71]

He went on to say that "this strategy of deterrence has not changed. . . . But what it takes to maintain deterrence has changed." Citing statistics and using photographs, he compared and contrasted the Soviet nuclear buildup over the past 20 years to that of the United States and built a solid case for modernization before the American public.

> The United States introduced its last new intercontinental ballistic missile, the Minute Man III, in 1969, and we're now dismantling our even older Titan missiles. . . . Since 1969 the Soviet Union has built five new classes of ICBMs and upgraded these eight times. . . . Over the same period, the Soviet Union built four new classes of submarine-launched ballistic missiles and over 60 new missile submarines. We built two new types of submarine missiles and actually withdrew 10 submarines from strategic missions. The Soviet Union built over 200 new Backfire bombers, and their brand new Blackjack bomber is now under development. We haven't built a new long-range bomber since our B-52s were deployed about a quarter of a century ago, and we've already retired several hundred of those because of old age.[72]

Reagan's modernization programs included the B-1 bomber; the B-2 bomber; conversion of the B-52H bomber fleet to carry air-launched cruise missiles (ALCM); the advanced cruise

missile (ACM), a stealth replacement for ALCM; the short-range attack missile (SRAM) II, a replacement for SRAM A; the Peacekeeper missile; Rail Garrison, a rail deployment for Peacekeeper; the small ICBM (SICBM) program; the hard mobile launcher (HML), a mobile basing scheme for SICBM; the Trident submarine; the Trident I missile, which was deployed on the first eight Trident submarines; and the Trident II missile, which will be deployed on the remaining 10 submarines.

Reagan continued to support the NATO dual-track policy as well. When the Soviets broke off negotiations on limiting intermediate-range nuclear forces (INF), the United States responded with deployments of missiles beginning in December 1983. The US plan included 108 Pershing IIs for West Germany, with an additional 464 Tomahawks to be dispersed among the United Kingdom (UK), Netherlands, Italy, Belgium, and West Germany.[73]

Amidst the continued arsenal buildup, Soviet leadership changed hands four times. Brezhnev's death in November 1982 brought a period of uncertainty to US onlookers as his next two successors, Yuri Andropov and Konstantin Chernenko, also died during a span of only 28 months. Mikhail Gorbachev succeeded Chernenko as general secretary of the Soviet Communist party on 11 March 1985. Until Gorbachev took office, arms control negotiations with the Soviets had stalled.

> In January 1985, Secretary George Shultz and Soviet Foreign Minister Andre Gromyko agreed to separate but parallel negotiations on INF, strategic arms (START), and defense and space issues as part of a new bilateral forum called the Nuclear and Space Talks (NST). . . . Formal talks resumed in March 1985 in all three areas.[74]

Emphasis to Denuclearize

Almost immediately on taking office, Gorbachev began to announce economic, political, and military changes in accord with his now famous *glasnost* and *perestroika* policies. One of his most striking proposals was a plan to do away with nuclear weapons.

On 15 January 1986 Gorbachev unfolded a three-stage plan that called for "the complete elimination of nuclear weapons throughout the world" by the end of the 20th century. Stage

one, encompassing a period of five-to-eight years, called for the cessation of both nuclear testing and the transfer of missiles to other countries, the "complete elimination of medium-range missiles" from Europe, the reduction of strategic arsenals by one half, and the destruction of delivery vehicles above the capability to deliver 6,000 warheads. Stage two, to commence by 1990, called for a freeze on all new weapons production, a returning of all foreign-based weapons to sovereign soil, an elimination of all tactical nuclear weapons as defined by a range of less than 1,000 kilometers, and an agreement on the prohibition of developing space-strike weapons or nonnuclear weapons with destructive power approaching that of nuclear weapons. Stage three, to begin by 1995, called for the complete "elimination of all remaining nuclear weapons" by the end of 1999.[75]

Many individuals cite the Chernobyl Nuclear Power Plant accident as a key contributor to sustaining the Soviet drive to denuclearize. Occurring slightly more than three months after the three-step proposal, Chernobyl brought to the forefront a small picture of the dangers of nuclear war. Gorbachev used the accident to support his proposal.

> The accident of Chernobyl showed again what an abyss will open if nuclear war befalls humankind. For inherent in the nuclear arsenals stockpiled are thousands upon thousands of disasters far more horrible than the one at Chernobyl . . . more than 40 years ago the first atomic bomb was dropped on the Japanese city of Hiroshima, as a result of which hundreds of thousands of people perished. . . . The nuclear age forcefully demands a new approach to international relations . . . for the sake of putting an end to the disastrous arms race.[76]

Such a proposal provided hope in the West for a changing relationship with the Soviet Union, but beyond the rhetoric, there was no cessation or even a decrease in Soviet nuclear system production. Since the Soviets' actions did not match their declared intentions, the proposal remained dormant for another five years. On 27 May 1986 President Reagan cited three instances where the Soviets had violated US trust by breaching the SALT II and ABM treaties.

> I noted last June that the pattern of Soviet noncompliance with their existing arms control commitments increasingly affected our national security. This pattern also raised fundamental concerns about the integrity of the arms control process itself. A country simply cannot be

> serious about effective arms control unless it is equally serious about compliance. . . . The deployment of the SS-25, a forbidden second new intercontinental ballistic missile (ICBM) type, continues apace. The Soviet Union continues to encrypt telemetry associated with its ballistic missile testing in a manner which impedes verification. The Krasnoyarsk radar remains a clear violation. We see no abatement of the Soviet strategic force buildup.[77]

He went on to announce that the United States was no longer bound by the agreement but would temper its US response to the Soviet breaches.

> Given the situation, I have determined that in the future the United States must base decisions regarding its strategic force structure on the nature and magnitude of the threat posed by Soviet strategic forces and not on standards contained in the SALT structure. . . . Assuming no significant change in the threat we face as we implement the strategic modernization program, the United States will not deploy more strategic nuclear delivery vehicles than does the Soviet Union. Furthermore, the United States will not deploy more strategic ballistic missile warheads than does the Soviet Union.[78]

Another shift in nuclear strategy occurred in 1987. The counterrecovery mission was eliminated, and targeting the Soviet leadership was emphasized more strongly. Gen Larry Welch, Air Force chief of staff, stated that "literally thousands of industrial targets have been dropped from the SIOP."[79] Additionally, NUWEP-87 required a "prompt counter-leadership option." This was in response to the discovery of a tremendous network of underground hardened leadership bunkers around Moscow. Observers estimated "more than 1,500 hardened alternate facilities for more than 175,000 key Party and government personnel throughout the USSR." Arguments over the ability of Peacekeeper and Trident II missiles to destroy these "deeply buried" targets precipitated the development of earth-penetrating warheads that would burrow far into the ground before detonating.[80]

A major breakthrough in nuclear weapons negotiations occurred on 8 December 1987 with the signing of the Intermediate-Range Nuclear Forces (INF) Treaty, the first treaty to require the reduction in any nuclear weapons, albeit tactical.

> The treaty requir[ed] destruction of the sides' ground-aunched ballistic and cruise missiles with ranges of between 500 and 5,500 kilometers, their launchers and associated support equipment within 3 years after the treaty enter[ed] into force.[81]

This treaty was a preliminary sign of the changing climate in Europe.

Changing Soviet Policy in Eastern Europe

On 7 December 1988 Gorbachev detailed a significant change to Soviet policy in Europe before the United Nations. Some of his most striking comments involved his announcement of a unilateral reduction of 500,000 men from the Soviet armed forces and a reduction of 50,000 men and 5,000 tanks from countries in the Warsaw Pact.[82] The toll taken by the massive arms race was beginning to appear through the iron curtain.

> The priority allocation of resources to build large standing military forces created an additional burden on a Soviet economy already suffering from the effects of central economic planning on incentives and efficiency. The result has been a faltering industrial base, uneven technological development, an agricultural system incapable of adequately feeding its people, citizen disillusionment, growing health and environmental problems, and the waning of socialism's appeal to the third world.[83]

But Soviet strategic modernization continued. Testifying before the United States Senate Subcommittee on Strategic Forces and Nuclear Deterrence, Gen John T. Chain, commander in chief of the Strategic Air Command, stated:

> In the political arena, I applaud the present Soviet leadership's efforts at Glasnost and Perestroika and am encouraged by the warming of US-USSR relations. But, I recall the 1970s when we were enthralled with the promise of détente and were blind to the Soviet's massive strategic buildup. Therefore, I urge that we not forget the past and base our decisions on their observed actions rather than rhetoric.[84]

Further, he tied the necessity for continued strategic modernization to the pending START agreement:

> Modernization of offensive forces is essential in a START environment which places no limitations on air defenses, antisubmarine warfare, hardening, burying or dispersal of assets, and conventional forces. Rather than negating the need for modernization, START would underscore the need to complete and sustain strategic modernization.[85]

Over the next year, Warsaw Pact countries began to denounce communism and to move towards free elections. The fall of the Berlin Wall in November 1989 was one of the most

visible signs of the upheaval occurring within the Warsaw Pact. By mid-1990 East Germany, Poland, Hungary, Czechoslovakia, and Romania had held free elections. By August the threat of a Soviet invasion into Western Europe had diminished to the point that President George Bush announced the need for a new defense strategy.

The 1990s—Peace through Disarmament

President Bush's speech to the Aspen Institute on 2 August 1990 formed the foundation for the reshaping of US armed forces. In his speech he noted a diminished Soviet threat.

> We're entering a new era: the defense strategy and military structure needed for peace can—and must—be different. The threat of a Soviet invasion of Western Europe launched with little or no warning is today more remote than any other point in the postwar period.[86]

A New Defense Strategy

President Bush noted that not only had the Soviet threat diminished, but regional contingencies would shape US military needs for the future.

> Our task is to shape our defense capabilities to these changing strategic circumstances. In a world less driven by an immediate threat to Europe and the danger of global war—in a world where the size of our forces will increasingly be shaped by the needs of regional contingencies and peacetime presence—we know that our forces can be smaller.[87]

He went on to say that "our security needs can be met by an active force 25 percent smaller than today's." He defined the ceiling as "no more than the forces we need to guard our enduring interests," which he further defined as "forces to exercise forward presence in key areas" and forces "to respond effectively to crisis." The key to this strategy is to retain "the national capacity to rebuild our forces should this be needed."[88]

Bush stressed the need for 75 B-2s, 18 Tridents, and the development and completion of both the small ICBM and Peacekeeper Rail Garrison. This trend reflected a reduction from the previously planned 132 B-2s and 21 Tridents. Strategic programs that were not mentioned by Bush but were

still in the budget included the ACM, SRAM II, and D-5 missiles. The president also stressed the need for the Strategic Defense Initiative (SDI) more than ever. In the area of meeting the overall challenge, he stressed the need for active and inventive research, forces capable of rapid response, and readiness, which incorporates reconstitution as well as crisis response.

Bush's cautious approach to reducing planned strategic forces was due largely to the Soviets' continuance of modernization programs despite their proposal to eliminate nuclear weapons by the year 2000 and their tremendous economic problems. In the words of Secretary of Defense Dick Cheney,

> The intentions of that regime are changing. But intentions are not enough to support dramatic changes in our own level of preparedness. We must see fundamental and enduring changes in both the capabilities and character of Soviet military power.[89]

Paul Wolfowitz, under secretary of defense for policy, indicated that continued Soviet modernization, coupled with congressional indecision over authorizing US modernization programs, placed the United States at a continued disadvantage.

> The Soviet Union continues to modernize its strategic nuclear forces at a robust pace. This includes continued construction of modern SSBNs, three types of bombers, and three types of ICBMs, two in mobile variants. While we debate Peacekeeper rail garrison development, the Soviets continue with deployment of the train-mobile SS-24 missile, with its 10 warheads. While we debate research on the small ICBM, the Soviets are deploying hundreds of SS-25 road-mobile missiles. Last year alone, the Soviet Union produced 140 new ICBMs, where we produced 12 Peacekeepers, all spares. While we debate initial production of the B-2, the Soviets continue to build Blackjack, Backfire, and Bear-H bombers. Last year, the Soviets built 45 bombers; we produced one B-2.[90]

The single-warhead SS-25 road-mobile system and the MIRVed SS-24 rail-based system were of major concern to the United States, since they were survivable when deployed across the countryside. The Soviets also began to replace SS-19s with a silo-based version of the SS-24 and upgraded the SS-18 to provide a hard-target-kill weapon. In addition,

they introduced the Delta IV SSBN with the SS-N-23 missile and deployed six Typhoon SSBNs.

The Impact of Desert Storm

As if on cue, Saddam Hussein played the perfect straight man for Bush's prediction of a necessary US regional contingency emphasis, rolling into Kuwait the same day of the president's Aspen speech. Unfortunately, for Hussein, the lessening threat in Europe freed up US troops for Desert Shield. US experiences in Desert Storm further molded the new defense strategy.

Desert Storm produced at least four major impacts on the perception of both the continued need for US nuclear weapons and the need to keep nuclear weapons out of the hands of irrational actors. First, the tremendous success of high-tech conventional weapons convinced many people that highly accurate conventional weapons can accomplish almost any feat a nuclear weapon can. In fact, media coverage of these new capabilities gave the impression that destroying targets was as easy as playing a computer game.

Second, the quick victory against the fourth largest army in the world reinforced optimism among the American people of the superiority of the United States fighting machine. On the tail of the highly successful Grenada and Panama campaigns, the perception seemed to be that US conventional forces could achieve victory anywhere in the world.

Third, Cable News Network (CNN) television coverage of Scud missile attacks brought the stark reality of a third world chemical/biological threat to every home in America and many other homes around the globe. Rumors of Iraq's potential nuclear capability were on everyone's mind as well. The Iraqis' tremendous progress toward building a nuclear device, uncovered during the postwar inspections, further heightened world concern. The world and, in particular, Washington responded to these concerns over weapons of mass destruction with an increased focus on stepping up nonproliferation efforts and an increasing emphasis on developing ballistic missile defenses.

Fourth, Desert Storm set a precedent of multilateral participation. In future conflicts the United States will rely

more heavily on the United Nations to sanction required action and build coalition forces to respond. Gorbachev had stressed the importance of the UN in bringing about necessary international cooperation in his 1988 UN speech.

> The United Nations embodies, as it were, the interests of different states. It is the only organization which can channel their efforts—bilateral, regional, and comprehensive—in one and the same direction. . . . What is needed here is a united effort, the consideration of the interests of all groups of countries. This can only be ensured by such an organization as the United Nations.[91]

President Bush, who pioneered the effort to get as many nations as possible involved in Desert Storm, was quick to emphasize the success of the multinational effort and used it as a basis for declaring the changing world security environment to be a "new world order."

After the liberation of Kuwait, world attention was quickly refocused on Europe. Although 20 nations signed the Conventional Forces in Europe (CFE) treaty on 19 November 1990, the Soviets' reclassification of some of their forces to escape capture under the treaty created an impasse to US treaty ratification. Bush bullied Gorbachev by postponing an upcoming summit meeting and making the summit conditional on settling the CFE dispute and finalizing START. Quoting anonymous US officials, the *Washington Post* reported that "settlement of the conventional arms disputes must come before agreement on another treaty, START, limiting nuclear forces. And until START is completed, the White House has said Bush will not hold another summit with Gorbachev."[92]

Strategic Arms Reduction Talks

After resolving these disputes, President Bush and Soviet President Gorbachev signed the historic START treaty on 31 July 1991. The signing of this treaty marked a key milestone in thawing the strategic stalemate between the United States and the Soviet Union. The agreement took nine years to negotiate and was the first treaty between two superpowers to delineate reductions in strategic nuclear weapons and strategic nuclear delivery vehicles (SNDV).

Interestingly, although the START document runs 280 pages, it lists briefly on page one the only rationale.

> Conscious that nuclear war would have devastating consequences for all humanity, that it cannot be won and must never be fought,
>
> convinced that the measures for the reduction and limitation of strategic offensive arms and the other obligations set forth in this treaty will help to reduce the risk of outbreak of nuclear war and strengthen international peace and security, [and]
>
> recognizing that the interests of the parties and the interests of international security require the strengthening of strategic stability.[93]

Four key points can be gleaned from this brief statement. First, no one can win nuclear wars; hence, they should be avoided at all cost. Second, reducing the size of strategic offensive arsenals will help to reduce the risk of nuclear war. Third, reducing the size of the arsenals will foster international peace and security. Fourth, by implication, reducing the size of the arsenals will enhance strategic stability.

Once ratified by the Senate and entered into force, START provides a seven-year drawdown period. The START II treaty, discussed later, is basically overlaid on the START schedule and utilizes START protocol and verification procedures. Although the unilateral initiatives announced by Bush on 27 September 1991, the reciprocal initiatives announced by Gorbachev on 5 October 1991, the additional initiatives announced by the president in his State of the Union Message on 28 January 1992, Boris Yeltsin's counter-proposals on 29 January 1992, and the Washington Summit Agreement signed by Presidents Bush and Yeltsin on 17 June 1992 worked to arrive at much lower warhead levels, the importance of START should not be overlooked. President Bush called START "a fundamental milestone in reducing the risk of nuclear war—stabilizing the balance of strategic forces at lower levels, providing for significant reductions in the most threatening weapons, and encouraging a shift toward strategic systems better suited for retaliation than for a first strike."[94]

Under START, the number of "fast-fliers" ballistic missile warheads are reduced to no more than a total of 4,900 on each side, of which no more than 1,100 may be deployed on mobile ICBMs. The treaty limits the Commonwealth of Independent States (CIS) to no more than 1,540 heavy ICBM warheads (SS-18s). It limits total "accountable" warheads to 6,000 warheads on no more than 1,600 SNDVs. (The treaty defines an

SNDV as a single ballistic launcher, whether land- or sea-based, or a long-range bomber.) The 1,600 limit will result in a reduction of approximately 30 percent of total pre-START SNDVs.

Long-range bombers are counted at a discounted number, since bombers are deemed to be a more "stabilizing" strategic system. Penetrating bombers count only one warhead toward the 6,000 limit regardless of the number of bombs and SRAMs carried. The treaty also allows the United States to deploy up to 150 cruise missile carriers, loaded with up to 20 cruise missiles, but only counting 10 toward the overall 6,000 warhead limit. Beyond 150, the cruise missiles would be counted "as-equipped." The Soviets have similar rules. They are allowed 180 carriers counted at eight yet loaded at 16, and beyond that as-equipped. The net effect of the bomber counting rules is that rather than deploying merely 6,000 warheads, the United States would have approximately 9,500 strategic nuclear warheads, while the CIS would have approximately 7,500. This net effect is due to the United States advantage in long-range bombers. Overall, START provides a net reduction of approximately 35 percent in pre-START strategic nuclear warheads.

Sea-launched cruise missiles (SLCM) were of concern and were discussed during the talks. However, they were not captured under START. The two parties made a side agreement to limit the number of SLCMs to 880.

Beyond reducing the risk of nuclear war, President Bush delineated another advantage that START provides to national security: "Deterrence will indeed be enhanced as a result of the START Treaty and US modernization efforts can go forward with greater knowledge and predictability about future Soviet forces."[95]

The Disintegration of the Warsaw Pact

The disintegration of the Warsaw Pact occurred officially on 1 July 1991, when the presidents of Czechoslovakia, Bulgaria, Romania, and Poland, the prime minister of Hungary, and the vice president of the Soviet Union signed an agreement to dissolve both their military and political alliances. Albania withdrew from the pact back in 1968, and East Germany withdrew in September 1990, before the reunification of

Germany.[96] The major impact for strategic planners was a reduction of approximately 1,000 targets that US nuclear weapons had to hold at risk.[97] The loss of these buffer states also reduced NATO's concern for a Soviet overrun of Western Europe and decreased the need for maintaining a large arsenal of tactical nuclear weapons in Western Europe.

Unilateral Initiatives—Round One

On 27 September 1991 President Bush declared:

> The prospect of a Soviet invasion into Western Europe, launched with little or no warning, is no longer a realistic threat. The Warsaw Pact has crumbled. In the Soviet Union, the advocates of democracy triumphed over a coup that would have restored the old system of repression. The reformers are now starting to fashion their own futures, moving even faster toward democracy's horizon.[98]

He commented that the Soviets were questioning the need for a large nuclear arsenal.

> The Soviet nuclear stockpile now seems less an instrument of national security and more of a burden. As a result, we now have an unparalleled opportunity to change the nuclear posture of both the United States and the Soviet Union.[99]

He also suggested an approach to increased strategic stability.

> If we and the Soviet leaders take the right steps, some on our own, some on their own, some together, we can dramatically shrink the arsenal of the world's nuclear weapons. We can move to more effectively discourage the spread of nuclear weapons. We can rely more on defensive measures [and] on our strategic relationship. We can enhance stability and actually reduce the risk of nuclear war.[100]

In an unprecedented move, President Bush went on to announce a "series of sweeping initiatives affecting every aspect of our nuclear forces on land, on ships, and on aircraft."[101] His announcement cut through the rhetoric of arms control negotiations that had plagued negotiators for decades. He did in one night what negotiators had not been able to accomplish since the start of SALT I negotiations in November of 1969.

Perhaps even more amazing was the speed of the response from Mikhail Gorbachev on 5 October 1991, matching most of President Bush's initiatives and announcing strategic offensive cuts below the START level.

> We will make more radical cuts in our strategic offensive weapons than the treaty on strategic offensive weapons envisages. As a result, in seven years, we will have 5,000 nuclear warheads instead of [the] 6,000 envisaged by the treaty.[102]

He further upped the ante and proposed "that after the ratification of the treaty, the United States and Soviet Union begin negotiations of further radical cuts in strategic offensive weapons, approximately 50 percent." He concluded by stating that these steps were "approaching the goal proclaimed in 1986—a nuclear-free, safer, and more stable world."[103] Tables 1 through 3 provide a summary of the Bush and Gorbachev initiatives.

Table 1

Bush's and Gorbachev's Tactical Nuclear Weapon Initiatives

Bush Initiative 27 September 1991	Gorbachev Initiative 5 October 1991
– Eliminates worldwide inventory of ground-launched, short-range (theater) nuclear weapons (bring home and destroy)	– Will:
-- Nuclear artillery shells -- Short-range ballistic missile warheads -- Requests Soviets to do the same plus destroy nuclear warheads for air defense missiles and land mines	-- Destroy all nuclear artillery ammunition -- Destroy all nuclear warheads for tactical missiles -- Remove nuclear weapons from anti-aircraft missiles (will destroy some and store some) -- Eliminate all nuclear mines
– Withdraws all tactical nuclear weapons from surface ships, attack submarines, and land-based naval aircraft	– Will remove all tactical nuclear weapons from surface ships, multipurpose submarines, and ground-based naval aviation
-- Tomahawk cruise missiles from ships and submarines -- Nuclear bombs aboard aircraft carriers -- Dismantle and destroy many; store the rest in a cenral area -- Requests Soviets to do the same	-- Will destroy some and store some -- Proposes destroying all on basis of reciprocity
– Retains air-delivered nuclear capability in Europe	– Proposes removal of all nuclear bombs and missiles from front (tactical) aviation and storing them

Source: "Bush Announces U.S. Elimination of Short-Range Nuclear Arms," Reuter transcript of presidential address on national television, 27 September 1991, in *Congressional Quarterly* 49, no. 40 (5 October 1991): 2898–99; and Mikhail Gorbachev, "The U.S.S.R.'s Disarmament Measures," delivered to the nation, Moscow, USSR, 5 October 1991, in *Vital Speeches* 58, no. 2 (1 November 1991): 37.

Table 2

Bush's and Gorbachev's Strategic Nuclear Weapon Initiatives

Bush Initiative 27 September 1991	Gorbachev Initiative 5 October 1991
- Calls for prompt ratification of START	- Earliest possible ratification of START
- Stand down bombers from alert	- Heavy bombers will be removed from alert and their warheads stored
-- Calls for Soviets to confine mobile missiles to garrisons	- ICBM missiles on rail cars will be returned to storage
- Stands down all ICBMs scheduled for deactivation under START (Minuteman II)	- Removes from day-to-day alert 503 ICBMs including 134 MIRVed
-- Accelerate destruction after START ratification -- Ask Soviets to do the same	-- Early elimination not discussed
- Teminates development programs:	- Takes the following measures:
-- Mobile Peacekeeper (Peacekeeper rail garrison) -- Mobile portions of SICBM program -- Asks Soviets to terminate any ICBM program on systems with more than one warhead and limit ICBM modernization to one type of single missile system	-- Scraps plans to make new launchers for ICBMs on rail cars and modernize them -- Stops work on mobile, small-size ICBM --- Number of MIRVed mobile missiles will not increase
- Cancels SRAM II	-- Stops work on new, modified short-range missile for bombers -- Will remove three nuclear submarines with 48 launchers from active service
- Streamlines command and control: -- Consolidates under USSTRATCOM	- Puts all strategic nuclear weapons under single control and includes strategic defense into a single armed service

Source: "Bush Announces U.S. Elimination of Short-Range Nuclear Arms," Reuter transcript of presidential address on national television, 27 September 1991, in *Congressional Quarterly* 49, no. 40 (5 October 1991): 2898–99; and Mikhail Gorbachev, "The U.S.S.R.'s Disarmament Measures," delivered to the nation, Moscow, USSR, 5 October 1991, in *Vital Speeches* 58, no. 2 (1 November 1991): 37.

Table 3

Bush's and Gorbachev's Proposals

Bush Initiative 27 September 1991	Gorbachev Initiative 5 October 1991
– Seeks an early agreement to eliminate multiple warheads in ICBMs – – Use procedures already established in START	– No response
– Limits deployment of nonnuclear defenses against limited ballistic missile strike – Soon will propose additional initiatives on BM early warning	– Proposes to study possibility of creating joint systems to avert nuclear missile attack with ground- and space-based elements
– Explores cooperation in three areas: – – Safe & environmentally responsible storage, transportation, dismantling and destruction of nuclear weapons – – Enhancing physical security and safety – – Improving command and control to provide more protection against unauthorized or accidental use	– Ready to being detailed dialogue on: – – Development of safe and ecologically clean technologies to store and transport nuclear warheads – – Methods to utilize nuclear explosive devices – – Increased nuclear safety
	– Announces a cut in strategic offensive nuclear weapons to 5,000 rather than 6,000 and proposed to begin negotiations toward a 50% reduction – Declares one-year moratorium on nuclear weapons tests – Proposes reaching an agreement on controlled cessation of production of fissionable material for nuclear weapons – Calls for a joint statement to keep from making a first nuclear strike

Source: "Bush Announces U.S. Elimination of Short-Range Nuclear Arms," Reuter transcript of presidential address on national television, 27 September 1991, in *Congressional Quarterly* 49, no. 40 (5 October 1991): 2898–99; and Mikhail Gorbachev, "The U.S.S.R.'s Disarmament Measures," delivered to the nation, Moscow, USSR, 5 October 1991, in *Vital Speeches* 58, no. 2 (1 November 1991): 37.

At the time of his speech, President Bush attached two caveats to his unilateral initiatives—the B-2 and the Strategic Defense Initiative (SDI)—stating, "The United States must maintain modern nuclear forces, including the strategic triad, and thus ensure the credibility of our deterrent."[104]

The Downfall of Communism and the Soviet Union

In August 1991 Soviet hard-liners plotted a coup against Gorbachev. Although unsuccessful, the coup attempt caused considerable concern about who was in control of the Soviet Union's nuclear arsenal. Gorbachev disbanded the Communist party on 29 August. For the next three months, the world looked on with concern as Boris Yeltsin gradually displaced Gorbachev and pondered the possibilities of civil war among the republics.

The CIS was officially formed on 8 December 1991, when Russia, Belarus, and Ukraine declared the Soviet Union to be dissolved. By 21 December eight other republics had joined in the declaration. Of the four nuclear republics, the Ukraine and Byelorussia both indicated a desire to become "nuclear-free." This scenario left Kazakhstan as the only other republic (outside of Russia), indicating the possibility of holding on to its strategic nuclear weapons. Gorbachev completed the political transition, resigning as USSR president on 25 December 1991.

Two main concerns occupied the attention of most western observers during this transition period: first, the control of nuclear weapons and nuclear materials still present in many of the republics, particularly tactical nuclear weapons that may not be as accountable as strategic nuclear weapons; and second, the potential "brain drain" caused by the possibility of Russian nuclear scientists being hired by third world countries. Concern over the "loose nukes" was fourfold: (1) the potential for nonnuclear republics to obtain nuclear weapons; (2) the possibility of nuclear republics refusing to become nuclear-free; (3) the potential that the CIS may not be willing to adhere to the START treaty; and, perhaps the biggest concern, (4) the danger of nuclear weapons and nuclear materials being sold surreptitiously to third world countries.

The United States responded to these concerns in at least three ways. First, Congress authorized $400 million to help the CIS dismantle its nuclear weapons in the Soviet Nuclear Threat Reduction Act. Second, President Bush offered to share technology for better safety and security of nuclear weapons. Third, the president announced a second round of unilateral cuts in nuclear weapons with the hope that the CIS would do the same.

Unilateral Initiatives—Round 2

In response to Gorbachev's reciprocal measures to the 27 September initiatives, the dissolution of the Soviet Union, and the move towards democracy, Bush announced further unilateral initiatives in his State of the Union Address on 28 January 1992:

> Two years ago, I began planning cuts in military spending that reflected the changes of the new era. But now, with imperial communism gone, that process can be accelerated. . . . These are actions we are taking on our own—because they are the right thing to do.[105]

These initiatives are summarized in table 4.

Table 4

Bush's 28 January 1992 Initiatives

- Shuts down further production of the B-2 after 20 planes
- Cancels the Small ICBM program
- Ceases production of new warheads for sea-based ballistic missiles
- Stops new production of Peacekeeper
- Ceases purchase of any more ACMs

Source: George Bush, State of the Union Address delivered to Congress on 28 January 1992, in *Washington Post*, 29 January 1992, 14.

Additionally, he announced proposals for further reductions. These are summarized in table 5. He concluded this portion of his speech by reminding the American public that "the world is still a dangerous place." He cautioned against making any further cuts in the military.

Table 5

Bush's 28 January 1992 Proposals

- If Yeltsin will eliminate all ICBM MIRVs, the United States will
  - -- Eliminate Peacekeeper
  - -- Reduce all land-based ICBMs to one warhead
  - -- Reduce number of SLBM warheads approximately one-third
  - -- Convert a substantial portion of US strategic bombers to primarily conventional use

Source: George Bush, State of the Union Address delivered to Congress on 28 January 1992, in *Washington Post*, 29 January 1992, 14.

> We must not go back to the days of "the hollow army." We cannot repeat the mistakes made twice in this century, when armistice was followed by recklessness, and defense was purged as if the world were permanently safe.[106]

In response to President Bush's proposal, Yeltsin went on the air and announced his own set of initiatives. These initiatives are summarized in table 6. The news coverage made it impossible to tell how much of the announced strategic initiatives would have happened under the START treaty or what part of the tactical initiatives overlapped with Gorbachev's 5 October proposals. Yeltsin also announced some proposals for further reductions. These are listed in table 7.

Table 6

Yeltsin's 29 January 1992 Initiatives

- Take 600 sea- and land-based nuclear missiles off alert (1,250 warheads)
  - Eliminate or prepare to eliminate 130 silos
  - Terminate Bear-H and Blackjack production
  - Terminate air-launched and sea-launched cruise missile production
  - Destroy six submarine launch systems
  - Reduce SSBN alert patrols by 50%
  - Cease production of land-based tactical missiles
  - Eliminate one-third of sea-based tactical nuclear weapons
  - Eliminate one-half of nuclear warheads for antiaircraft missiles
  - Cut weapon purchases by 50% and defense budget by 10%

Source: R. Jeffery Smith, "Bush, Yeltsin Add Momentum to Reduction of Atomic Arsenals," *Washington Post*, 30 January 1992, 18.

Table 7

Yeltsin's 29 January 1992 Proposals

A limit of:
- 2,000–2,500 strategic nuclear weapons (total)

Mutually eliminate:
- All sea-based cruise missiles
- SSBN alert patrols

No longer:
- Target each other

Source: R. Jeffery Smith, "Bush, Yeltsin Add Momentum to Reduction of Atomic Arsenals," *Washington Post,* 30 January 1992, 18.

Secretary of Defense Dick Cheney did not consider Yeltsin's proposals to be in the best interest of the United States. He favored implementing START and the US-proposed additional cuts before any additional reductions.

Before new negotiations could begin, it was necessary to obtain the consensus of the four nuclear CIS republics with regard to honoring the START treaty, which was a formal agreement between the United States and the former Soviet Union. The biggest roadblock had been Kazakhstan's desire to retain its 104 SS-18 missiles. This roadblock was breached on 19 May, when the president of Kazakhstan met with President Bush and agreed to eliminate the weapons during the START drawdown period. By signing the START protocol on 23 May 1992, the four nuclear republics open the doors for the Washington summit.

Washington Summit and Strategic Arms Reduction Treaty II

At the Washington summit on 17 June 1992, President Bush and President Yeltsin agreed to "substantial further reductions in strategic offensive arms . . . and will promptly conclude a Treaty."[107] Bush and Yeltsin signed the treaty, START II, in Moscow on 3 January 1993. Table 8 lists the major provisions of the treaty.

Table 8

Strategic Arms Reduction Treaty II

Within the seven-year period following entry into force of the START Treaty, reduce strategic forces to no more than: – between 3,800 and 4,250 actual warheads – 1,200 MIRVed ICBM warheads – 650 heavy ICBM warheads – 2,160 SLBM warheads
By the year 2003: – reduce total warheads to no more than 3,000–3,500 actual – reduce SLBM warheads to no more than 1,700–1,750 – eliminate MIRVed ICBMs
New counting rules: – bomber warheads will count "as-equipped" – up to 100 noncruise missile heavy bombers may be reoriented to conventional roles and not count against overall total

Source: Statement released by the White House, Office of the Press Secretary, 18 June 1992, in *U.S. Department of State Dispatch* 3, no. 25 (22 June 1992): 492–93.

Even though START II made a quantum leap forward in nuclear arms reductions, several issues have yet to be addressed. START II, like START, did not address tactical nuclear weapons, SLCMs, the stockpile of nuclear warheads in storage, or nuclear testing. And although unilateral statements were previously issued regarding tactical nuclear weapons on both sides, verbal policy does not carry the same weight as a signed treaty.

Absent from the unilateral initiatives and START II is any detailed rationale for the reductions already agreed upon. According to President Bush, START II builds upon START

> by further reducing strategic offensive arms in . . . a way that further increases the stability of the strategic nuclear balance. It bans the most destabilizing type of nuclear weapons system—land-based intercontinental ballistic missiles with multiple independently targetable nuclear warheads. At the same time, the START II treaty permits the United States to maintain a stabilizing sea-based force.[108]

In a statement released by the White House press secretary, an additional emphasis is placed on the fact that the United

States views CIS heavy ICBMs as the most destabilizing weapons, and that START II "fully achieves a longstanding goal to eliminate completely heavy ICBMs."[109] President Yeltsin stated that the START II reductions are directed at the

> categories of arms which are of the greatest concern to the parties and the world. For the United States, these are submarine-launched ballistic missiles and heavy bombers; for Russia, land-based intercontinental ballistic missiles—ICBMs. This reduces the level of danger, military mistrust, and suspicion.[110]

Yet, no one has explained why all MIRVed ICBMs will be banned, even though SSBNs will retain MIRVed missiles. Additionally, a big difference between START and START II is the significant change in bomber-counting rules. For reasons of stability, bombers were incentivized under START, yet bomber weapons are counted the same as ballistic missile warheads under START II. No agency provided a public rationale for this change.

An Economical Approach to Arms Control

In many instances, the initiatives over the past year have taken a "least-cost" approach. President Yeltsin, speaking of START II, stated, "We have made our calculations, and they show that the proposed reductions would cost us much less than the mere maintenance of nuclear weapons systems in a safe condition." He also cited cost savings for verification, inspections, and physical destruction—the latter point being that the United States has offered to help the Russians in the destruction of their arsenal.[111] President Bush, as well, referred to the "cost-effective" manner in which START II allows reductions to be made. This includes the downloading of missiles on existing systems and the reorienting of nuclear bombers to a conventional-only role.[112]

It appears that, at least for the moment, the United States and CIS have reached a plateau in the denuclearization proposal process. Gorbachev's proposal of a nuclear-free world is a topic of "real-possibility" conversation, much more now than in 1986, when he first proposed it. Yet, the unrest caused by economic disaster and political tensions within the CIS could explode in another coup and jeopardize arms control progress to date. Additionally, third world countries continue

to seek weapons of mass destruction. Even if the United States is able to reduce to START II levels while saving money, and "in a fashion that is fully consistent with US national security," one still wonders if the force structure meets the requirements for the role of nuclear weapons in the post–cold war era.[113] Chapter 2 examines how the events of the past decade have affected US national security and national military strategy and how the United States plans to deal with the uncertain future.

Notes

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2. Rosenberg, 15.
3. Jeffrey Richelson, "PD-59, NSDD-13 and the Reagan Strategic Modernization Program," *Journal of Strategic Studies* 6, no. 2 (June 1983): 126.
4. Rosenberg, 12–14.
5. Harmon Report, as quoted in Sagan, 18.
6. Rosenberg, 23.
7. Larry H. Addington, *The Patterns of War Since the Eighteenth Century* (Bloomington, Ind.: Indiana University Press, 1984), 253.
8. Chuck Hansen, *US Nuclear Weapons: The Secret History* (New York: Crown Publishers, Inc., 1988), 47.
9. Ibid., 60.
10. Rosenberg, 17.
11. Sagan, 19–20.
12. NSC-68, as quoted in Sagan, 20.
13. Rosenberg, 27–28.
14. Sagan, 23.
15. Rosenberg, 28.
16. Speech of John Foster Dulles, as quoted in Russell F. Weigley, *The American Way of War: A History of United States Military Strategy and Policy* (Bloomington, Ind.: Indiana University Press, 1973), 403–4.
17. Bruce George, ed., *Jane's NATO Handbook: 1990–91* (United Kingdom: Jane's Information Group, 1990), 3.
18. Rosenberg, 31.
19. Ibid., 23.
20. For a detailed history of US nuclear weapons development, see Hansen.
21. Hansen, 172.
22. Rosenberg, 33–34.
23. Ibid., 32.
24. Weigley, 417–22.
25. NSC-5602/1, as quoted in Rosenberg, 40.
26. Ibid., 42.

27. Norman Polmar and Timothy Laur, eds., *Strategic Air Command: People, Aircraft, and Missiles*, 2d ed. (Baltimore, Md.: Nautical and Aviation Publishing Company of America, 1990), 49–50, 55, 299.

28. Richard Humble, *Submarines: An Illustrated History* (Belgium: Basinghall Books Limited, 1981), 141.

29. Rosenberg, 64.

30. Ibid., 54–55.

31. Ibid., 56–57.

32. Desmond Ball, "The Development of the SIOP, 1960–1983," in *Strategic Nuclear Targeting*, ed. Desmond Ball and Jeffrey Richelson (Ithaca and London: Cornell University Press, 1986), 59.

33. Rosenberg, 4–5, 58–62.

34. Ball, 62.

35. Institute for Strategic Studies, *The Communist Bloc and the Free World: The Military Balance 1960* (London: ISS, 1960), 3, 7.

36. Ibid., 62–63.

37. Desmond Ball and Robert C. Toth, "Revising the SIOP: Taking War-Fighting to Dangerous Extremes," *International Security* 14, no. 4 (Spring 1990): 67.

38. Ball, 64.

39. Ibid., 65.

40. Sagan, 31.

41. Ball, 67–68, 70.

42. Ibid.

43. Ibid., 69.

44. Ibid.

45. Sagan, 73.

46. Ibid., 39–41

47. The Soviets had 220 SS-7/8, 240 SS-9, 800 SS-11, and 40 SS-13 missiles. The United States had 54 Titan, 500 Minuteman I, and 500 Minuteman II missiles. Institute for Strategic Studies, *The Military Balance 1970–1971* (London: ISS, 1970), 1–2, 6, 9, 105–6.

48. Polmar and Laur, 121, 140.

49. R. T. Pretty, ed., *Jane's Weapons Systems* 1979–1980 (London: MacDonald and Jane's Pub., Inc., 1979), 19–20.

50. This consisted of 1,054 land-based ICBM launchers and 656 sea-based SLBM launchers for the United States and 1,618 ICBM launchers and 740 SLBM launchers for the Soviets. US SLBM launchers were "permitted to reach a ceiling of 710 launchers on 44 submarines" by dismantling "54 older ICBM launchers." Likewise, the Soviets could dismantle older ICBM systems and increase the number of their SLBM launchers to 950. *Arms Control and Disarmament Agreements: Text and Histories of the Negotiations Treaties* (Washington, D.C.: US Arms Control and Disarmament Agency, 1990), 167–68.

51. The treaty permitted each side to deploy one ABM site to protect its capital and one to protect an ICBM site. Each site is limited to 100 missiles and 100 launchers, and the sites must be at least 1,300 kilometers apart. See *Arms Control*, 155.

52. Sagan, 42–43.

53. Ball, 73.

54. Sagan, 44–45.

55. Ball, 74.

56. Ball and Toth, 67.

57. Thomas Powers, "Choosing a Strategy for World War III," *The Atlantic Monthly* 250, no. 5 (November 1982): 84, 95.

58. Ball, 76.

59. Sagan, 49.

60. Ibid., 50–53.

61. Ball, 79.

62. Richelson, 129.

63. The agreement limited "the number of strategic nuclear delivery vehicles—ICBM and SLBM launchers, heavy bombers, and air-to-surface ballistic missiles (ASBMs)"—to 2,400 on both sides, which were to be reduced to 2,250 by the end of 1981. The treaty sublimit for MIRVed ballistic missiles was 1,200, of which 820 could be land-based ICBMs. The total number of MIRVed ballistic missile launchers plus heavy bombers equipped to carry long-range cruise missiles could not exceed 1,320. *Arms Control*, 261–64.

64. *Jane's NATO Handbook*, 4.

65. Ball and Toth, 68.

66. Ball, 79–82.

67. Statement of the president, 31 May 1982, in *Weekly Compilation of Presidential Documents* 18, no. 22 (7 June 1982): 730.

68. SALT II banned the following: construction of additional fixed ICBM launchers; increases in the number of fixed heavy ICBM launchers; heavy mobile ICBM launchers; launchers of heavy SLBMs and ASBMs flight-testing or deployment of new types of ICBMs, with an exception of one new type of light ICBM for each side (the new system was limited to no more than 10 warheads); increasing the number of warheads on existing types of ICBMs (it also limited the number of warheads on SLBMs to 14, ASBMs to 10, and cruise missiles to 20 per existing heavy bomber); conversion of light ICBM launchers to launchers of heavy ICBMs; Soviet SS-16 ICBM; rapid-reload ICBM systems; long-range ballistic missiles on surface ships; and ballistic and cruise missile launchers on the seabeds. See *Arms Control*, 264–65.

69. Department of Defense, *Soviet Military Power 1981* (Washington, D.C.: Government Printing Office, 1981), 53–54.

70. Ibid., 54.

71. Statement of the president, 23 March 1983, in *Weekly Compilation of Presidential Documents* 19, no. 12 (28 March 1983): 443.

72. Ibid., 443–44.

73. *Jane's NATO Handbook*, 4.

74. *Arms Control*, 346.

75. Mikhail Gorbachev, statement before the Communist Party Central Committee, Moscow, USSR, 15 January 1986, in *Soviet Military Review* 5 (May 1986): 12–13.

76. Mikhail Gorbachev, "The Chernobyl Accident," delivered as a television address, Moscow, USSR, 15 May 1986, in *Vital Speeches* 52, no. 17 (15 June 1986): 517.

77. Statement of the president, 27 May 1986, in *Weekly Compilation of Presidential Documents* 22, no. 22 (2 June 1986): 707.

78. Ibid., 709.

79. Sagan, 53.

80. Ball and Toth, 74–76.

81. *Arms Control*, 345.

82. Mikhail Gorbachev, "U.S.S.R. Arms Reductions," delivered before the United Nations, New York City, 7 December 1988, in *Vital Speeches* 55, no. 8 (1 February 1989): 235.

83. Department of Defense, *Soviet Military Power: Prospects for Change 1989* (Washington, D.C.: Government Printing Office, 1989), 9.

84. Senate, *Department of Defense Authorization for Appropriations for Fiscal Years 1990 and 1991: Hearings before the Subcommittee on Strategic Forces and Nuclear Deterrence, Committee of Armed Services*, 101st Cong., 1st sess., 1989, pt. 6:71.

85. Ibid., 6:72.

86. George Bush, "United States Defenses: Reshaping Our Forces," delivered to Aspen Institute, Aspen, Colo., 2 August 1990, in *Vital Speeches* 56, no. 22 (1 September 1990): 677.

87. Ibid.

88. Ibid.

89. Department of Defense, *Soviet Military Power 1990* (Washington, D.C.: Government Printing Office, 1990), 5.

90. Senate, *Department of Defense Authorization for Appropriations for Fiscal Year 1991: Hearings before the Subcommittee of the Committee on Appropriations*, 101st Cong., 2d sess., 1990, pt. 2:313.

91. Gorbachev, "Arms Reductions," 232.

92. Ann Devroy and R. Jeffrey Smith, "Bush Urges Gorbachev to Drop Arms Treaty Claims," *Washington Post*, 26 March 1991, 6.

93. Arms Control and Disarmament Agreements, *START Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Reduction and Limitation of Strategic Offensive Arms*, United States Arms Control and Disarmament Agency, Washington, D.C., signed in Moscow on 31 July 1991, 1.

94. President George Bush, *National Security Strategy of the United States* (Washington, D.C.: The White House, August 1991), 15.

95. Ibid., 25.

96. "Death Knell Rings for Warsaw Pact," *New York Times*, 2 July 1992, 7.

97. Robert C. Toth, "U.S. Scratches Nuclear Targets in Soviet Bloc," *Los Angeles Times*, 19 April 1991, 1.

98. "Bush Announces U.S. Elimination of Short-Range Nuclear Arms," Reuter transcript of presidential address on national television, 27 September 1991, in *Congressional Quarterly* 49, no. 40 (5 October 1991): 2898.

99. Ibid.

100. Ibid.

101. Ibid.

102. Mikhail Gorbachev, "The U.S.S.R.'s Disarmament Measures," delivered to the nation, Moscow, USSR, 5 October 1991, in *Vital Speeches* 58, no. 2 (1 November 1991): 37.

103. Ibid.

104. "Bush Announces U.S. Elimination of Short-Range Nuclear Arms," 2899.

105. George Bush, State of the Union Address delivered to Congress on 28 January 1992, in *Washington Post*, 29 January 1992, 14.

106. Ibid.

107. Statement released by the White House, Office of the Press Secretary, 18 June 1992, in *U.S. Department of State Dispatch* 3, no. 25 (22 June 1992): 492.

108. Letter to the US Senate, 15 January 1993, Office of the Press Secretary, 1 January 1993, in *U.S. Department of State Dispatch* 4, no. 4 (25 January 1993): 53.

109. Fact Sheet released by the White House, Office of the Press Secretary, 1 January 1993, in *U.S. Department of State Dispatch* 4, no. 1 (4 January 1993): 5–6.

110. Opening remarks at a news conference on the signing of the START II Treaty, Moscow, Russia, 3 January 1993, Office of the Press Secretary, 1 January 1993, in *U.S. Department of State Dispatch* 4, no. 2 (11 January 1993): 20.

111. Ibid.

112. *U.S. Department of State Dispatch* 4, no. 4 (25 January 1993): 54.

113. Ibid.

Chapter 2

US Nuclear Policy after the Cold War

The last chapter examined some of the major events and decisions that have had and will continue to have a major effect on the post–cold war role of nuclear weapons. This chapter focuses on how those events and decisions have affected US nuclear policy. The primary unclassified source for current US nuclear policy is the *National Security Strategy of the United States.*[1]

National Security Strategy

US national security interests and objectives have not changed significantly since the beginning of the cold war. The 1991 *National Security Strategy* presents four main interests "that even in a new era are enduring":

> The survival of the United States as a free independent nation, with its fundamental values intact and its institutions and people secure.
>
> A healthy and growing US economy to ensure opportunity for individual prosperity and resources for national endeavors at home and abroad.
>
> Healthy, cooperative, and politically vigorous relations with allies and friendly nations.
>
> A stable and secure world, where political and economic freedom, human rights, and democratic institutions flourish.[2]

National security objectives are broad goals that flow from national interests. Accomplishment of national security objectives requires the use of political, economic, and military power. The majority of objectives supporting the first and fourth national security interests involve the use or potential use of military forces. These objectives are listed in table 9. Each objective either involves or could involve nuclear weapons.

President Bush's 2 August 1990 Aspen speech provided the foundation for the new national defense strategy. The *National Security Strategy* provides further amplification of this strategy. It states that "specific challenges facing our military in the 1990s and beyond will be different from those that have dominated our thinking for the past 40 years." The new defense strategy accounts for the decreased threat of global war and, in particular, the low probability of an invasion of Europe and seeks to offset the "competing fiscal demands" against a "still dangerous world." This new strategy deliberately reduces forces to "no more than the forces we need to defend our interests and meet our global responsibilities." It identifies four key needs that will shape future US military forces: strategic deterrence, forward presence, crisis response, and force reconstitution.[3]

Table 9

National Objectives Involving Military Forces

The United States seeks, whenever possible in concert with its allies, to:

- deter any aggression that could threaten the security of the United States and its allies and—should deterrence fail—repel or defeat military attack and end conflict on terms favorable to the United States, its interests, and its allies;
- effectively counter threats to the security of the United States and its citizens and interests short of armed conflict, including the threat of international terrorism;
- improve stability by pursuing equitable and verifiable arms control agreements, modernizing our strategic deterrent, developing systems capable of defending against limited ballistic-missile strikes, and enhancing appropriate conventional capabilities;
- promote democratic change in the Soviet Union, while maintaining firm policies that discourage any temptation to quest for military advantage;
- foster restraint in global military spending and discourage military adventurism;
- prevent the transfer of militarily critical technologies and resources to hostile countries or groups, especially the spread of chemical, biological, and nuclear weapons, and associated high-technology means of delivery;
- maintain stable regional military balances to deter those powers that might seek regional dominance;
- aid in combating threats to democratic institutions from aggression, coercion, insurgencies, subversion, terrorism, and illicit drug trafficking.

Source: President George Bush, *National Security Strategy of the United States* (Washington, D.C.: The White House, August 1991), 3–4.

The *National Security Strategy* discusses six areas that have a bearing on the future role of nuclear weapons. Strategic nuclear forces, nonstrategic nuclear forces, and missile defenses comprise elements of the national strategy of deterrence. Arms control and nonproliferation efforts are part of the US political agenda to pursue strategic stability. Finally, maintaining a technological edge is a key strategy to reducing the size of defense forces successfully.

Strategic Nuclear Forces

"Even in a new era, deterring nuclear attack remains the number one defense priority of the United States." The strategic triad has been the cornerstone of US nuclear deterrent posture for more than 30 years. The 1991 *National Security Strategy* continues to reaffirm the validity of the strategic triad and to advocate continued strategic modernization: "The modernization of our Triad of land-based missiles, strategic bombers, and submarine-launched missiles will be vital to the effectiveness of our deterrent in the next century."[4]

After the *National Security Strategy* was published, all modernization programs were severely curtailed by President Bush through his unilateral initiatives (discussed in chapter 1). Secretary of Defense Dick Cheney stated President Bush's position on strategic modernization just prior to leaving office.

> In signing the START I and START II treaties, the President has determined that, with the full implementation of these agreements, the residual US arsenal can, with appropriate modernization, provide the effective and flexible nuclear deterrent that will be required for the foreseeable future. Efforts to extend the service life of the existing Minuteman III ICBM force, along with the previously authorized introduction of the B-2 stealth bomber in the mid-1990s and completion of the 18-ship Ohio-class ballistic missile submarine force in 1997, are the extent of the modernization efforts currently planned.[5]

Survivable command and control, nuclear weapon safety, security and testing, and safe and environmentally sound nuclear weapons production capability continue as important national security issues. President Bush announced a change to US nuclear testing policy in July 1992. He stated that the United States will continue its policy of performing nuclear

tests; but will restrict the purposes of those tests to safety and reliability purposes. Congress subsequently placed further restrictions on US testing. It decreed:

> A nine-month moratorium on US testing beginning in October 1992, ceilings of 15 tests from July 1993 through September 1996 and of five tests for any single year, and a ban on tests beginning in October 1996 unless another state tests after that date. It further restricted the purpose of tests to weapons safety, but allowed one test per year for reliability unless Congress specifically disapproved of the test.[6]

While the strategic triad was well suited for deterring the Soviet threat, the new era presents several additional concerns.

> While we have traditionally focused on deterring a unitary, rational actor applying a relatively knowable calculus of potential costs and gains, our thinking must now encompass potential instabilities within states as well as the potential threat from states or leaders who might perceive they have little to lose in employing weapons of mass destruction.[7]

Yet, the *National Security Strategy* does not propose a solution to such potential scenarios; it merely continues to tie US conventional capability to strategic weapons through the linkage of nonstrategic nuclear weapons.[8]

Nonstrategic Nuclear Forces

Nonstrategic nuclear weapons will continue to play a role in US *National Security Strategy* for the foreseeable future. They act to highlight US resolve and to "link conventional defense to the broader strategic nuclear guarantee of the United States." Additionally, nonstrategic nuclear weapons have "contributed to the deterrence of conventional attack." This has been particularly true in NATO.

> Non-strategic nuclear weapons remain integral to our strategy of deterrence. They make NATO's resolve unmistakably clear and prevent war by ensuring that there are no circumstances in which a nuclear response to military action might be discounted.[9]

The *National Security Strategy* also cites nonstrategic nuclear weapons as part of the US nonproliferation strategy. That these weapons are a link to the strategic guarantee has "helped remove incentives that otherwise might have accelerated nuclear proliferation." Additionally, US possession

of nonstrategic nuclear weapons has helped deter enemy use of nonstrategic nuclear weapons.[10]

President Bush's 27 September 1991 initiative made some major changes to nonstrategic nuclear forces. The announcement that all ground-launched nuclear weapons were to be brought home and destroyed removed the Army from any future nuclear role. The decision to remove all nonstrategic nuclear weapons from naval vessels limited the Navy's peacetime nuclear role to strategic deterrence only. The Air Force will retain the only peacetime nonstrategic nuclear mission, via an air-delivered capability in Europe.

Missile Defenses

President Reagan's "Star Wars" speech on 23 March 1983 launched the US Strategic Defense Initiative (SDI) program, which "was intended to shift deterrence to a safer, more stable basis" by limiting Soviet capability to launch a successful ballistic missile attack on the United States. Although the threat of an attack from the former Soviet Union has greatly diminished, the "threat posed by global ballistic-missile proliferation and by an accidental launch resulting from political turmoil has grown considerably."[11] Desert Storm provided a heightened awareness to the American public of the potential dangers of ballistic missile attacks, both to troops on the battlefield and to undefended cities. The Soviet coup attempt in August 1991 heightened US concerns over the possibilities of unauthorized launches.

In light of the decreasing defense budget and the receding threat of a Soviet nuclear strike, the SDI program has been scaled back to the global protection against limited strikes (GPALS) program. GPALS provides protection against an unauthorized or inadvertent nuclear launch and helps to "enhance strategic stability and reduce the risk of nuclear war" by improving survivability, "remov[ing] incentives for a nuclear first strike" and "implement[ing] an appropriate relationship between offenses and defenses."[12] It is envisioned that GPALS would protect against "launches of up to 200 warheads."[13]

GPALS also may "provide incentives against further proliferation of ballistic missiles" in two ways. First, by

decreasing the potential for missiles to "cause certain and immediate damage," governments may be less likely to "go to such great lengths to acquire them." Second, the offering of US defensive assistance may "provide an incentive for countries not to seek ballistic missiles or weapons of mass destruction."[14]

Subsequent to the 1991 *National Security Strategy*, Presidents Gorbachev and Yeltsin both proposed the development of joint systems to avert nuclear ballistic missile attacks. Later, Presidents Bush and Yeltsin signed a joint statement on 17 June 1992, committing both nations to explore the role of and develop a concept for a global positioning system (GPS).

Arms Control

The *National Security Strategy* stipulates that "arms control is an important component of a balanced strategy to ameliorate the deadly consequences of global tensions as well as to reduce their fundamental causes." The United States seeks to "enhance the security of the United States and its allies while strengthening international stability by":

- Reducing military capabilities that could provide incentives to initiate attack;
- Enhancing predictability in the size and structure of forces in order to reduce the fear of aggressive intent;

[and]

- Ensuring confidence in compliance, through effective verification.[15]

The tremendous success in arms control treaties from INF to START II was discussed in chapter 1. Beyond the success of treaties, President Bush stated that the arms control process has changed significantly.

> Instead of merely damping competition, arms control now plays a major role in creating the framework for cooperation. . . . In some areas, particularly with the independent states of the former Soviet Union, we can now afford to take unilateral steps, often based on anticipated reciprocity. In others, we continue to require formal agreements, but those can be arrived at far more quickly than before.[16]

Another breakthrough in arms control occurred on 13 January 1993, when the United States became an original signatory to the Chemical Weapons Convention. "The convention prohibits the

development, production, acquisition, stockpiling, retention, and transfer of chemical weapons" and "the use of chemical weapons against any other state—regardless of whether the country is a signatory to the convention." Additionally, it seeks to eliminate chemical weapons within 10 years.[17]

This step has significant ramifications for the United States. Some nations may not sign or abide by the treaty. Having already forsworn biological weapons, the United States now will not respond in kind to either chemical or biological attack. The implications of this policy are discussed in chapter 5.

Proliferation

The *National Security Strategy* identifies "stopping the global proliferation of nuclear, chemical, and biological weapons, as well as the missiles to deliver them" as the most urgent issue in arms control.[18] President Bush proposed a "three-tiered strategy: to strengthen existing arrangements; to expand the membership of multilateral regimes directed against proliferation; and to pursue new initiatives."[19] The thrust of this program strengthens efforts to stop proliferation via supply-side economics—controlling export of critical technologies, weapons, and components that can be used as building blocks for the development of weapons of mass destruction.

President Bush released a nonproliferation initiative on 13 July 1992. The initiative is aimed at "integrat[ing] new and existing policies in an overall framework to guide US nonproliferation policy in the years ahead."[20] In seeking compliance and enforcement of international norms, supporting inspections, helping weapons destruction, and enforcing export controls, the United States will continue to work through numerous groups and agencies. The Nuclear Non-Proliferation Treaty (NPT), Nuclear Suppliers Group (NSG), and International Atomic Energy Agency (IAEA) all seek to control nuclear proliferation. The Missile Technology Control Regime (MTCR) is aimed at combating missile proliferation. The Australia Group, Chemical Weapons Convention (CWC), Biological Weapons Review Conference (RevCon) and Enhanced Proliferation Controls Initiative (EPCI) deal with the control of chemical and biological weapons.

Additionally, although not mentioned in the initiative, the Coordinating Committee for Multilateral Security Export Control puts export controls on critical technologies.[21]

Technology

The *National Security Strategy* emphasizes the importance of maintaining a technological edge as the size of military forces and the defense budget are reduced. High-technology weapons provide the capability to "overcome numerical disparities and to reduce the risk to American lives," offer a "hedge against the unknown," and give the president flexibility in response options.[22] While the Gulf War validated the capabilities and value of high-technology weapons, and although there has been much widespread discussion that such technology can begin to replace nuclear weapons, no mention of any such policy appears in the US national security strategy.

National Military Strategy

The *National Military Strategy of the United States* "implements the new, regionally focused defense strategy described in the President's *National Security Strategy of the United States* and builds upon the *Annual Report to the President and Congress* provided by the Secretary of Defense." As such it is the responsibility of the chairman of the Joint Chiefs of Staff to advise "in providing strategic direction for the Armed Forces."[23] Since the national military strategy builds on the national security strategy, a thorough analysis would be redundant to what already has been covered. However, four issues within the document hold special meaning to the discussion within this analysis.

First, deterrence of nuclear attack on the United States and its allies has been the primary role of US nuclear weapons for many years. While the *National Security Strategy* also includes deterrence of conventional attack, particularly with regards to the NATO flexible response strategy, it does not mention the role of nuclear weapons in deterring chemical or biological attacks. The *National Military Strategy*, however, states

specifically that the role of nuclear weapons includes chemical and biological weapons deterrence.

> The purpose of nuclear forces is to deter the use of weapons of mass destruction and to serve as a hedge against the emergence of an overwhelming conventional threat.[24]

As mentioned earlier, with the signing of the Chemical Weapons Convention, the US policy on chemical use is no longer "no first use" but "no use." The significance of a lack of declaratory policy from the president will be discussed in the remaining chapters.

Second, while traditionally nuclear deterrence has been defined in terms of nuclear systems and warning systems, and while the value of defenses in providing a deterrent capability has been discussed since SDI was initiated, the *National Military Strategy* adds GPALS as one of the prerequisites for deterrence.

> A credible deterrent *requires* [emphasis added] a reliable warning system, modern nuclear forces, the capability and flexibility to support a spectrum of response options and a defensive system for global protection against limited strikes.[25]

The role of defense and its impact on the future role of nuclear weapons also will be discussed in the remaining chapters.

Third, the *National Military Strategy* identifies the adaptive planning process as the key to meeting regional challenges with a smaller force structure. This process provides options to US national leadership with a "diverse spectrum" of "preplanned options" to confront "any opponent's leadership with uncertainty and risk should it contemplate aggression of any kind to include the use of nuclear, chemical, or biological weapons."[26] This necessitates detailed planning and flexible forces to respond to a full spectrum of possible scenarios.

> Detailed target planning is done to enhance responsiveness and provide options. Specific target selection and the alert status of the force are functions of the world situation at any particular point in time.[27]

Fourth, the JCS document set forth the base force concept to meet "our enduring defense needs" while "maintain[ing] an acceptable level of risk."[28] The base force strategic forces are composed of 18 Trident submarines, 50 Peacekeeper and 500 Minuteman III missiles, and unspecified numbers of B-1,

B-52, and B-2 aircraft. When the chairman of the JCS first released his base force concept, it had included 75 B-2s, 95 B-52Hs, and 97 B-1Bs.[29] These numbers disappeared with the onset of the unilateral initiatives and Washington Summit agreement. President Bush lowered the ceiling for B-2s to 20 during his 28 January 1992 State of the Union Address. START II allows up to 100 formerly heavy bombers to be used as conventional bombers. Secretary of Defense Cheney stated:

> The B-1Bs will be reoriented to a conventional role [from a nuclear role] and will not be counted under START [II]. Under the START II Treaty, the US-planned nuclear long-range bomber force will consist of B-2s equipped with gravity bombs and B-52H standoff cruise missile carriers, armed with a mix of ALCM-Bs and ACMs.[30]

This concession provides the United States with options for its heavy bombers, many of which could not be maintained under the START II limits with the as-equipped counting rules for bombers. Regardless of the actual force structure, the *National Military Strategy* continues to affirm the policy of deterrence based on the strategic triad.

The Strategic Triad

Gen John T. Chain, Jr., then commander of the Strategic Air Command, iterated the link between deterrence and force structure in his testimony before the Senate Appropriations Committee on 3 May 1990:

> Since World War II, deterrence, based upon highly capable nuclear forces, has been the cornerstone of our nation's military strategy. To support this strategy, we have fielded forces that have convinced the Soviets they could not launch a successful attack against the US or its allies. The Soviet Union is, and will remain, a nuclear superpower. Therefore, a Triad of US strategic offensive forces will remain essential to deterrence.[31]

Secretary of the Air Force Donald B. Rice and Air Force Chief of Staff Gen Merrill A. McPeak presented the fiscal year (FY) 1992 Air Force Posture Statement to the House Armed Services Committee on 26 February 1991. In it, they stated the rationale for the continued validity of the strategic triad:

> The TRIAD concept remains fundamental. Each leg of the TRIAD possesses unique and complementary characteristics which

synergistically provide a retaliatory capability that no adversary could hope to successfully overcome.[32]

The triad concept was well suited for the cold war. It provided insured survivability of nuclear forces for the worst-case scenario—a surprise bolt-out-of-the-blue attack. The triad also addressed concerns about the possibility of technological breakthroughs or system failures that could render a leg of the triad inoperative. The triad approach ensured that at least one leg was available to hedge against such attack or failure. While these concerns are not as paramount in the post–cold war era, the triad concept is still valid to hedge against future uncertainties.

Bombers

The penetrating bomber was the first strategic nuclear delivery platform. After the advent of the ballistic missile, it continued to perform a vital strategic mission as a member of the triad. Still, some individuals criticized it as being an antiquated system that was no longer needed, while others suggested its role as merely a hedge against the failure of one of the other legs of the triad. These arguments were faulty for two reasons. First, as the size of the target base began to grow, the number of Soviet targets exceeded the number of ballistic missile warheads, requiring bomber weapons to cover the target base. Second, bomber-delivered weapons were more accurate than ballistic missile warheads and thus were necessary to ensure that an adequate level of damage was achieved on many targets. This second point became touted as an extremely important mission for the bomber—the bomber could perform damage assessment and release a second weapon against a target that had been missed or insufficiently damaged by a ballistic missile.

In response to the penetrating bomber threat, the Soviets built a large network of air defenses. The B-52's inability to penetrate these defenses provided the argument for modernizing the bomber fleet (through the B-1B and the cruise missile programs). The Soviets continued to modernize their surface-to-air missile (SAM) systems, which fueled the argument for further US modernization. The advanced cruise

missile (ACM) and the B-2 bomber employed stealth technology, a capability that reduces the ability of Soviet radars to "see" an incoming system. The short-range attack missile (SRAM) II, an improved standoff weapon, was planned as well, allowing bombers to launch weapons longer distances from their targets.

In the midst of arms control talks that focused on bringing a halt to the upward spiral of the nuclear arms race, stability and flexibility became important issues for the strategic triad. The bomber provided these capabilities far beyond that which the ballistic missile legs could provide.

> In the nuclear arena, the bomber enhances the stability of the nuclear balance. Its high survivability promises any aggressor that an attack will be met with devastating retaliation, while its relatively slow speed compared to ballistic missiles means that the bomber does not pose a first-strike threat. Because it can be generated, dispersed, launched under positive control and then recalled or redirected, the bomber also provides our nation's leaders with a highly flexible means of sending a variety of unmistakable messages to an adversary—messages that can help defuse and stabilize crises.[33]

While some politicians argued for a purely cruise missile force to save the cost of providing defensive upgrades to the B-1B and procuring the B-2, the Air Force used the continued buildup of Soviet defenses to discredit this concept.

> Moving to a pure missile force would eliminate the advantages provided by penetrating bombers and introduce new vulnerabilities. Using long-range radars, airborne radar platforms, tankers, and fighters, Soviet air defenses could focus on detecting, tracking, and engaging nonstealthy cruise missile carriers before they could launch their missiles.[34]

The Air Force continued to advocate a balanced mix of penetrating bombers and cruise missile carriers to provide flexibility and complicate the Soviet defensive effort.

> Cruise missiles have proven to be a valuable compliment to the penetrating bomber force: they extend the lives of older bombers no longer capable of penetrating effectively, add mass to the bomber attack by saturating defenses, and are excellent weapons against fixed targets. The manned penetrating bomber is an extremely efficient, flexible, and effective system. The key to the penetrating bomber's warfighting versatility and efficient weapons delivery is the presence of a crew in the cockpit capable of reacting to situations and making decisions.[35]

The collapse of the Soviet Union called into question the validity of these arguments. In the face of intense congressional debate over the B-2, the Air Force drew attention to the fact that bombers are reusable platforms that also can perform conventional missions. This campaign was met with increased public criticism that the Air Force was trying hard to justify the B-2 by inventing a new mission for it.[36] The capping of the B-2 purchase at 20 and the ACM buy at 640 and the cancellation of the SRAM II program made it obvious that with the decreased Soviet threat the Department of Defense (DOD) could not provide adequate support for continued capital investment in heavy bombers for nuclear deterrence.

Intercontinental Ballistic Missiles

The intercontinental ballistic missile (ICBM) leg has always been touted as the most economical leg of the triad.

> ICBMs make unique contributions to the TRIAD. They are valued for their promptness, reliability, accuracy, low operating cost, connectivity, and availability—while their near 100% alert rate allows the other two legs of the TRIAD to operate at more economical tempos.[37]

There are two problems with the ICBM fleet: age and survivability. Retiring Minuteman (MM) II missiles in conjunction with arms reductions was a cost-effective approach to the aging problem. Minuteman IIIs are facing an aging problem as well. In response to the president's cancellation of the small ICBM (SICBM), Dick Cheney stated that it "will require us to take steps to maintain the Minuteman III force. Eventually those missiles will have to be refueled; they'll need new guidance systems."[38]

Current plans include "replacement of aging components in the guidance computer and associated electrical systems and refurbishment of the second- and third-stage rocket motors." Replacement of the guidance system and refurbishment of the first-stage motor also are being considered. The goal is to extend the life of the Minuteman III fleet beyond the year 2010.[39]

The SICBM and the Peacekeeper rail garrison (PKRG) were proposed solutions to the survivability problem.

> Soviet advancements in ICBM accuracy and increased MIRVing led to increasing concern over the survivability of our silo-based ICBM force and the potential for crisis instability. Adding mobility was deemed to be the best method of addressing these problems, which in turn led to the development of the Peacekeeper Rail Garrison program, where Peacekeeper missiles would be mounted on trains, and the Small ICBM (SICBM) program, where single warhead missiles would be mounted on Hard Mobile Launchers (HMLs).[40]

In the face of a reduced Soviet threat and leaner defense budgets, President Bush canceled both SICBM and PKRG programs as part of his unilateral initiatives. He made this decision without seeking equal concessions from the Soviets. The START I agreement allows each side to deploy up to 1,100 mobile land-based warheads. The START II treaty bans MIRVed ICBMs and places no further limits on mobile systems. Thus, the Russians will retain an advantage with survivable mobile ICBMs, while the United States will be left with 500 silo-based missiles.

Submarine-Launched Ballistic Missiles

The nuclear-powered fleet ballistic-missile submarine (SSBN), part of "the Silent Service," has provided an extremely survivable strategic deterrent for more than 30 years. Operating on nuclear power, it can patrol independently underwater for months at a time, limited only by the need for food replenishment and crew rest. Unlike the silo-based ICBM, the submarine-launched ballistic missile (SLBM) is survivable; that is, it does not need to be launched upon warning of incoming ballistic warheads. Therefore, it also provides a survivable strategic reserve force.

The SLBM has historically been inferior to the ICBM on three counts: less certain communication links with the national command authorities (NCA), a more limited missile range, and less accuracy, which translates to a lack of hard-target-kill capability. The advent of the Trident submarine with the Trident II missile system and the D-5 warhead has eliminated the latter two arguments. More survivable communication links also have been part of modernization programs.

An aging fleet and cost considerations have forced the retirement of the older Poseidon submarines, curtailed the

Trident buy to 18, and postponed indefinitely the Trident II missile upgrade for the Pacific-based boats. The closure of Rocky Flats initially was responsible for limiting the number of D-5 warheads to a few hundred. President Bush's announced cancellation of further D-5 production made the situation permanent.

The Soviets traditionally have feared the SSBN as a formidable threat, whereas the United States has been concerned about the SS-18. During his State of the Union Address in January 1992, President Bush proposed to lower the number of SLBM warheads by about one-third in exchange for a ban on MIRVed ICBMs. The United States and Russia reached a compromise in the Washington Summit, where each side decided to eliminate MIRVed ICBMs by the year 2003 in exchange for a lowering of the number of SLBM warheads by approximately one-half.

The Future of the Triad

In response to the changes announced by President Bush in his 1992 State of the Union Address, Secretary of Defense Cheney stated that the United States "will continue to rely on its strategic nuclear deterrent capability," which will be "a modified version of the traditional Triad" and will give "less emphasis to land-based ICBMs and ready bombers."[41]

Referring to the possibility of facing weapons of mass destruction in future conflicts, Cheney stated:

> We may need to fight earlier than we had to this time. If the use of weapons of mass destruction is threatened, we may need to win even more quickly and decisively, and we would want to retain the advantages necessary to keep our own losses as low as possible.[42]

He mentioned the development of new systems and the importance of maintaining the capability to preempt if necessary.

> We may require advanced systems to deal with the proliferation of weapons of mass destruction, either to destroy them before they are used, to defend against them, or to win decisively to discourage others from contemplating their use.[43]

While the president, secretary of defense, and chairman of the JCS have discussed their plans for nuclear weapons and

forces for the next decade in a fair amount of detail, they have not been as forthcoming with changes to nuclear strategy for the post-cold war era. As discussed in the introduction, nuclear policy consists of several parts. These parts—arms control, acquisition, and deployment policy—have been well publicized throughout the Reagan and Bush administrations. While US defense strategy has shifted to regional threats and collective security, nuclear declaratory policy has not been altered significantly since the announcement of NATO's flexible response strategy and Carter's countervailing strategy. While the details of current employment policy are classified, Secretary of Defense Cheney stated, "US nuclear targeting policy and plans have changed and will continue to change in response to developments in the former Soviet Union."[44]

The post-cold war era has brought with it a flurry of opinions on the future role of nuclear weapons and what is necessary for continued deterrence. The next chapter examines the scope of public opinion, which is a significant force acting on public officials and a potential major player in determining future nuclear requirements.

Notes

1. Just prior to leaving office, President Bush released the 1993 national security strategy. This new document was significantly shorter than its 1991 predecessor and did not make any declared changes to US nuclear policy. Thus, I chose to use the more detailed information available in the 1991 version.
2. President George Bush, *National Security Strategy of the United States* (Washington, D.C.: The White House, August 1991), 3–4.
3. Ibid., 25.
4. Ibid.
5. Dick Cheney, *Report of the Secretary of Defense to the President and Congress* (Washington, D.C.: Government Printing Office, 1993), 69.
6. Ibid., 15–16.
7. 1991 *National Security Strategy*, 26.
8. The 1993 version of the *National Security Strategy* did not discuss nonstrategic nuclear forces. Chapter 5 discusses possible reasons for and ramifications of this omission.
9. 1991 *National Security Strategy*, 26.
10. Ibid.
11. Ibid., 27.
12. Ibid., 15.
13. *Report of the Secretary of Defense*, 72.
14. 1991 *National Security Strategy*, 27.

15. Ibid., 14.

16. President George Bush, *National Security Strategy of the United States* (Washington, D.C.: The White House, January 1993), 17.

17. Based on a statement released by the US Arms Control and Disarmament Agency (ACDA), Washington, D.C., 5 January 1993, in *U.S. Department of State Dispatch* 4, no. 3 (18 January 1993): 27.

18. The 1993 version of the *National Security Strategy* uses the term "limit" as opposed to "stop" (proliferation). The significance and possible ramifications of this change are discussed in chapter 5.

19. 1991 *National Security Strategy*, 15.

20. "Nonproliferation Initiative," US Arms Control and Disarmament Agency, Washington, D.C., Office of Public Affairs, 13 July 1992, 1.

21. Ibid., 3; "Existing Nonproliferation Efforts," US Arms Control and Disarmament Agency, Washington, D.C., Office of Public Affairs, 13 July 1992, 1–2.

22. 1991 *National Security Strategy*, 30.

23. Joint Chiefs of Staff, *The National Military Strategy of the United States* (Washington, D.C.: Government Printing Office, 1992), 1; [preface], np.

24. Ibid., 13.

25. Ibid., 6.

26. Ibid., 12.

27. Ibid., 13.

28. Ibid., 18.

29. House of Representatives, *Department of Defense Appropriations for Fiscal Year 1992: Hearings before the Subcommittee of the Committee on Appropriations*, 102d Cong., 1st sess., 1991, pt. 8:15–16.

30. *Report of the Secretary of Defense*, 70.

31. Senate, *Department of Defense Authorization for Appropriations for Fiscal Year 1991: Hearings before the Subcommittee of the Committee on Appropriations*, 101st Cong., 2d sess., 1990, pt. 2:327.

32. Donald B. Rice and Merrill A. McPeak, "FY92 Air Force Posture Statement" presented to the House of Representatives Armed Services Committee, 26 February 1991, in *Air Force Update*, Secretary of the Air Force, Office of Public Affairs, 26 February 1991, 4.

33. Ibid., 5.

34. Ibid., 5–6.

35. Ibid., 5.

36. See Senate, *Department of Defense Appropriations for Fiscal Year 1992: Hearings before the Subcommittee of the Committee on Appropriations*, 102d Cong., 1st sess., 7 May 1991, pt. 3:965–99 and 5:440–64. Many of the questions directed to General Butler concern this issue and, in particular, the submitted questions.

37. "FY92 Air Force Posture Statement," 6.

38. News briefing and question and answer session with Secretary of Defense Dick Cheney, Chairman of the Joint Chiefs of Staff Gen Colin Powell, and Deputy Secretary of Defense Donald Atwood, Pentagon, 31 January 1992, in *Defense Issues* 7, 31 January 1992, no. 3, 3.

39. *Report of the Secretary of Defense*, 70.

40. "FY92 Air Force Posture Statement," 7.

41. Prepared statement of the Secretary of Defense Dick Cheney to the Senate Armed Services Committee, 31 January 1992, in *Defense Issues* 7, 31 January 1992, no. 4, 11.
42. Ibid., 14.
43. Ibid., 15.
44. *Report of the Secretary of Defense*, 4.

Chapter 3

Current Thinking on the Future Role of Nuclear Weapons

The post–cold war era provides a unique opportunity for accomplishing national security objectives with a smaller defense force. The question that politicians and analysts are grappling with is, To what level can the United States disarm while maintaining a high degree of confidence in being able to achieve national security objectives? The literature is full of opinions on the matter. While a complete review of the literature is not practical, this chapter captures a sampling of the broad spectrum of varying opinions regarding the requirements for US nuclear forces. Although many of these opinions are not necessarily those held by current policymakers, public opinion and media coverage have a tremendous leverage in influencing policy decisions. An opinion advocated in print today may turn into national policy tomorrow. Future nuclear policy could be a conglomerate of many of the opinions cited in this chapter.

An Assessment of Current Thinking

This chapter proposes a series of seven questions, the answers to which will determine the future objective of US nuclear forces, the numbers of weapons needed, and how they should be postured. Public opinions from the literature are presented as answers to these questions, providing a systematic method for analyzing the various proposals.

Seven Questions regarding Future US Nuclear Forces

First, are US nuclear weapons necessary to achieve national security objectives in the post–cold war era? Second, (if so) is the sole purpose of nuclear weapons to deter the use of another country's nuclear weapons, or should nuclear weapons also

have a role in deterring the use of chemical and biological weapons and conventional attack (as in the NATO flexible response strategy)? Third, should the United States continue to extend the umbrella of deterrence to allies, or should US nuclear weapons serve solely to deter against attack on the United States? Fourth, are tactical nuclear weapons necessary for deterrence, or can strategic nuclear weapons accomplish national security objectives? Fifth, what nuclear strategy will best accomplish national security objectives? Sixth, how many and what types of nuclear weapons does the United States need to implement its nuclear strategy? Seventh, how should the United States posture its nuclear forces to best achieve national security objectives?

Terms

In examining a variety of documents, articles, and books dealing with this subject, this writer found that some common terms taken for granted as having a universally understood meaning actually mean different things to different authors. These terms include *nuclear deterrence, extended deterrence,* and *nuclear weapons reductions.*

The term nuclear deterrence is used universally; it is often shortened to *deterrence.* During the cold war the term was used only in conjunction with the Soviet Union. In the wake of the Gulf War, a series of articles dealing with the threat of weapons of mass destruction, in particular from third world countries, have used the term almost entirely in the multipolar (as opposed to the bipolar) sense. While in the past, nuclear deterrence has predominately implied the use of nuclear weapons to deter someone else from using nuclear weapons, such a narrow definition no longer suffices.

When one speaks of nuclear deterrence, does one refer to the defender or the attacker? Is the defender using nuclear weapons to deter nuclear attack (and perhaps chemical, biological, and conventional attack as well)? Or is the defender using nuclear weapons (and possibly such conventional weapons as precision-guided munitions and GPALs) to deter a potential attacker from using nuclear weapons? Until a new set of definitions appears, authors should state which types of weapons are being used to deter which types of attack.

Authors traditionally have used the term *extended deterrence* to speak of the use of US nuclear weapons to deter nuclear attack on US allies. The term has been broadened in recent years to include using US nuclear weapons to deter conventional attack on US allies. The NATO flexible response strategy offers a case in point. Other authors have used *extended deterrence* to include the use of nuclear weapons to deter all weapons of mass destruction. As with nuclear deterrence, writers should specify what type of deterrence a country is extending, and to whom.

Many writers fail to distinguish between strategic and tactical nuclear weapons. Their articles advocate a certain level of nuclear reductions but fail to state whether they are dealing with strategic nuclear weapons, tactical nuclear weapons, or both. For example, a conclusion to an article that advocated a reduction below START levels might read, "And thus we can safely reduce our total nuclear weapons to a level of no more than 3,000 warheads." Never having mentioned tactical weapons in the article, the author might mean only strategic warheads or, literally, all nuclear warheads.

Additionally, in dealing with nuclear reductions, the vast majority of authors show either ignorance or total disregard for maintenance, repair, and testing. Writers frequently use the term *total* to describe the resulting numbers of warheads after applying proposed reductions. Almost always, the author is really advocating total operational warheads. Authors rarely mention that an additional percentage must be added to operational warheads to account for maintenance, repair, and testing. Depending on the particular system, this percentage may be as much as 20 percent above the "total" number.

Are Nuclear Weapons Still Necessary?

Are US nuclear weapons necessary to achieve national security objectives in the post–cold war era? Although antinuclear protests occurred during the cold war, Americans for the most part seemed to have accepted nuclear weapons as a fact of life. Now that the Soviet threat has greatly diminished, has the American perspective changed?

Nuclear Weapons Should Be Eliminated

Some writers suggest that the post–cold war era will produce a change in societal attitudes regarding the need for nuclear weapons. Paul Warnke (former director of the Arms Control and Disarmament Agency) states, "In 1992, it is hard to imagine that the United States or its friends in Europe or elsewhere could be the victims of nuclear or even large-scaled conventional aggression."[1] This mentality has prevailed after every major conflict in which the United States has participated, leading to severe reductions in the size of US armed forces in each instance.

William Arkin (director of nuclear information, Greenpeace USA), Damian Durrant (research associate, Greenpeace USA), and Hans Kristensen (research associate, Greenpeace International) state that "undoubtedly society will go through a period in which 'minimum' deterrence is important, but once nuclear weapons have relinquished their dominant position, the continued investment in them will be questioned."[2]

David Yost (associate professor, Department of National Security Affairs, US Naval Postgraduate School, Monterey, California) claims that nuclear deterrence is being delegitimized.

> This delegitimization might be defined as (at least in some circles) reduced confidence in the reality and safety of nuclear deterrence arrangements and lessened certainty about the practical prudence, strategic necessity, and/or moral legitimacy of posing nuclear threats to adversaries.[3]

He claims that these changes are not found "in the views of the masses [but] . . . have instead been in the views articulated in certain elite sectors of society." He also indicates that it would be difficult to measure such changes, but a trend in which public opinion is having more inroads into higher-level policy-making seems to be forming.[4]

Kosta Tsipis (physics professor at Massachusetts Institute of Technology and director of MIT's program in science and technology for international security) sees a possible evolution away from dependence on nuclear weapons.

> Nuclear deterrence will become decreasingly relevant while a new set of self-interests will impose self-discipline on the political leadership of each nation. The United States and the Soviet Union may forego war in the future, not just because nuclear deterrence will prevent them, but

> probably because economic or common geopolitical interests will make war irrelevant.[5]

He cites the relationship between the United States and Great Britain as an example.

Those who advocate the elimination of nuclear weapons espouse one or more of four basic arguments. First, they stress that the use or threatened use of nuclear weapons against civilians is morally wrong. Second, they argue that since military bases and industrial complexes are often collocated with civilian population centers, these targets cannot be attacked without a tremendous loss of civilian life. Third, they say that nuclear war cannot be controlled and that it will inevitably end in massive carnage, possibly world destruction. Fourth, now that the cold war is over, they argue that nuclear weapons serve no useful purpose and should be eliminated totally.

Those who favor the elimination of nuclear weapons almost unanimously call for an immediate ban on nuclear weapon testing, discontinuance of nuclear weapon fuel production, and cessation of nuclear weapons development. The major difference of opinion among those who call for the elimination of nuclear weapons centers around how quickly total elimination is possible.

Those who favor quick action cite two predominant reasons. First, the present situation in which the Russians are on amiable terms with the West may be a unique, short-lived situation. The political climate within the CIS could change at any moment and revert to hard-line communism. Thus, the chance to eliminate nuclear weapons should be seized quickly. Second, they assert that quick elimination of nuclear weapons would reduce pressure on third world countries to acquire nuclear weapons for themselves. This includes both indigenous production and the potential to purchase loose nukes from the CIS republics.

Other observers are more cautious, preferring a gradual reduction over time while maintaining a deterrent posture to discourage nuclear attack. These individuals favor the continuance of such confidence-building measures as taking some or all ICBMs, SSBNs, and bombers off alert status and removing and then storing their warheads.[6] Such action would

be a sign of good faith that the United States is indeed serious in moving toward the goal of eliminating nuclear weapons.

Other confidence-building measures include verifiable step reductions. Mikhail Gorbachev's three-stage plan to eliminate nuclear weapons by the year 2000 was one of the first such proposals.[7] Randall Forsberg (director of the Institute for Defense and Disarmament Studies in Cambridge, Massachusetts) also advocates the elimination of nuclear weapons in a three-step sequence but over a five- to 10-year period. Step one involves a multilateral reduction to approximately 1,000 nuclear weapons. Step two stipulates a reduction to approximately 100 warheads. And step 3 provides for the total elimination of all nuclear weapons.[8]

Two major obstacles exist to achieving a nuclear-free world. The first is achieving world consensus on the total elimination of nuclear weapons. The second is implementing a verification plan to ensure that no cheating occurs. The eliminators believe there is already overwhelming support for a nuclear-free world. Proposals for verification range from intrusive verification[9] to self-policing by members of each nation.[10] Richard Barnet (a fellow at the Institute for Policy Studies and one who also served in the US Arms Control and Disarmament Agency) suggested that verification costs could be shared mutually by a worldwide tax scheme.[11] Theodore Taylor (former weapons designer at Los Alamos National Laboratory, former member of the Defense Nuclear Agency, and currently president of Southern Tier Environmental Protection Society in New York State) views verification as an international effort that encourages "whistleblowers" and "severely and directly punishes violators."[12] Paul Nitze (founder and diplomat-in-residence at the Paul H. Nitze School of Advanced International Studies at the Johns Hopkins University and adviser on arms control issues to every president since Harry S Truman) provides an interesting insight to the verification problem.

> The global elimination of nuclear weapons, if this were ever to become possible, would need to be accompanied by widespread deployments of effective nonnuclear defenses. These defenses would provide assurance that were some country to cheat . . . it would not be able to achieve an exploitable military advantage.[13]

Idealistically speaking, perhaps it would be possible to eliminate nuclear weapons, police against cheating, and maintain GPALS just in case a missile gets by the verification regime. But most observers are not so optimistic.

Nuclear Weapons Should Not Be Eliminated

While many authors agree that nuclear weapons will play a less prominent role in the post–cold war era, they do not agree that the logical end is total elimination. Patrick Garrity (staff member for National Security Studies at Los Alamos National Laboratory and former member of the Center for Strategic and International Studies and professor at the Naval Postgraduate School) writes that "nuclear weapons are depreciating in their value as a currency in international relations, at least in terms of relations among today's major powers."[14] Unlike Tsipis, however, he does not see elimination as the logical conclusion to depreciation.

> The nuclear depreciation will manifest itself in certain obvious ways, such as a substantial reduction in the size of American and Soviet stockpiles . . . and significantly decreased rates of nuclear modernization . . . issues associated with these weapons will no longer dominate the political and military agendas of the great powers . . . rather, they will be interested in using nuclear weapons as a hedge in the event that international relations should deteriorate and as a means of keeping the major power competitions at the political and economic, not the military, level.[15]

By deemphasizing nuclear weapons and focusing future military forces around high-technology conventional weapons, Garrity cautioned that an adversary may find employment of nuclear weapons an effective strategy. He also voiced a concern that technological breakthroughs coupled with nuclear reductions could greatly upset the balance of power and quickly bring nuclear weapons back into focus.[16]

Those who see a continuing role for nuclear weapons share a common view that nuclear weapon technology cannot be disinvented and that nuclear weapons cannot be successfully eliminated, if for no other reason than complete worldwide verification is impossible. Rather than reducing the temptation for third world countries to acquire nuclear weapons, a ban on nuclear weapons may increase it. A few nuclear weapons in

the hands of a single country could provide tremendous leverage, as demonstrated by the United States at the end of World War II. Thus, the risks of cheating would outweigh the disadvantages of getting caught in a nuclear-free world. Referring to work performed back in 1963 under the Kennedy administration, Paul Nitze states:

> We prepared a Paper [sic] on the issues involved in a bilateral agreement limiting strategic nuclear delivery vehicles between the United States and the Soviet Union. The analysis suggested that the total elimination of nuclear weapons was not the optimum solution. This was because nuclear technology had become too widely known; the risk of clandestine or third-country production of nuclear weapons was too great. It seemed that a level of perhaps 500 strategic nuclear weapons on each side would provide a more stable and predictable future than none at all.[17]

If the concern for technology proliferation was great in 1963, it is much more so today.

Advocates for the elimination of nuclear weapons that raise the morality issue seem predominately concerned with the targeting of, or the collateral damage to, civilian populations. But such has been the concern of many individuals since the advent of total wars. More than one and one-half million German and Japanese civilian casualties were inflicted by conventional bombing in WWII.[18] Modern wars require tremendous logistics supplies. As such, support personnel and civilians that comprise the logistics train from factory to the battlefield are key targets. The issue of morality is truly one of war and not just atomic weapons.

Most Americans probably will agree that nuclear weapons are necessary to deter nuclear attack against the United States, at least for the foreseeable future. Advocates for the continued use of nuclear weapons disagree with one another in at least three areas. First, they disagree over whether nuclear weapons also should be used to deter chemical, biological, and conventional attack. Second, while some advocates see tactical nuclear weapons as having a continuing role in the post–cold war era, others believe that they no longer serve any useful purpose. Third, there is a lack of consensus over whether the nuclear umbrella should be extended to US allies and, if so, what guarantees the United States should offer. The next three sections examine each of these areas.

Chemical/Biological Weapons and Conventional Attack

Is the sole purpose of nuclear weapons to deter the use of another country's nuclear weapons, or should nuclear weapons also have a role in deterring the use of chemical and biological weapons and conventional attack (as in the NATO flexible response strategy)?

Arguments against Nuclear Use in These Roles

Carl Kaysen and George W. Rathjens (both members of the Defense and Arms Control Program at MIT) and Robert S. McNamara (US Secretary of Defense from 1961 to 1968) suggest that nuclear weapons are "useful in the narrowest deterrent role: to make sure that no other nuclear weapons state is tempted to attack."[19] Similarly, a National Academy of Sciences Committee on International Security and Arms Control (CISAC) report concluded that

> The principal objective of U.S. nuclear policy should be to strengthen the emerging political consensus that nuclear weapons should serve no purpose beyond the deterrence of, and possible response to, nuclear attack.[20]

Paul Nitze, who also holds this view, argues,

> The United States cannot rely on its nuclear weapons to deter attacks with chemical, biological, or conventional weapons. . . . The prospect that a nuclear weapon would be used in response to such attacks is too dubious for deterrence to be reliable.[21]

Using nuclear weapons to deter chemical, biological, or conventional attack implies at least a threatened nuclear "first-use" policy. Reviewing several polls, David Yost states that "there has been little public support for 'first-use' nuclear employment concepts in the United States or Western Europe since the mid-1950s." Citing a poll by Thomas Graham, Yost states that 60 to 69 percent of Americans favor second-use of nuclear weapons only in the instance of an attack on the US homeland or on US troops abroad.[22]

During Desert Shield, James Kitfield noted that "some defense experts are even suggesting that the United States apply the 'flexible response' doctrine of NATO to its showdown

with Iraq. That could mean countering any chemical weapon attack with tactical nuclear weapons."[23] President Bush did publicly threaten Iraq with the "strongest possible response" should Saddam unleash chemical or biological weapons. The national command authorities were ambiguous about the use of nuclear weapons, however, indicating that it was their desire "to keep Saddam guessing," (according to an unnamed administration official in a 4 February 1991 *Time* article). The president confirmed this ambiguity at a televised news conference on 5 February 1991 when he was asked about possible US responses to a chemical attack. He stated, "I think it is better never to say what you may be considering."[24] Other administration sources stated, "It's very unlikely that the United States would even respond in kind to a chemical attack."[25] The *Time* article also suggested that the United States never really had any other intention but a conventional response for two key reasons:

> [One] The linchpin in Washington's strategy to limit the spread of atomic weapons is a formal promise never to use them against a nonnuclear-armed state. If the U.S. violates its own policy to nuke Iraq, which by all indications does not yet have the bomb, other countries might rush to develop atomic arms and possibly use them. . . . [Two] Advanced nonnuclear weapons such as fuel-air bombs and cluster bombs can do virtually as much damage to battlefield targets as nukes would.[26]

McGeorge Bundy (chairman of the Carnegie Corporation's Task Force on the Nuclear Threat and former special assistant for national security affairs to President Kennedy) criticized President Bush for using Desert Shield to reinforce publicly the US policy of nonuse of nuclear weapons against nonnuclear states announced by Secretary of State Cyrus Vance under Carter in 1978:

> President Bush missed an excellent opportunity to make clear that in reality, and as a matter of basic national policy, the United States would not be the first to use nuclear weapons in this crisis. . . . He would have greatly strengthened the worldwide cause of avoiding nuclear war and won honor for leadership around the world—especially at home.[27]

Now that the massive Eastern bloc conventional threat to Western Europe is basically gone, is the concept of deterring conventional attack with nuclear weapons still valid today?

Some analysts continue to say yes, but a larger and more vocal majority is saying no. *Newsweek* conducted a poll during Desert Storm that asked, "Do you favor or oppose the use of tactical nuclear weapons against Iraq to quickly end any hostilities and save the lives of U.S. forces?" An overwhelming 72 percent of those responding said they opposed such action.[28]

Several authors cite the significant number of conventional conflicts that occurred during the cold war as proof that nuclear weapons cannot deter conventional conflict. Joseph Rotblat (president of the Pugwash Conferences on Science and World Affairs, London, England) states that "nuclear weapons have certainly not prevented the outbreak of some 125 wars since 1945, some directly involving the superpowers, which have led to an estimated 40 million deaths."[29]

While the United States has maintained a general policy of nuclear response in the face of such overwhelming conventional opposition as an overrun of NATO forces in Western Europe by the Soviet and Warsaw Pact forces, many Americans never have been comfortable with this position. Yet even in the context of Western Europe, once the nuclear threshold has been breached, there would be no guarantee of stopping the conflict short of an escalation to all-out nuclear war. Many authors have argued that using nuclear weapons to thwart a conventional attack was an idle threat. They contend that the United States would never risk the retaliation of Soviet ICBMs on American cities for the sake of Western Europe or American lives on foreign soil. The French initiated their own nuclear program because of this very logic. In the aftermath of Desert Storm, many observers believe that high-tech conventional weapons can perform the same mission as nuclear weapons without the stigma of crossing the nuclear threshold.

Arguments for Deterring Chemical and Biological Attack

Deterrence of chemical and biological weapons poses a real problem for the United States. With the signing of the Chemical Weapons Convention, the United States now has a "no use" policy for both biological and chemical weapons.

Thus, conventional and nuclear responses are the only possible retaliatory options to a chemical or biological attack.

Gen Colin Powell (chairman, JCS) specifically defined the role of nuclear weapons as deterring weapons of mass destruction in the national military strategy. Although President Bush never publicly threatened the use of nuclear weapons in Desert Storm, the implication was there. While a blanket US policy of nuclear response to a chemical or biological attack could undermine the policy of nuclear nonuse against nonnuclear countries and could also give the third world a clear signal of the importance of obtaining nuclear weapons, a blanket policy of no nuclear use could open the door for chemical and biological use against the United States or its allies.

Arguments for Deterring Conventional Attack

The *National Security Strategy* states that two of the purposes of nonstrategic nuclear forces are to "contribute to the deterrence of conventional attack" and "link conventional defense to the broader strategic nuclear guarantee."[30] The argument that nuclear weapons have not prevented conventional wars is a hollow one. Some analysts would argue that the presence of a strong US nuclear posture is what prevented Soviet nuclear use, prevented an Eastern bloc overrun of Western Europe, and mitigated the effects of third world regional conflicts. Some historians credit Eisenhower's threatened use of nuclear weapons as a key ingredient to the final Korean armistice.

It is impossible to assess what would have happened over the past 47 years without nuclear weapons. An estimated 55 million people died in WWII.[31] Forty million deaths in conventional conflicts over the past 47 years certainly is better than 55 million deaths in six years. The presence of nuclear weapons may have prevented many more deaths than would have occurred in their absence. Richard Barnet states:

> As a practical matter, a nuclear weapons-free environment is probably unattainable and certainly would not be stable in a world ruled by force and bulging with conventional weapons.[32]

In fact, some individuals advocating elimination of nuclear weapons realize this fact and are calling for the disarmament of all conventional armies down to defensive-sized, police-keeping forces.[33]

NATO has never declared a "no first-use policy" but has declared a "no first-use of violence" to prevent the Soviet Union from thinking it could launch a conventional attack on Western Europe "without risking nuclear retaliation."[34] In light of the changes in Eastern Europe, would it be appropriate to announce a "no first-use policy"? Until the recent changes in Europe, most NATO members thought that such a decision would provide an open invitation for a Soviet conventional invasion of Western Europe. Walter Slocombe (member of Caplin and Drysdale law firm in Washington, D.C.) says that "hedging against the possibility of a Soviet relapse will be a priority for US and European security policy for many years to come."[35] President Bush's tactical nuclear weapon initiatives left an air-delivered capability in Europe as just such a hedge.

Extended Deterrence

Should the United States continue to extend the umbrella of deterrence to allies, or should US nuclear weapons serve solely to deter attacks on the United States? Paul Nitze states that "U.S. nuclear weapons may continue to play a role in reassuring friends and allies, underscoring the U.S. commitment to their security."[36] He goes on to say that the continuing role of extended deterrence depends on changes in the security environment.

Many critics feel that extended deterrence is a hollow threat—that the United States would not risk an attack on its homeland to retaliate against a nuclear attack on one of its allies. What then is the purpose of alliances? If the national command authorities elect not to respond in such a case, they must be prepared to bear the brunt of some potentially severe ramifications. Certainly, it would call the US nuclear umbrella into serious question and signal nonnuclear alliance countries to go out and procure their own nuclear weapons for self-preservation. Such nonaction would strike at the very

heart of US nonproliferation policies. Even more unsettling, however, would be the perceived message by third world aggressors—a nuclear weapon can be detonated against a US ally without eliciting a nuclear response.

The issue of US nuclear response to chemical, biological, and conventional attack on one or more of its allies is at best gray. The United States has neither rescinded support of the NATO flexible response doctrine nor abrogated its nonuse against nonnuclear states. Keeping nuclear response options would provide US national command authorities the greatest amount of flexibility in dealing with future scenarios.

Tactical Nuclear Weapons

Are tactical nuclear weapons necessary for deterrence, or are strategic nuclear weapons sufficient to accomplish national security objectives? Tactical nuclear weapons coupled with highly accurate strategic weapons have provided the capability to employ nuclear weapons across the full spectrum of conflicts. The NATO flexible response strategy reflected US willingness to employ nuclear weapons in such a manner. President Bush's unilateral initiative announced on 27 September 1991 places almost all tactical nuclear weapons in CONUS storage facilities and requires the destruction of many of them.

Some nuclear arms control analysts have advocated the elimination of the artificial distinction between strategic and tactical nuclear weapons. While some individuals think of higher yield nuclear weapons as being strategic and lower yield ones as being tactical, traditionally a nuclear weapon has been termed strategic or tactical by its delivery platform and method of employment. DOD has defined strategic nuclear weapons as those deployed on delivery platforms that have intercontinental ranges—ICBMs, SLBMs, and long-range bombers. Tactical nuclear weapons are employed in a battlefield scenario.

Cruise missiles posed a problem for the START negotiators—are they strategic or tactical? Analysts employed an artificial range definition to solve the problem. They deemed those

missiles with ranges greater than 600 kilometers strategic and countable under START, except for submarine-launched cruise missiles (SLCMs), which were discussed in a side agreement. The Intermediate-Range Nuclear Forces (INF) Treaty solved some of the problems of intermediate-range nuclear forces by requiring their destruction. Perhaps one day the distinction between strategic and tactical nuclear weapons will vanish. For now, however, most analysts still recognize a difference.

Eliminate Tactical Nuclear Weapons

Advocates for the elimination of tactical nuclear weapons see the maintenance of these systems as contributing to heightened tensions between two states in a time of crisis. That tactical nuclear weapons were added to the US arsenal to bolster conventional defenses and that many tactical nuclear weapons have relatively low yields increases the believability of a nuclear response. Sergei Kortunov (an associate of the Arms Limitation and Disarmament Directorate, ministry of foreign affairs of the Soviet Union, under President Gorbachev) advocates a mutual deterrence posture that is "maintained exclusively by strategic forces at minimum possible levels while all nonstrategic nuclear weapons should be eliminated."[37]

Other observers advocate the elimination of tactical nuclear weapons based on their obsolescence. These individuals assert that not only can precision, high-technology conventional weapons accomplish the same mission as tactical nuclear weapons but that they are a better deterrent to war because conventional response is more believable. Beatrice Heuser (a lecturer in the Department of War Studies at Kings College, University of London) states that the employment of tactical nuclear weapons is "currently being thrown into doubt by the advent of new conventional weapons with capabilities approaching those of nuclear arms." The advent of fuel-air explosives, conventional high explosives, precision-guided, earth-penetrating weapons, and conventional cruise missiles are negating the need for nuclear weapons.[38] Patrick Garrity and Sharon Weiner (a doctoral candidate in political science at MIT) suggest:

> The clear U.S. conventional superiority as manifested in the Persian Gulf War would seem to render moot the principal long-standing military justification for nuclear weapons—that they were needed to compensate for presumed Western conventional inferiority.[39]

Maintain Tactical Nuclear Weapons

Removing nuclear weapons from Europe would reduce the deterrence threshold, since the penalty for aggression would not be so grave: aggressors might be willing to accept the same potential military losses if they were not accompanied by the side effects of nuclear weapons. During Mikhail Gorbachev's visit to England in April 1989, Margaret Thatcher stated that "both of our countries know from bitter experience that conventional weapons do not deter war in Europe, whereas nuclear weapons have done so for over forty years."[40]

Although the tremendous changes in Europe merit the removal of tactical nuclear weapons, announcing the destruction of a significant number of tactical nuclear weapons sends quite a different signal to the world. While President Bush indicated a small air-dropped capability would be retained, the overwhelming perception among other nations may well be that the United States is not planning to use nuclear weapons in any future conventional scenario.

If an aggressor perceives that the United States no longer has the will to use nuclear weapons, the deterrent value of those weapons becomes null and void. As mentioned in the previous section, the United States added tactical nuclear weapons to its arsenal to increase the believability of a nuclear response. The concept of believability has been described as the "usability paradox":

> For the sake of deterrence, nuclear forces must be "usable enough" to convince the Soviet Union that a potent U.S. nuclear response would actually be forthcoming in the event of a Soviet attack on the United States or its vital interests. To prevent accidental war, however, U.S. weapons must not be "so usable" that they are ever launched through a mechanical error, used by unauthorized or insane military commanders, or operated in such a provocative manner as to cause the Soviet Union to mistakenly "preempt" what it falsely believes is an imminent U.S. attack.[41]

Thomas W. Dowler and Joseph S. Howard II of Los Alamos National Laboratory identify two potential problem scenarios

that US armed forces may face in future regional conflicts—US contingency forces could be overrun by stronger conventional forces and/or may be exposed to the use of nuclear, biological, and chemical weapons. They also assert that US national leadership will probably not respond to these scenarios with nuclear weapons because US nuclear weapons have large yields that will "self-deter" policymakers from using them in regional conflicts.[42]

These authors' principal thesis is that low-yield nuclear weapons "could enhance U.S. security in possible future third world conflicts by bridging the gap that exists between the capabilities of conventional weapons . . . and the higher yield nuclear weapons that dominate our current arsenal." They assert that the mere existence of low-yield nuclear weapons coupled with the resolve to use them may provide a viable deterrent to a tyrant who doesn't believe US leadership would actually use the current stockpile.[43]

Dowler and Howard propose three categories of small-yield nuclear weapons, each with a different purpose, to bridge the gap between current conventional capabilities and the nuclear arsenal: (1) "micronuke[s] with a yield on the order of 10 tons," which could be employed against command and control and airfield facilities; (2) "mininuke[s] with a yield of about 100 tons," which could be utilized in a ballistic missile defense role, particularly against ballistic missiles carrying nuclear, biological, or chemical weapons; and (3) "tinynukes . . . with a yield of about 1,000 tons," which could prevent contingency forces from being overrun before reinforcements arrive.[44]

Dowler and Howard argue that smaller nuclear weapons would be more credible because they would not violate the principle of proportionality of response and would have minimal collateral damage and fallout. Small nuclear weapons would provide the capability that the United States lacked in the Iraqi conflict—the ability to destroy deeply buried command and control facilities and the ability to completely destroy an incoming ballistic missile warhead.[45]

Some military planners argue strongly for the development of the small-yield nuclear weapons. Along with the current downsizing of the military and the strategy of flexible contingency forces and force reconstitution comes the real

danger of not having several months to build up, as was the case in Desert Storm. During the cold war, the United States placed tactical nuclear weapons in Europe to prevent the Soviet Union from quickly overrunning prepositioned forces. The same logic applies to US involvement in regional contingencies.

On the con side, the tremendous changes in the former Soviet Union have rendered a current political climate that makes it unlikely that policymakers will listen to any proposal for the development of new nuclear weapons, particularly any that would potentially lower the usability threshold. While the small-yield nuclear weapons make good military sense and fit well in the US national military strategy, the current political climate calls for the destruction of nuclear weapons having similar capabilities. The removal and destruction of ground-launched cruise missiles and Pershing II missiles from Europe under the INF Treaty eradicated some viable platforms that contained nuclear warheads with selectable yields on the order of tinynukes. Additionally, the president's unilateral initiatives included the removal and/or destruction of many theater nuclear weapons that have selectable yields on the order of the mini and tiny nuclear categories.

Thomas Ramos (special scientific advisor to the assistant secretary of defense—atomic energy, under the Bush administration) submits that it is necessary to modernize US tactical nuclear weapons to achieve the national defense strategy. He notes the lack of discussion of tactical nuclear weapons when Dick Cheney and Colin Powell testified before the Senate Armed Services Committee in February 1991 and concludes that "what appears to be missing at present is a comprehensive plan to incorporate theater nuclear weapons into the National Defense Strategy." He states that the requirement for theater nuclear weapons is not only scenario-dependent but,

> the presence of nuclear weapons in forward deployed regions serves the purpose of sending an unequivocal message to all adversaries and allies about American intentions. The very presence of nuclear weapons in forward-deployed areas can act as a deterrent against the proliferation of nuclear weapons.[46]

Thomas-Durell Young (associate research professor of national security affairs at the Strategic Studies Institute of the US

Army War College) suggests that President Bush was premature with his sweeping reductions of tactical nuclear weapons on 27 September 1991 and that he has, in essence, redefined "NATO's on-call substrategic nuclear capabilities" without "a full review of future security requirements."[47] Young believes that by reducing allied tactical nuclear capability to gravity bombs, President Bush has essentially declared a "minimum deterrence" strategy for NATO. Young further argues that future threats to NATO warrant a wide range of response options.[48] He also suggests an alternative view to the idea that highly accurate conventional weapons are replacing the need for tactical nuclear weapons:

> The argument that sophisticated conventional munitions can provide the alliance with a massive nonnuclear strike capability misses the point. The issue now, as it has been in the past, is one of deterrence, not warfighting. Even if one accepts the debatable proposition that modern precision-guided conventional munitions can produce a similar level of deterrence, financial exigencies in Europe will substantially limit the acquisition of these types of munitions in the years to come. Hence, as NATO has long recognized, nuclear forces are a cheap way of achieving effective deterrence.[49]

Nuclear Strategy

What nuclear strategy will best accomplish national security objectives? Writing with regard to President Bush's unilateral initiatives, Charles Glasser (assistant professor in the Irving B. Harris School of Public Policy Studies at the University of Chicago) states:

> The United States has now proposed the first basic changes in U.S. strategic nuclear forces, but the strategy that these forces must support, and how and why it differs from America's cold war strategy, have yet to be articulated.[50]

A new US nuclear policy was certainly not on the agenda during the 1992 presidential campaigns and debates. Some observers suggest that the reason may be that the United States is still trying to define its role in world affairs. Robert J. Art (a research associate of Harvard's Center for International Affairs) asks,

> Now after its forty-five year battle with the Soviet Union, what should the United States do with its power? . . . Exactly where on the continuum between the two grand alternatives—unbridled internationalism and constricted isolationalism—should the United States draw the line?[51]

The selection of Bill Clinton for president suggests the desire of Americans to turn inward after the lengthy cold war. Such US security objectives as promoting democracy, advancing human rights, and strengthening free market economies may take a back seat to solving US economic problems. President Clinton's proposals for additional military reductions indicate a further scaling back of overseas involvement and US military power projection.

Deterrence

The Clinton administration most assuredly will continue to advocate the need for at least minimum levels of deterrence. Traditionally, deterrence has been defined as holding at risk what the enemy holds most dear. Even in the case of the 45-year-old cold war relationship with the Soviets, the United States always held some concern about how to determine what the Soviets considered most dear. The tremendous difference between Eastern and Western thinking left considerable doubt.

George Quester (professor of government and politics at the University of Maryland) asserts that there has been a problem with deterrence for decades and the changes in Eastern Europe add to these problems. He identifies four concerns:

> the problem of maintaining adequate retaliatory forces; the problem of maintaining command and control to prevent unauthorized nuclear attacks; the problem of reconciling nuclear deterrence to Western moral traditions; and the problem of extending nuclear deterrence to prevent conventional attacks.[52]

He asserts that

> deterrence theory has always maintained that both sides must be able to launch a formidable countervalue attack even after absorbing a counterforce attack designed to prevent such retaliation. If either side was able to neutralize the other's forces, nuclear deterrence would fail.[53]

Such statements are only partially true. For years the US strategy has been one of counterforce—even retaliatory counterforce.

Secondly, deterrence lives in the eyes of the deteree. What constitutes a formidable attack? And how does one determine whether it can neutralize the other side's forces? It is all a matter of perception. Deterrence is not a matter of absolute truth but, rather, one of perceived vulnerability.

Americans have accepted President Bush's unilateral initiatives and the START II agreement as being in their best interest. That the disintegration of the Soviet Union provided a potential opportunity for the United States to become not only the sole superpower but finally to achieve nuclear superiority over the Soviets, in both offensive and defensive capability, never became an issue. With regard to US nuclear posture, a position has been generally accepted, seemingly without question, "that, over the long term, U.S. security will be greater in a world of mutual vulnerability."[54]

Analysts and politicians are proposing nuclear strategies for the post–cold war era that run the gamut from minimum deterrence to counterforce targeting. Although a particular nuclear strategy and the number of weapons required to support it are closely linked, they are two distinctly different issues. Many authors fail to present these as two separate subjects, choosing to link nuclear strategy with a specified number of nuclear weapons and discussing alternatives as a combined entity. For these cases, this analysis has separated strategy from number of weapons.

Countervalue

Nuclear strategy could be well on its way to its first complete cycle. With a minimum number of atomic weapons, early US war plans called for attacks on Soviet cities. Once the Soviets acquired atomic weapons, US strategy shifted to targeting Soviet nuclear delivery capability. Early ballistic missile warheads were inaccurate and thus could threaten only population centers. Eventually, highly accurate weapons systems held opposing ICBM silos at risk, and counterforce strategies were in vogue. With the tremendous nuclear reductions under START II, some analysts are proposing further reductions. Retention of warheads—in the vicinity of 100—are advocated by a few individuals. Such low numbers require a countervalue strategy commonly referred to as

"countercity," which amounts to holding civilian population centers at risk.

Given the redirection under President Bush—that of focusing on regional conflicts, safety and security of nuclear weapons, and development of GPALS to defend against accidental, unauthorized, or third world use, Garrity and Weiner propose that nuclear weapons may be moving to the periphery of US strategy:

> If taken to its logical conclusion, this approach will rapidly lead the United States to cease to regard nuclear weapons as the cornerstone of its national security and to "segregate" any remaining nuclear forces from its force structure and strategy.[55]

This would lead to a "countercity targeting strategy" under a policy of "existential deterrence" in which nuclear stockpiles would be reduced to fewer than 2,000 warheads, while modernization and testing programs would be terminated. Alternately, they indicate that the United States may not make such deep cuts, wishing to hedge against the possibility of future uncertainties.[56]

Charles Glaser outlines three alternatives to the current state of mutual vulnerability between the United States and the CIS:

> Defense dominance—both countries are protected from annihilation by highly effective strategic defenses; U.S. superiority—strategic defenses and counterforce protect the United States, while it maintains its ability to annihilate Russia; and nuclear disarmament—arms control agreements, requiring near-total cuts in nuclear forces, protect both countries.[57]

Glaser states that most analyses focus on these three conditions because analysts assume that these alternatives would bring greater security to the United States. He argues that the United States will be more secure in a state of continued mutual vulnerability by employing a flexible countervalue strategy. Kosta Tsipis agrees with this assertion and states that US and Russian arsenals will maintain "the symmetrical state of vulnerability that both undergirds and makes necessary the new approaches of common security and win-win negotiated resolution of conflict that the nuclear nations—and their allies—are in the process of adopting toward each other."[58]

Countervalue strategy suffers two main criticisms. First, analysts have criticized the policy of targeting leadership, since it undermines the objective of achieving a quick end to war: obliterating leadership leaves no one to capitulate. Second, a large portion of society sees the targeting of cities, which amounts to the civilian population, as morally wrong.

Counterforce

Janne E. Nolan (a Brookings Institution senior fellow) allows a vast difference in opinion between the military and most politicians over the need for and employment of nuclear weapons. Most politicians see "the need for 'assured retaliation,' in which each side maintains only enough nuclear forces to ensure that some of its weapons would survive an attack and enable the country to retaliate,"[59] whereas the military has been driving the need for "counterstrategic" capability.

> Over time, military planners have come to dominate not only operational decisions—which targets to hit with which weapons—but also decisions about the numbers and types of nuclear weapons "required" to fulfill national plans. War-fighting plans have a far stronger influence over force requirements and arms control than does political rhetoric about the basis of nuclear deterrence. As Paul Warnke, the former director of the U.S. Arms Control and Disarmament Agency, says, "The SIOP drives everything—force levels, budgets, and arms control."[60]

Two complementary problems contribute to this dilemma—military resistance and civilian disinterest. The development of the Single Integrated Operational Plan (SIOP) by the joint strategic target planning staff (JSTPS) at US Strategic Command (formerly SAC) in Omaha, Nebraska, is a detailed and lengthy process that few civilian officials have ever taken the time to get involved with.[61] And while the military has traditionally resisted civilian involvement, such excuse is a lame one. One would think that at least the president of the United States would be familiar with the war plans, since he would have fewer than 30 minutes to make a decision in the event of a Soviet surprise attack. Yet, "other than Jimmy Carter, every president since Franklin Roosevelt has expressed only a passing interest in the subject. In 1988, a former chair

of the Joint Chiefs of Staff noted that Ronald Reagan's knowledge of the SIOP was practically nonexistent."[62]

Michael J. Mazarr (senior fellow in international security studies at the Center for Strategic and International Studies) performed a literature survey to summarize some of the "key writings and fundamental ideas in circulation on the subject of nuclear strategy and arms control." He identifies "two primary cold war schools of thought on nuclear weapons—the warfighters and the assured destruction proponents," whom he terms "maximalists" and "minimalists." The maximalists favor a continuation of a cold war strategy comprised of "counterforce targeting and extended deterrence." In contrast, the minimalists contend that "U.S. nuclear weapons should be used for nothing but deterring nuclear arsenals of other counties."[63] Mazarr points out the real danger of these two extremes:

> Maximalism may go too far in integrating dozens of first-strike scenarios into day-to-day U.S. planning; Minimalism may err on the opposite side, fervently ruling out—and therefore failing to equip U.S. nuclear forces and strategy for—roles they might be forced to serve.[64]

Counterforce strategy has been declared by many politicians and analysts to be a destabilizing strategy, since a country being attacked must launch its weapons upon warning of an inbound attack—or even prior to receiving warning—to avoid the possible destruction of its weapons on the ground. Of primary concern in this instance are MIRVed, silo-based ICBMs, which are lucrative targets for a nuclear first-strike and thus are too valuable an asset not to launch upon attack warning. The banning of these systems under START II will help with this stability problem; however, the retention of silo-based ICBMs will continue to provide a destabilizing strategic posture.

Mazarr suggests a third alternative—a counterpower strategy that targets nonnuclear military forces. He states that since counterpower strategy "does not threaten either side's nuclear deterrent, it is not destabilizing like counterforce; yet, as specifically countermilitary, it avoids some of the moral and credibility-related drawbacks of countervalue policies."[65]

Paul Nitze favors a similar strategy—a counterforce strategy against "conventional forces and installations." He contends that conventional targets are the most valuable targets, since

an aggressor would need to eliminate them to "consolidate any gains achieved in a nuclear strike."[66]

While a counterpower strategy against conventional forces provides a theoretically sound argument, there are at least three problems associated with it. First, how does one side convince the other that nuclear assets are not being targeted along with conventional ones? Apart from stationing Russians in US ICBM silos and aboard submarines, there would be no way for Russians to verify ballistic missile aimpoints. Second, it fails to address the complications involved in targeting mobile conventional forces. Aside from a barrage attack, what does one target? Troops? Tanks? Command and control? Third, a counterconventional strategy was the rationale behind the development of tactical nuclear weapons. One can argue that a greater sense of strategic stability could be achieved by banning ICBMs and SLBMs and by relying on air-delivered nuclear weapons for a counterconventional strategy.

Multilateral Concerns

To date, most nuclear force analyses have focused on the US-Soviet bilateral relationship. It's not clear whether anyone has a good grasp on how to analyze nuclear weapons in a multilateral sense, particularly when the traditional concept of deterrence may be totally invalid for the post–cold war era. Furthermore, the literature is practically void of any discussion of the effects of US nuclear weapon reductions on other countries' perceptions of US power and will. For example, a focus on regional issues coupled with severe reduction in nuclear weapons could well be perceived by the rest of the world as isolationist in nature and certainly a weakening in US military power and resolve. Hence, third world nations may be more apt to acquire nuclear weapons for themselves and challenge US resolve.

How Many Nuclear Weapons?

How many and what types of nuclear weapons does the United States need to implement its nuclear strategy? Nuclear strategy should dictate the number of nuclear warheads

needed; however, too often strategists apply reverse logic, as seen in the following quote. Walter Slocombe asks:

> Should nuclear weapons be reduced to a level of a few thousand warheads (allowing for a deterrence doctrine based on the capability to strike both military targets and cities), or can reductions be made to a level of a few hundred (allowing for a deterrence doctrine based on large-scale attacks on cities)?[67]

The real danger of this bottom-up approach is that within debate and discussion circles, an unsubstantiated number is often better than no number at all. Once planners suggest a number as a possibility, they tend to migrate toward that number in the absence of any better number. For example, about the time the United States and the CIS stood poised to really sign START, discussions about a possible START II sprang up in analytical circles around the United States. For lack of any formal guidance or a better starting point, observers assumed that all START limits would be cut in half. Most analyses proceeded with these general assumptions. It is no coincidence that a year later, the Washington Summit agreement proposed levels approximately half those of START.

Mazarr suggests that most nuclear analysis can be lumped into one of three camps. Maximalists propose nuclear forces on the order of "one-third to one-half the size of those maintained during the cold war."[68] He states that "to support their global targeting policies, counterforce doctrines, and extended deterrence pledges, maximalists would be very uncomfortable going below 3,000 or so warheads for the foreseeable—and perhaps indefinite—future." Mazarr suggests that "minimalists tend to view the deterrent effect of even a few dozen nuclear bombs as sufficient."[69] The top end of the minimalist position is probably in the category of a few hundred. Mazarr suggests 1,000–2,000 as a good moderate position and locks on to 1,000 as a good, round, sellable number, but he offers no rationale for his estimate.[70] This approach compromises on numbers, fails to consider strategy, and ignores warhead yield altogether.

The following paragraphs summarize just a few of the proposals that have been suggested for nuclear weapon levels. A sampling is provided to illustrate the minimalist, maximalist, and moderate positions espoused by Mazarr.

Nitze does not concur with strategists who want to reduce the US arsenal to a few hundred weapons. These low numbers of warheads require a countercity targeting strategy which he feels is morally unacceptable and therefore not a credible deterrent.[71] Nitze favors a counterforce strategy and suggests an arsenal size of from 3,000 to 5,000 warheads, "with further cuts possible as conventional weapons gain additional effectiveness or if other nuclear powers become more willing to participate in arms reductions." He sees little need for tactical nuclear weapons beyond "a small force of air-delivered weapons in the European stockpile."[72]

CISAC proposed a reduction to an actual 3,000–4,000 strategic warheads, predicated on making the remaining forces "more survivable." The committee suggests reducing the number of tactical nuclear weapons but does not provide any numbers. It also indicates that over time, levels of 1,000–2,000 warheads could be reached—given appropriate agreements, verification, and confidence-building measures.[73]

Ivo Daalder (director of research at the Center for International Security Studies) wants to reduce the number of warheads to the hundreds but only if the remaining weapons are survivable. He states, "As long as remaining forces are invulnerable to preemption and capable of riding out an attack, the actual number can be in the hundreds, rather than the thousands."[74]

Daniel Ellsberg (senior research associate of the Center for Psychological Studies in the Nuclear Age, Harvard Medical School) advocates a minimum deterrent level based on survivable warheads. Citing Herbert York, first director of Lawrence Livermore National Laboratory, he states,

> The number of survivable weapons needed to deter the kind of adversary that can be deterred is far below the level of [the] 1,000 frequently mentioned. He suggested the number is "somewhere in the range of one, 10, or 100," and "closer to one than it is 100."[75]

Christopher Paine, a senior research associate, and Thomas Cochran, a senior staff scientist at the Natural Resources Defense Council, Washington, D.C., favor a level of a few hundred weapons but base their recommendation on verification rather than on survivability. They assert that an "effective verification system could make it possible for the nuclear powers to slash their arsenals to a few hundred weapons each."[76]

Multilateral Concerns

The discussion of large reductions also requires the consideration of the other nuclear powers. At what point do Great Britain, France, and China become players in the reduction game? At some point alliances will play a role from both perspectives. The United States has stated a policy to work multilaterally yet retain the capability to act unilaterally. A CIS proposal to reduce strategic warheads to 1,000, provided that the sum of US, British, and French strategic warheads also equals 1,000, would not be acceptable to the United States. Likewise, a US proposal to bilaterally reduce to 1,000 strategic warheads, while not taking into account alliances, would probably not be acceptable to the CIS.

Carl Kaysen, Robert S. McNamara, and George W. Rathjens propose "minimal" deterrent forces that can destroy approximately a dozen targets in a retaliatory attack. They suggest that the United States and the CIS could unilaterally reduce their arsenals to approximately 1,000 warheads as an initial step to achieving these levels. They suggest that "at some point—perhaps in the neighborhood of 1,000 US and Soviet warheads—France, the United Kingdom, and China would have to be drawn into the reduction process."[77]

Paul Warnke, an eliminationist, concurs that the United States and the CIS can make unilateral reductions to "no more than 1,000 nuclear warheads and no more than one to a delivery vehicle" as a first step toward total elimination.[78]

Gen John T. Chain does not favor deep reductions that would place all nuclear powers on the same plane.

> If the United States and the Soviet Union reduce strategic nuclear forces drastically, then nations such as France, Great Britain, China, and others become equals. The concept that a world of many superpowers is less stable than a bipolar one is not new, and a less stable world is certainly not in U.S. interests.[79]

Paul Nitze concurs with this evaluation:

> U.S. strategic forces should remain at least equal in size and effectiveness to the strategic arsenal in the former Soviet Union. The United States should also retain a strategic reserve that would be as large as the strategic arsenals of all other nuclear nations combined to prevent their domination in the aftermath of a U.S.-Russian or comparable exchange.[80]

Harold A. Feiveson, senior research policy scientist, and Frank N. von Hipple, professor of public and international affairs, Princeton University, suggest a way to reduce US and CIS arsenals significantly without creating parity between all nuclear states. They propose a "finite-deterrence" level of about 2,000 highly survivable warheads. The 2,000 level is the lowest they recommend without involving the other nuclear states.[81] They suggest that "France, Britain, and China should be willing to limit their arsenals to 200–500 warheads each," given US and Soviet willingness to reduce to the 2,000 level.[82] Glaser agrees with this level of warheads and states, "An assured destruction capability would require fewer than two thousand weapons, and possibly fewer than one thousand. This range depends on the yield of the weapons, their survivability and penetrability, and whether the United states is attacked by surprise or with warning."[83]

So, depending on the particular strategy, analysts advocate warhead levels between one and 4,000. In some cases, they find it hard to determine whether these numbers refer strictly to strategic warheads or to total operational warheads only. Some authors specify survivable warheads, leaving the reader to determine the total number of warheads needed based on assumptions made about system capabilities and potential scenarios.

Nuclear Posture

How should the United States posture its nuclear forces to best achieve national security objectives? Achievement of national military objectives short of war involves the ability to clearly communicate US national will and resolve to defend its vital security interests. US nuclear posture is a communication of national resolve to use nuclear weapons if necessary.

Former Air Force chief of staff Larry Welch suggests four major objectives for future US strategic nuclear forces:

- Ensure a deterrent force adequate to convince a rational adversary that he has nothing to gain, and everything to lose, in initiating a nuclear attack. The force must also be adequate to deal with potential "third powers," armed with nuclear or other mass-destruction weapons, whose behavior may be less rational.

- Increase stability by reducing the incentives for the first strike, reducing the concentration of warheads on strategic delivery vehicles as a whole, and giving priority to highly survivable systems.
- Reduce the cost of strategic nuclear deterrent forces.
- Reduce incentives for destabilizing countermeasures.[84]

During the SALT and START negotiations, much attention and discussion revolved around the issue of stability. One of the predominant concerns was crisis stability.

Crisis Stability

Crisis stability measures each side's resistance to use their nuclear weapons out of fear that they may be annihilated before they can be used. The major contributor to crisis stability is weapon survivability—the ability to deploy a weapon system in such a way that it could ride out a nuclear attack and survive. This is the main reason ICBMs—and, in particular, MIRVed ICBMs—are so destabilizing. With the advent of greater accuracy, the only way to ensure survivability is to launch them out under attack—a term quite often referred to as *use-or-lose*. Submarines at sea and deployed, mobile, land-based missiles are almost fully survivable. The ability to flush aircraft from their bases before incoming missiles could destroy them was the reason for maintaining bombers on alert for so many years.

The Air Force considers the manned bomber to be the best system to provide stability during times of crisis. In the words of Gen John T. Chain,

> During crisis situations with the Soviet Union, or any other possessor of nuclear weapons, a premium is on U.S. forces that can provide our national leadership with a variety of stabilizing response options to help de-escalate the crisis. The manned bomber can be used as a show-of-force to demonstrate resolve by increasing the number of aircraft on alert, deploying them to dispersal bases, or putting them airborne. This offers a rapid-response operational and employment flexibility that is highly visible and unmatched by the other Triad forces.[85]

The majority of nuclear arms reduction talks have revolved around achieving greater strategic stability with the reductions. Planners have stressed the need for survivable basing and deMIRVing land-based ICBMs to minimize the

benefit from a preemptive strike. They also have emphasized in recent years ways to reduce "hard-target kill" capability.

Somewhere in the midst of the unilateral initiatives and the Washington Summit agreement, someone subordinated the issue of crisis stability budget concerns. The president canceled both programs designed to provide survivability to the US ICBM force—SICBM and Rail Garrison. He also took bombers off alert—the same system that the START negotiators agreed was the most stabilizing, so much so that they instituted discount rules to incentivize its employment. President Bush also placed ground and sea tactical nuclear weapons in storage. Though not a likely scenario, if the Russian republic were to launch a bolt-out-of-the-blue attack on the United States today and the president elected not to launch ICBMs on warning, the only survivable nuclear weapons would be those deployed on submarines at sea.

By not posturing nuclear forces for survivability, one invites a preemptive strike. Sergei Kortunov asserts that new arms control negotiations should "emphasize removing incentives for a nuclear first strike, reducing the concentration of warheads on strategic weapons, and giving priority to highly survivable systems."[86]

Paul Nitze states that the "restructuring of forces will be just as important as the reductions." He suggests stabilizing measures to include the elimination of land-based MIRVed weapons, reducing missile throw weight, banning new technology development that would threaten nuclear force survivability, and making remaining forces as flexible as possible.[87] As a means of stability, Paul Warnke suggests that the United States "explore a ban on all ballistic missiles" that "would in no way diminish the viability of the U.S. deterrent, which can be adequately insured by the U.S. bomber force alone."[88]

Harold A. Feiveson and Frank N. von Hipple want to achieve survivability by mobile basing all ICBMs as single-warhead, road-mobile SICBMs or SS-25s, continuing sea-basing on SSBNs, and maintaining aircraft on alert. They suggest that "to minimize dependence on strategic warning," the SSBNs would be on at least a "50 percent at-sea rate," aircraft would be on "at least a 50 percent runway alert rate," and mobile ICBMs would "be kept dispersed in ones or twos."[89]

This chapter has provided a broadbrush presentation of many ideas that are on the table for the future direction of the US nuclear arsenal. Since complete elimination of nuclear weapons is not possible in the near future, the United States requires a nuclear strategy for the post–cold war era. The choice of strategy will dictate the number of nuclear weapons necessary to support national security.

Many other considerations must be taken into account when making future decisions. One factor is cost. Nuclear weapons are relatively cheap, cheaper than some of their high-tech conventional counterparts. Chemical and biological weapons, commonly referred to as "the poor man's nukes," cost even less. While the United States rushes toward nuclear disarmament and is readily embracing high-tech conventional munitions, other countries do not have the budget or the technology to pursue the conventional route. Nuclear, chemical, and biological weapons may be their only hope of remaining competitive on the battlefield. The next chapter discusses some of these potential threats.

Notes

1. Paul C. Warnke, "Missionless Missiles," *The Bulletin of Atomic Scientists* 48, no. 4 (May 1992): 36.

2. William M. Arkin, Damian Durrant, and Hans Kristensen, "Nuclear Weapons Headed for the Trash," *The Bulletin of Atomic Scientists* 47, no. 9 (December 1991): 19.

3. David S. Yost, "The Delegitimization of Nuclear Deterrence?" *Armed Forces and Society* 16, no. 4 (Summer 1990): 487.

4. Ibid., 490–92.

5. Kosta Tsipis, "The Future of Nuclear Deterrence," in *World Security: Trends and Challenges at Century's End*, Michael T. Klare and Daniel C. Thomas, comp. (New York: St. Martin's Press, Inc., 1991), 65.

6. See Jack Mendelsohn, "Enroll in Five Step Program," *The Bulletin of Atomic Scientists* 48, no. 4 (May 1992): 40. His understanding of submarine capabilities and operations is a bit lacking, however. He proposes that submarines could patrol out of range of targets. While this would have been valid for *Polaris*- and *Poseidon*-class submarines, Trident missiles have the capability to reach Russian targets from US ports. See Maj Gen Boris Surikov, "USSR Breakup Makes Nuclear Reductions a Five-Way Deal," *Armed Forces Journal International* (March 1992): 38–39. Surikov advocates no-notice inspections to insure that cheating does not occur and that the CIS and the United States should explore the possibility of a space-based monitoring system.

7. The details of this plan were discussed in chapter 1.

8. Randall Forsberg, "Keep Peace by Pooling Armies," *The Bulletin of Atomic Scientists* 48, no. 4 (May 1992): 41–42.

9. David Cortright, "From the Movement to the Moment," *The Bulletin of Atomic Scientists* 48, no. 4 (May 1992): 15.

10. Joseph Rotblat, "Citizen Verification," *The Bulletin of Atomic Scientists* 48, no. 4 (May 1992): 19.

11. Richard J. Barnet, "Twin Anachronisms: Nuclear Weapons and Militarism," *The Bulletin of Atomic Scientists* 48, no. 4 (May 1992): 26.

12. Theodore B. Taylor, "Just Unplug 'em," *The Bulletin of Atomic Scientists* 48, no. 4 (May 1992): 28.

13. Adm Paul H. Nitze, The 1985 Alastair Buchan Memorial Lecture, 28 March 1985, in *Survival* 27, no. 3 (May/June 1985): 106.

14. Patrick J. Garrity, "The Depreciation of Nuclear Weapons in International Politics: Possibilities, Limits, Uncertainties, *Journal of Strategic Studies* 14, no. 4 (December 1991): 463.

15. Ibid., 465.

16. Ibid., 500–501.

17. Nitze, 101.

18. Some 300,000 German civilians were killed and 780,000 wounded and 330,000 Japanese civilians were killed and an additional 476,000 wounded in Allied bombing attacks. The two atomic bombs accounted for approximately 100,000 of those deaths and 100,000 of those injured. *The United States Strategic Bombing Surveys* (Maxwell AFB, Ala.: reprinted by Air University Press, October 1987), 6, 92, 100–101.

19. Carl Kaysen, Robert S. McNamara, and George W. Rathjens, "Nuclear Weapons After the Cold War," *Foreign Affairs* 70, no. 4 (Fall 1991): 102.

20. "The Future of the U.S.-Soviet Nuclear Relationship," National Academy of Sciences Committee on International Security and Arms Control (CISAC) (Washington, D.C.: National Academy Press, 1991), 3.

21. Paul H. Nitze, "Keep Nuclear Insurance," *The Bulletin of Atomic Scientists* 48, no. 4 (May 1992): 34.

22. Yost, 488.

23. James Kitfield, "The Perils of Proliferation," *Government Executive* 22, no. 10 (October 1990): 34.

24. Quoted in McGeorge Bundy, "Nuclear Weapons and the Gulf," *Foreign Affairs* 70, no. 4 (Fall 1991): 84.

25. Kitfield, 34.

26. Lisa Beyer, "Military Options: Three Ethical Dilemmas," *Time*, 4 February 1991, 49.

27. Bundy, 87.

28. John Barry, "The Nuclear Option: Thinking the Unthinkable," *Newsweek*, 14 January 1991, 17.

29. Rotblat, 19.

30. President George Bush, *National Security Strategy of the United States* (Washington, D.C.: The White House, August 1991), 26.

31. Larry H. Addington, *The Patterns of War Since the Eighteenth Century* (Bloomington, Ind.: Indiana University Press, 1984), 248.

32. Barnet, 27.

33. For a more in-depth look at these issues, see the series of articles in *The Bulletin of Atomic Scientists* 48, no. 4 (May 1992).

34. Wolfgang Altenburg, "Defensive Alliance in a Nuclear World," *Nato's Sixteen Nations* 34, no. 7 (December 1989): 20.

35. Walter B. Slocombe, "Strategic Stability in a Restructured World," *Survival* 32, no. 4 (July/August 1990): 302.

36. Nitze, "Keep Nuclear Insurance," 34.

37. Sergei Kortunov, "Negotiating on Nuclear Weapons in Europe," *Survival* 33, no. 1 (January/February 1991): 52.

38. Beatrice Heuser, "What Nuclear Strategy For Post-Cold War Europe?" *Orbis* 36, no. 2 (Spring 1992): 217.

39. Patrick J. Garrity and Sharon K. Weiner, "U.S. Defense Strategy After the Cold War," *The Washington Quarterly* 15, no. 2 (Spring 1992): 67.

40. "Gorbachev Criticizes Lack of US Policy," *Washington Post*, 7 April 1989, 14, quoted in Garrity, "The Depreciation of Nuclear Weapons in International Politics," 472.

41. Scott D. Sagan, *Moving Targets: Nuclear Strategy and National Security* (Princeton, N.J.: Princeton University Press, 1989), 4–5.

42. Thomas W. Dowler and Joseph S. Howard II, "Countering the Threat of the Well-Armed Tyrant: A Modest Proposal for Small Nuclear Weapons," *Strategic Review* 19, no. 4 (Fall 1991): 36.

43. Ibid., 39.

44. Ibid., 36–38.

45. Some observers believe that the development of new tactical nuclear weapons will have a destabilizing effect and give third world countries reasons to develop their own nuclear weapons. See William M. Arkin and Robert S. Norris, "Tinynukes for Mini Minds," *The Bulletin of Atomic Scientists* 48, no. 3 (April 1992): 24–25.

46. Thomas F. Ramos, "The Future of Theater Nuclear Forces," *Strategic Review* 19, no. 4 (Fall 1991): 43.

47. Thomas-Durell Young, "The Need for NATO-Europe's Substrategic Nuclear Weapons," *Orbis* 36, no. 2 (Spring 1992): 228.

48. Ibid., 229–31.

49. Ibid., 231–32.

50. Charles L. Glaser, "Nuclear Policy Without an Adversary: U.S. Planning for the Post Soviet Era," *International Security* 16, no. 4 (Spring 1992): 34.

51. Robert J. Art, "A Defensible Defense," *International Security* 15, no. 4 (Spring 1991): 5.

52. George H. Quester, "The Future of Nuclear Deterrence," *Survival* 34, no. 1 (Spring 1992): 74.

53. Ibid., 74.

54. Glaser, 35.

55. Garrity and Weiner, 67.

56. Ibid.

57. Ibid., 38.

58. Tsipis, 65.

59. Janne E. Nolan, "U.S. Strategy After the Cold War: Who Decides?" *Technology Review* 94, no. 1 (January 1991): 54.

60. Ibid., 55–56.

61. One should note that in recent years a greater involvement in the targeting process by DOD civilians has occurred.

62. Nolan, 56.

63. Michael J. Mazarr, "Nuclear Weapons After the Cold War," *Washington Quarterly* 15, no. 3 (Summer 1992): 185.

64. Ibid., 190–91.

65. Ibid., 194.

66. Nitze, "Keep Nuclear Insurance," 34.

67. Slocombe, 299.

68. Mazarr, 188.

69. Ibid., 195.

70. Ibid., 196.

71. Nitze, "Keep Nuclear Insurance," 34.

72. Ibid., 35.

73. "The Future of the U.S.-Soviet Nuclear Relationship," 3.

74. Ivo H. Daalder, "The Future of Arms Control," *Survival* 34, no. 1 (Spring 1992): 57.

75. Daniel Ellsberg, "Manhattan Project II," *The Bulletin of Atomic Scientists* 48, no. 4 (May 1992): 44.

76. Christopher Paine and Thomas B. Cochran, "So Little Time, So Many Weapons, So Much To Do," *The Bulletin of Atomic Scientists* 48, no. 1 (January/February 1992): 15.

77. Kaysen, McNamara, and Rathjens, 107–8.

78. Warnke, 38.

79. Gen John T. Chain, "Peace Through Strength," *Defense 90* (July/August 1990): 23.

80. Nitze, "Keep Nuclear Insurance," 34.

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86. Sergei Kortunov, "START II and Beyond," *The Bulletin of Atomic Scientists* 46, no. 8 (October 1990): 21.

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Chapter 4

The Threat—Weapons of Mass Destruction

Since the dissolution of the Warsaw Pact and the collapse of the Soviet Union, DOD has faced increasing difficulty in defining a military threat to US national security on which to base nuclear force structure requirements. The threat of a CIS invasion of Europe or nuclear strike against the United States is, at least for the time being, practically unthinkable. Until recently, the Soviet threat formed the basis for US force structure planning.[1] "The decline of the Soviet threat has fundamentally changed the concept of threat analysis as a basis for force structure planning."[2] According to Gen Colin Powell, "The real threat we now face is the threat of the unknown, the uncertain. The threat is instability and being unprepared to handle a crisis or war that no one predicted or expected."[3]

In the absence of a true threat, analysts must employ hypothetical scenarios to evaluate nuclear and conventional force needs and capabilities. The press severely criticized this approach when the seven hypothetical defense planning guidance scenarios were leaked in February 1992. (The criticizing press failed to propose an alternate methodology.)

Many analytical groups as well as individuals have provided their own independent assessments of how to determine force structure needs and how many nuclear weapons should be retained. Chapter 3 examined a variety of these opinions regarding the future need for US nuclear weapons. The majority of these studies and articles have examined nuclear requirements from a purely subjective "feel" rather than using objective criteria. Such "analyses" recommend an arbitrary number of nuclear weapons to meet US needs. This bottom-up approach defines nuclear requirements in total deference to national objectives and strategy. The danger of such an approach, however, is that one opinion may have just as much validity as another—without some objective evaluation criteria. There is no *wrong* answer. This chapter examines present and

potential nuclear, chemical, and biological threats to US national security interests.[4]

Proliferation

Armed with a new defense strategy, the United States has focused much attention on sizing its military forces to meet the most likely threat—regional conflicts. The greatest threat in a regional conflict is one that involves weapons of mass destruction. President Bush stated, "In the post–Cold War era, one of our most threatening national security challenges is the spread of weapons of mass destruction and the means to deliver them."[5]

According to Dick Cheney, secretary of defense in the Bush administration,

> it is estimated that by the year 2000 at least 15 developing nations may have the ability to build ballistic missiles—eight of which either have or could be near acquiring nuclear weapons. Perhaps as many as 30 may have chemical weapons, and 10 could deploy biological weapons.[6]

US Approach to Proliferation

In the 1991 *National Security Strategy of the United States,* President Bush stated, "A new world order is not a fact; it is an aspiration—and an opportunity . . . to build a new international system in accordance with *our own values* and ideals"[7] [emphasis added]. The key is the phrase, "our own values." President Bush merely affirmed what the rest of the world already suspected—that the United States will use its superpower status to direct a "new world order" in a direction amenable to itself. In his 1992 State of the Union Address, President Bush declared the United States "the one sole eminent power" and "the leader of the world." He also stated that "the world trusts us with power" and "trust[s] us to do what is right."[8] These sweeping generalizations are not true for all nations. A number of countries do not agree with US foreign policy, particularly when it involves the use of political, economic, or military power to leverage change. Several of these countries already have or are attempting to acquire

weapons of mass destruction. In the future, these countries may threaten or actually use weapons of mass destruction in protest of US foreign policy.

While declaring the United States to be the leader, President Bush also stated, "We cannot be the world's policeman with responsibility for solving all the world's security problems." In light of the successful multinational involvement in Desert Storm, President Bush suggested that the world is in a "period of transition" and can seize the opportunity for the United Nations to function in accordance with its designed purpose, "with the world's leading nations orchestrating and sanctioning collective action against aggression."[9] Multinational rule requires both a consensus for action and a willingness for nations to commit their own military forces against aggressors. Historically, consensus has been a problem. The United Nations Security Council has authorized the use of force only twice in its history—the Korean War and Desert Storm. In both instances, the United States provided the bulk of the manpower and the equipment. Until other nations belly up to the bar, the United States must maintain the capability to act unilaterally in potential future conflicts.

National leadership is optimistic that nonproliferation efforts will be successful in stemming the flow of weapons of mass destruction to third world countries. Like the old adage, "an ounce of prevention is worth a pound of cure," the Bush administration devoted an intense amount of effort to export controls designed to keep critical weapons and technologies out of the hands of would-be aggressors. Chapter 2 listed a number of the major nonproliferation efforts with which the United States is involved. These controlling actions are nothing more than the "haves" dictating policy to the "have-nots." Mariam Aftab (a research associate at the Institute of Strategic Studies, Islamabad) asserts:

> Thus what the "new world order" is advocating is not international arms control but a sort of an "arms apartheid" whereby certain countries will be allowed to build up military arsenals and others will be forced to cut defence expenditure in the name of either international or regional stability and/or development.[10]

In some cases, third world countries are beginning to voice objections to these conditions. For example, Mexico and other

third world countries have been vocal in demanding that a comprehensive test ban be instituted prior to renewing the 1968 nuclear non-proliferation treaty (NPT) in 1995. Yet, both Great Britain and the United States have been adamant regarding the need for continued nuclear testing.

> A halt to nuclear testing would not eliminate weapons or increase security, but it would erode confidence in our deterrent [sic] and severely restrict our ability to make improvements, especially in nuclear safety.[11]

But by taking such a position, the United States may be sending the wrong message.

> In putting itself at odds with influential third world countries on this issue, the administration is telling them, in effect, that it considers the maintenance and upgrading of its own nuclear forces to be more important than preventing the spread of nuclear weapons.[12]

The United States has, to date, relied on arms control measures as the primary method in achieving regional stability. Many third world countries view imposed arms control as discriminatory. A. Z. Hilali (a faculty member in the Department of International Relations at the University of Peshawar) states,

> In the third world itself the necessity for arms control is not seen as a burning issue. These countries point to the enormous arms potentials in the industrial countries and demand that they too should have to take effective measures to promote the processes of arms control and disarmament.[13]

Attacking the problem of weapons of mass destruction through arms control measures merely treats a symptom. Geoffrey Kemp (a special assistant to the president during the first Reagan administration and now a senior associate at the Carnegie Endowment for International Peace) states:

> If there is a lesson to be learned from the European experience on conventional arms-control negotiations, it is that until there is a movement toward the resolution of basic political and geographic aspects of the problem, detailed blueprints for arms control will not succeed. Europe at last is making progress on arms control because the political environment has changed.[14]

Further, Kemp states that third world countries view arms control as unwanted internal meddling:

> Many of the regional states see arms-control initiatives as an attempt to interfere with their national security needs at a time when the old collective security umbrellas are being removed. Most regional states believe that arms-control arrangements must either parallel or follow progress on the resolution of regional conflicts, not precede it.[15]

Aaron Karp (a guest scholar at the Stockholm International Peace Research Institute) agrees that arms control alone does not hold the answer. Although he deals specifically with ballistic missile proliferation, his insights pertain to all weapons.

> There is no simple solution to the missile proliferation problem. Like other major challenges to international security, missile proliferation cannot be taken care of through export controls, missile defenses, or regional arms control. Long-term security can be ensured only by reducing the motives behind missile proliferation. To reduce their prestige value, the international community can erect a new norm against ballistic missiles. But security motives can only be ameliorated by addressing regional political disputes.[16]

While US nonproliferation efforts may be effective in slowing the proliferation of weapons of mass destruction, they will not be able to prevent it. The 16 March 1992 edition of *U.S. News & World Report* states, "The West's attempt to prevent the spread of nuclear weapons has failed, and a dangerous new era of nuclear proliferation has begun."[17]

Proliferation Rationale

To understand the proliferation problem, one must understand the mind-set of third world leaders and, in particular, their reasons for wanting weapons of mass destruction and ballistic missile delivery systems. Traditionally, the possession of nuclear weapons has equated to having a strong voice in world affairs; all members of the UN Security Council are nuclear powers. Third world countries see the acquisition of nuclear weapons as a means toward furthering their political objectives. They have learned well from the United States and Soviet Union that policy is dictated through power.

Many third world countries want to acquire weapons of mass destruction to achieve regional supremacy. Regional disputes are often deeply rooted in national, cultural, and ethnic issues. An understanding of these issues is paramount to solving the problem.

Some third world countries may be acquiring weapons of mass destruction to counter US intervention in their affairs. After the Gulf War, a spokesman for Iran declared, "No country has the right to come here and make decisions about the future of Islamic countries."[18] Chemical and biological weapons have been termed the "poor man's nuke," providing third world countries with weapons of terror without the high cost of technology needed to develop nuclear weapons. However, Desert Storm may have made nuclear weapons a worthwhile investment for third world nations.

Desert Storm introduced a new strategic weapon—the precision-guided conventional munition. The high cost of this technology is prohibitive for third world countries. The United States showed the inability of the world's fourth largest army to stand up to such technology in Desert Storm. Nuclear weapons may become the most cost-effective means for poorer nations to compete against expensive high-technology weapons. One of the lessons learned from the Gulf War, according to the Indian military chief of staff, was that one should "never fight the United States without [having] nuclear weapons."[19] Yossef Bodansky (contributing editor of *Defense & Foreign Affairs Strategic Policy*) reported that the Gulf War produced a "sudden intensification of the drive to acquire nuclear weapons" by the North Korean, Iranian, Libyan, Syrian, and Cuban alliance.[20]

As mentioned earlier, many third world countries see arms control as discriminatory. Discriminatory arms control may act to encourage proliferation. Evaluating the NPT, George W. Rathjens and Marvin M. Miller (senior research scientist with the Department of Nuclear Engineering and the Center for International Studies at MIT) state:

> In its genesis and its implementation, it reflects policies of denial—and worse yet, of discriminatory denial: it attempts to prevent nonweapons states from acquiring nuclear weapons but permits the weapons states to retain them, further develop them, and acquire more.[21]

Further, they state:

> Attempts to prevent nuclear proliferation by denying nations access to nuclear technology or by destroying a nascent nuclear infrastructure might delay the attainment of such capabilities. But military actions are unlikely to eliminate motivations and may even reinforce them. The

> best hopes for reducing the impetus for vulnerable states to acquire nuclear weapons lie in guaranteeing security.[22]

Most countries desire weapons of mass destruction as a means of security. The increasing availability of modern conventional weaponry has contributed to the third world's arms race. Yahya Sadowski (senior fellow in the Brookings Foreign Policy Studies program) asserts that arms control proposals may "soon be eclipsed by a new round of the regional arms race. Arab states cannot afford to lag too far behind their neighbors in arms acquisition."[23] The reduction in conventional forces required under the Conventional Forces in Europe agreement will create a tremendous surplus of arms that third world countries will stand in line to purchase. In the absence of increased government restrictions, defense industries will continue to compete for third world dollars. Sadowski cites the United States as one of the major contributors to the third world arms race:

> Despite President Bush's assertion that "it would be tragic" if the Gulf War were followed by a renewal of the arms race in the region, the United States has emerged as the largest weapons proliferator in the Middle East market. When queried about this development, American officials replied with the formula that "there is absolutely no contradiction between arms control and arms sales."[24]

Jennifer Scarlott (fellow of the World Policy Institute at the New School for Social Research) states that the sale of conventional weapons has a direct link to proliferation of weapons of mass destruction:

> By continuing to transfer large amounts of conventional weapons to troubled regions, the United States and other arms suppliers are also contributing to the spread of chemical weapons and ballistic missiles, as heavily armed third world countries seek a qualitative edge in rapidly escalating regional arms races. This trend is not only dangerous in itself, but may increase pressure for nuclear proliferation.[25]

Ballistic Missiles. Ballistic missiles provide the delivery capability to make weapons of mass destruction truly weapons of terror. Janne E. Nolan suggests that there are several reasons third world countries pursue ballistic missile technology beyond its inherent characteristics of speed, difficulty to defend against, and capability of carrying weapons

of mass destruction: "Emerging missile programs also reflect countries' long-term aspirations for technology status . . . [and] the means to prosecute local and regional ambitions immune from the dictates of the superpowers." Further, she states, "For many developing states, the capability to produce weapons indigenously has become the *sine qua non* of national sovereignty."[26]

In addition to these reasons, Andrew Hull, writing for *Jane's Intelligence Review,* states, "Third World states, in part, acquire missiles for the same pragmatic reason as more industrialized states—deterrence."[27] He also cites several other reasons that third world countries will acquire ballistic missiles. Attacks on the enemy's population act to demoralize the population and make them feel vulnerable to attacks that cannot be defended. Ballistic missiles provide the capability for seizing military initiative and tactical surprise. They also can supplement aircraft strike and interdiction missions. Additionally, they may be used as a political statement, an act of retribution, or, even in the face of a tactical defeat, a sign to the enemy "that he is not yet in control of the situation."[28]

Ballistic missiles can carry out attacks on the enemy even when the enemy possesses air superiority. Although ballistic missiles are not "a cost-effective means for delivering conventional explosives," Steve Fetter (assistant professor in the School of Public Affairs at the University of Maryland, College Park) suggests that they can be cost effective at short ranges when aircraft attrition rates are high.[29]

Desert Storm taught the world a tremendous lesson about the value of mobile missiles. In the words of Barry Schneider and Larry Fink (weapons systems and political analysts for the Harris Group, Reston, Virginia), "Mobile missiles can avoid detection even when a superpower trains all its intelligence-gathering capabilities on the task of finding and counting them."[30] Saddam launched Scud missiles almost with impunity. Sometimes the presence of a missile's plume was the only way for the United States to successfully locate a launcher.

Given these reasons for the proliferation of weapons of mass destruction and the means to deliver them, what possible threats will the United States face in the post–cold war era? Many unclassified sources deal with current capabilities of

nations that possess weapons of mass destruction and ballistic missiles. Some of them are factual; some are speculative. When it comes to predicting the future, the literature is even more speculative. The following is a brief summary of some of these threats and is by no means exhaustive.

Nuclear Threats and Considerations

George W. Rathjens and Marvin M. Miller state,

> Almost 30 years ago, John Kennedy warned that the ability to produce nuclear weapons could spread to 10 countries by 1970 and perhaps 15 or 20 by 1975. "Horizontal" proliferation to this extent did not occur, in part because the world was divided into two power blocs. With the United States and the Soviet Union guaranteeing security within their alliances, other member states, aside from Britain, France, and China, felt little pressure to develop indigenous nuclear weapons programs.[31]

This bilateral power balance has been significantly altered with the dissolution of the Warsaw Pact and the disintegration of the Soviet Union. Those countries that were allied with the former Soviet Union no longer have an expressed nuclear guarantee, particularly when ethnic or national rivalries may pit these countries against one another or even Russia. These countries may have a strong interest in acquiring nuclear weapons to protect their own sovereignty. US allies, as well, may seek their own nuclear weapons to maintain insurance against regional powers who choose to acquire nuclear weapons. The previous section outlined numerous reasons that third world countries, who may not be allied with either the United States or the CIS, may seek to acquire nuclear weapons.

Up until the START II treaty, nuclear reductions have proceeded unilaterally and bilaterally between the United States and the CIS. These reductions assume a huge gap between the United States/CIS nuclear capability and that of other nuclear countries. Most Americans seem to view the START II limits on nuclear weapons as a sort of plateau, below which the United States should not venture without involving other nuclear nations. At lower nuclear weapon levels, strategists are concerned about five different categories of nations which will, or already have the potential to, affect the balance of power: (1) countries that have developed and

declared nuclear weapons; (2) countries that have built nuclear weapons but not declared them; (3) countries that have developed the capability to produce nuclear weapons but have stopped short of actually producing them; (4) countries that may soon develop the capability to produce nuclear weapons, either through indigenous effort or by purchasing technology and skilled labor; and (5) countries that may be able to bypass the developmental stage and directly purchase complete nuclear weapons.

Current Nuclear Countries

Currently five countries have declared their nuclear status—the United States, CIS, France, Great Britain, and China. Of these, the CIS clearly draws the most concern.

CIS. Unclassified estimates of the Soviet nuclear stockpile range from 25,000 to 32,000 weapons.[32] The United States was extremely concerned during the August 1991 Soviet coup attempt against Mikhail Gorbachev about the safety and security of the Soviet nuclear arsenal. The subsequent breakup and unstable economic conditions within the CIS further heightened US concerns about the possibility of nuclear weapons, nuclear technology, and nuclear scientists appearing on the underground market.

Barry Schneider, writing just prior to the Soviet breakup, suggests five major concerns regarding Soviet nuclear weapons: (1) the possibility of nuclear proliferation if the Soviet Union splintered into several smaller nuclear countries; (2) the possibility of nuclear weapons being sold or transferred to other nations or terrorist groups; (3) the possibility of nuclear weapons being used by republics and ethnic groups to achieve their goals or prevent interference from the central government; (4) the possibility that nuclear weapons may be used in a "use-or-lose" scenario in which Red Army troops face being overrun by superior numbers of local militia; and (5) the possibility that a republic or ethnic group may seize nuclear weapons to blackmail Moscow into not acting against their desire to secede.[33] Many of these concerns are still valid for the CIS. Schneider's first concern already has occurred—one nuclear state became four nuclear states—Russia, Belorussia, Ukraine, and Kazakhstan.

Even though the four nuclear republics have agreed to implement START and consolidate all strategic nuclear weapons under Russia, these republics have a long way to go before they achieve nuclear-free status. Much could happen during the interim—anything from reneging on the START agreement to nuclear civil war. In fact, as of March 1993, Ukraine remained the only party that had not ratified START I, refusing to do so without "security assurances from the United States and Russia."[34] Currently the Ukraine has

> 176 intercontinental ballistic missiles (ICBMs) (130 SS-19s and 24 SS-24s in silos) with 1,360 strategic nuclear warheads, Blackjack strategic bombers, and a few thousand tactical nuclear warheads. That is more than is presently possessed by Great Britain, France, China, and Israel combined. Kazakhstan has 104 heavy missiles (SS-18s) with 1,040 strategic warheads, Bear-H strategic bombers, and a substantial number of tactical warheads. This makes Kazakhstan the largest nuclear power in Asia apart from Russia.[35]

Sergei Rogov (deputy director of the Institute for the Study of USA and Canada, in Moscow) states that "with the passing of the cold war, policymakers and pundits in the capitals of the West have breathed a heavy sigh of relief"; however, those in Moscow "see all too clearly the prospects for chaos."[36] Writing after the formation of the CIS, he suggests three possible future paths for the CIS: (1) the formation of "a loose confederation" with military and nuclear forces remaining "under some form of central control"; (2) the formation of "a military and political alliance of independent states without a central government but with unified military forces"; and (3) "chaotic disintegration, a fragmentation of Soviet military power, and potential competition among new states." He contends that over the "long term," the probability of the last option occurring is "60 percent," considering the "ethnic conflict" and "competing territorial claims."[37]

Observers have voiced serious concerns regarding the security of tactical nuclear weapons, which may not be as carefully guarded as strategic weapons. Observers have estimated that as many as 5,000 tactical warheads are dispersed among eight non-Russian republics.[38] Rodman D. Griffin, writing for the *CQ Researcher,* states that there are about 15,000 tactical nuclear weapons in the former Soviet

arsenal. These weapons are stored at some 200 depots.[39] This situation presents a tremendous risk. There have been news reports alleging that Soviet weapons already have been sold to external agencies.

> *Corriere della Sera* reported in January that investigators had found documentary evidence about the sale of nuclear artillery shells from a Soviet base in Irkutsk. . . . *La Stampa* charged that Soviet officers have been selling tactical nuclear weapons to the mafia.[40]

Investigators are extremely concerned about the possible sale of nuclear materials as well. They seized a small sample of plutonium in northern Italy in October 1991 and 65 pounds of uranium in Zurich, Switzerland, in November 1991. They charged that both samples were produced in the Soviet Union and were bound for the Middle East.[41] "Germany alone is alleged to have carried out over 100 arrests associated with efforts to smuggle nuclear materials originating in the republics of the former Soviet Union."[42] Yossef Bodansky reported that:

> By the end of 1991, Iran had all (or virtually all) the components to make three operational weapons. . . . The weapons were assembled from parts bought in the ex-Soviet Muslim republics. These weapons can become operational as early as February to April 1992.[43]

The article provides a believable and detailed account of the interaction between specific individuals in Iran and Kazakhstan that was purposed to achieve an "Islamic bomb."

Robert M. Gates, director of the Central Intelligence Agency at the end of the Bush administration, attempted to defuse such reports while testifying before a Senate committee.

> We have seen a number of the press reports that Soviet nuclear materials have already been offered on the black market. Thus far, we have no independent corroboration that any of these stories are true, and all that we have been able to check out have turned out to be false. . . . We can expect to see many of these scams and hoaxes.[44]

Testifying before the Senate Governmental Affairs Committee on 24 February 1993, James Woolsey, new CIA director, agreed with Gates.

> So far, we have detected no transfers of weapons-grade material in significant quantities. We have no credible reporting that nuclear weapons have left CIS territory, and we do not believe that nuclear weapons design information has been sold or transferred to foreign states.[45]

Besides the potential loss of nuclear material and weapons, the United States has been concerned about Soviet nuclear-trained personnel selling their skills to third world countries who are willing to pay much higher salaries than the CIS can compete with. The 1991–1992 *Strategic Survey* states:

> Of most immediate concern are the thousands of scientists and engineers left with little work or pay after the collapse of the Soviet Union. The USSR employed some 100,000 people in nuclear weapons establishments. According to CIA Director Gates, approximately 1,000-2,000 have detailed knowledge of weapons design and 3,000-5,000 others were directly involved in related manufacturing processes. . . . Ex-Soviet nuclear weapons experts . . . report employment offers from Brazil, China, India, Iraq, and Libya, raising fears of an international auction for their talents.[46]

Reporting on the means by which Iran assembled its bombs, Yossef Bodansky states that "Iran recruited, for the construction of the weapons, some 50 experts and around 200 senior technicians mostly from the Kurchatov (Semipalatinsk-21) nuclear production plant in Kazakhstan." He continues that the experts are paid the United States equivalent of $5,000 per month and that Iran sought to hire senior nuclear scientists from the Kurchatov Institute in Moscow for the United States equivalent of $30,000 per month. Scientists in the CIS currently make about $5 per month.[47] A December article in the *Washington Times* reported that as many as 60 scientists from the former Soviet Union were being employed in India, Iraq, Iran, Brazil, and Pakistan, earning as much as $75,000 per year.[48]

The CIA also attempted to diffuse the brain-drain problem at the 24 February testimony by distributing a January 1993 Russian foreign intelligence (FIS) report. While acknowledging the existence of the problem, it stated:

> A comparatively small percentage of the many hundreds of thousands of specialists and scientists employed in the area of nuclear physics, chemistry, biology, and even missile building are privy to the secrets of designing, calculating, modeling, and assembling experimental and combat copies of WMD [weapons of mass destruction] systems.[49]

The report went on to say that the FIS had no knowledge that any of these specialists were working for third world countries.

One would hope that the CIA and FIS statements are absolutely true, but can the United States bet its national security interests on the inability of the CIA and the FIS to

confirm (at least publicly) the transfer of nuclear materials and scientists? And even if the CIA and the FIS reports are correct, what effect will they have on the Middle Eastern countries who believe that transfers have occurred?

China. China detonated a nuclear device successfully in 1964 but has not aggressively pursued the acquisition of nuclear weapons. Observers estimate that China presently possesses approximately 375 strategic nuclear weapons and 125 tactical warheads.[50] The launch capabilities of these weapons and warheads are limited to eight ICBMs, 60 IRBMs, and 12 SLBMs (one SSBN).[51] Additionally, they probably have some air-drop capability.

China has been a US concern with regard to proliferation. It has been a major supplier of conventional arms to the third world and has helped several countries establish nuclear research programs.[52] China joined the NPT in March 1992, which may help to alleviate US concerns over nuclear proliferation.

That China presently has a small nuclear arsenal may comprise only half of the story. China could have a significant amount of weapons-grade materials in storage for quick assembly into weapons. Additionally, it may have a significant production base for producing nuclear material.

At least three situations could cause China to consider increasing the size of its nuclear arsenal. First, Kazakhstan could decide to keep some number of nuclear weapons as opposed to becoming nuclear-free, which would greatly affect the balance of nuclear power within the region. Some individuals have voiced considerable concern regarding the possibility of Kazakhstan allying itself with other Moslem states. Second, tensions may rise again between India and Pakistan. Many analysts fear the potential of a nuclear arms race between these two countries. Should an arms race occur, China most likely would respond with weapons development as well. Third, North Korea's potential for nuclear capability, coupled with their development of longer range ballistic missiles, also may be seen as a threat by China.

France. France, although an ally and a member of NATO, has pursued a nuclear capability separate from NATO control since its first successful nuclear test in 1960. It joined the NPT in March of 1992. France also has adhered to a testing

moratorium since 8 April 1992 and has agreed to refrain from further tests, conditional on US and Russian refraining as well.[53] Currently, France has approximately 450 strategic nuclear weapons and 125 tactical weapons.[54] Besides nuclear-capable aircraft, France has six SSBNs (with a total of 96 launchers), 18 IRBMs, and 40 SRBM launchers.[55] In considering further drawdowns, observers certainly cannot consider French weapons additive in the sense of an alliance with the United States.

Great Britain. Britain became a nuclear power in 1952. It has approximately 275 strategic nuclear weapons and 100 tactical warheads.[56] Besides having nuclear-capable aircraft, Britain has launcher capabilities strictly in the sea leg. These capabilities are currently being upgraded, as the British are replacing four older Resolution-class SSBNs with four Vanguard and Trident SSBNs. Although Britain is part of NATO, the United States cannot assume that Britain will always side with the United States in the event of unilateral actions.

Current Nuclear-Capable and Undeclared Nuclear Countries

Perhaps even more dangerous than declared nuclear countries are those with undeclared nuclear weapons or those with the capability to assemble nuclear weapons quickly. Those countries are referred to as de facto nuclear countries.[57] While declared weapons and intentions provide a visible deterrent, undeclared capabilities leave open the whole realm of motives and possible actions. Three nations probably possess nuclear weapons but have chosen not to declare them—Israel, India, and Pakistan. South Africa recently declared that it possessed six nuclear weapons, but it has since dismantled them.[58]

India and Pakistan. The possibility of an arms race between India and Pakistan continues as a major concern to the United States. Gates testified:

> We have no reason to believe that either India or Pakistan maintains assembled or deployed nuclear bombs. But such weapons could be assembled quickly, and both countries have combat aircraft that could be modified to deliver them in a crisis.[59]

India tested a nuclear device in 1974 and declared it a peaceful demonstration. Analysts estimate that India may have enough materials to assemble from 40 to 60 weapons and may be working on developing thermonuclear capability. Pakistan may have obtained the capability to build a nuclear device in 1986. Analysts estimate Pakistan's capability ranges from five to 10 ready-to-assemble warheads.[60] Neither country holds a membership in the NPT.

Israel. As mentioned earlier, Israel has not declared its nuclear capability. Scientists believe that Israel achieved nuclear capability in the late 1960s. Mordechai Vanunu, an Israeli nuclear technician, released information regarding the Dimona nuclear weapons facilities, where he was employed from 1977 to 1985. Based on Vanunu's testimony, the *London Sunday Times* reported that Israel may have as many as 200 nuclear weapons. US officials stated that Israel's Dimona reactor could not have produced enough plutonium to support that many weapons and that Israel probably has only 50 to 60 weapons.[61]

South Africa. South Africa has had the capability to produce nuclear weapons since the early 1980s. Some analysts believe that it has stockpiled as many as 15 to 25 nuclear weapons.[62] South Africa joined the NPT in 1991 and agreed to International Atomic Energy Agency (IAEA) safeguards. South African President F. W. de Klerk's statement that all nuclear weapons have been dismantled seems to be somewhat substantiated by the IAEA, which declared that "115 inspections of South Africa's nuclear facilities revealed no evidence of incomplete information on its nuclear program."[63] However, dismantlement of the six declared weapons occurred in 1990, prior to its joining the NPT.

Developing Nuclear Countries

As already mentioned, the United States became preoccupied with the possible exodus of both nuclear materials and Russian scientists after the disintegration of the Soviet Union. The scientists could shave years off the time required for a country's research and development efforts to obtain a nuclear weapon. Additionally, many Americans are concerned about the potential sale of CIS nuclear weapons and material to third world countries. Third world countries

may bypass the indigenous development phase and simply purchase complete nuclear weapons. Robert M. Gates stated that "US or multinational forces deployed abroad could face an increased threat of air-delivered nuclear weapons before the end of the decade."[64]

Of particular interest to the United States is the loose alliance between North Korea, Iran, Libya, Syria, and Cuba. They formed this alliance in the early 1980s. These countries have provided a front "for the USSR in sponsoring terrorism and revolutionary warfare in return for a strategic umbrella *vis-à-vis* the United States." Two events have intensified efforts within the alliance to acquire nuclear weapons—the collapse of the Soviet Union and its nuclear umbrella over these countries and the Gulf War with the UN-imposed nuclear sanctions against Iraq.[65]

North Korea. North Korea signed the NPT in 1985 but refused to sign the IAEA safeguard agreement to allow inspection of its nuclear facilities. The United States and South Korea took several steps to apply pressure on the North Koreans. The United States removed all nuclear weapons from South Korea in 1991 and granted North Korea the right to inspect these facilities. South Koreans made a pledge to remain nuclear-free. North Koreans responded by signing a joint declaration on 31 December 1991 in which it agreed to "ban possession or development of nuclear weapons, and allow inspection of suspected nuclear weapons-related sites."[66] Both countries agreed to form a Joint Nuclear Control Commission in March 1992 to oversee the denuclearization of the Korean peninsula.[67]

North Korea has one operational reactor and another one under construction. It is estimated that the operational reactor can produce 14 pounds of plutonium annually and that the second could produce from 36 to 100 pounds annually. North Korea is also constructing a processing plant that could be used to turn the plutonium into a nuclear bomb. North Korean defectors have indicated the possibility of underground nuclear facilities, thereby posing the potential of another Iraq. Nuclear weapons deployed on Scud variants could threaten not only South Korea but Japan as well.[68] Japan stated that "Tokyo would not go through with its plan to award North Korea financial compensation related to the Japanese

occupation of Korea during World War II" if North Korea completes the construction of its "plutonium separation facility—even if operated under IAEA safeguards." This presents a double standard, since Japan maintains a plutonium-processing capability that North Korea contends is too large based on civilian needs alone.[69]

Although North Korea allowed some preliminary IAEA inspections beginning in 1991, it refused to allow inspectors to visit two suspicious sites at the Yongbyon nuclear complex in January 1993 and subsequently denied a request by the IAEA in February to perform a special inspection of the sites.[70] North Korea's actions have added to US concern that the North Koreans may be attempting to conceal a nuclear weapons program and are stalling until they achieve some minimal capability. James Woolsey testified that "North Korea has already manufactured enough fissile materials for at least one nuclear weapon."[71]

Iran. Iran signed the NPT in 1970 but nonetheless has been actively pursuing nuclear weapons. Iran signed a cooperative agreement with Pakistan in 1986 whereby Iranian nuclear scientists would receive training in Pakistan for Iranian financial support of Pakistan's nuclear program. Iran also received Pakistani help on the construction of a reactor in 1989.[72] Despite these activities, Woolsey testified that Iran would take "at least eight to 10 years to produce its own nuclear weapons"—but that time could be shortened with outside assistance.[73] As discussed earlier, Iran may have obtained nuclear materials from CIS sources. Tehran signed a nuclear cooperative agreement with Cuba in September 1991 and is committed to providing Syria with a nuclear umbrella once it obtains a nuclear weapon.[74]

Libya. Libya became an NPT member in 1975. It has made numerous attempts to purchase nuclear materials and elicit help for its nuclear programs. Libya is reported to have made several contacts in the CIS, but there have been no reports of success. M. Qadhafi believes that the coalition would not have attacked Iraq if Saddam had possessed nuclear weapons.[75]

Libya provides a significant amount of services and finances to the alliance. Bodansky states,

> In the mid-1980s, Libya established a wide network of front-companies and underground financing institutions which is being utilized for the illegal acquisition of Western technologies and equipment and their smuggling into radical states.[76]

North Korea has made extensive use of this network. In one instance, a sample of US zirconium was obtained via a West German company.

Syria. Syria, though having no nuclear program to speak of, has been actively seeking to establish one. It has sent individuals to France and other places for training, signed a cooperative agreement with India in 1981, and is working with China to purchase a research reactor.[77]

Cuba. Cuba is in the process of building two nuclear power plants. Cuba refuses to sign both the NPT and the Treaty of Tlatelolco.[78] This latter treaty declares that Latin America and the Caribbean are free of nuclear weapons. Cuba signed nuclear cooperative agreements with North Korea in February 1990 and with Iran in September 1991.[79]

While Cuba does not have an advanced nuclear program, it does have military expertise and hardware. Cuba maintains a wing of nuclear-capable MiG-23BN Floggers in underground shelters. The Soviets trained the Cuban pilots for low-level nuclear delivery missions in the United States.[80]

Argentina and Brazil. Argentina and Brazil have had nuclear research programs since the 1950s, although neither nation possessed operational nuclear reactors until the 1970s. Both countries achieved nuclear enrichment capabilities by the late 1980s.[81] Neither country has signed the NPT, viewing it as discriminatory and providing insufficient protection against nuclear attacks.[82] Argentina and Brazil did sign a mutual nuclear nonproliferation act in July 1991. This act not only declares that nuclear energy was designed for peaceful purposes, but it also bans nuclear testing and allows for joint monitoring of the two nations' nuclear facilities. The nuclear inspections agreement virtually parallels IAEA safeguards. Both Brazil and Argentina have signed the Treaty of Tlatelolco, but only Brazil has ratified it.[83]

Taiwan. Taiwan has a nuclear power program but does not have facilities to produce weapons-grade fuel. Although Taiwan signed the NPT in 1970, it built a secret lab in 1987 to

extract plutonium. Taiwan disassembled the facility, under US pressure, prior to its use.[84] However, any increase in perceived threat from China could prompt Taiwan to develop nuclear weapons.

Iraq. Patrick Glynn, a resident scholar at the American Enterprise Institute, asks the question that many other observers have pondered, "How did Iraq, a signatory of the 1968 Nonproliferation Treaty, manage to get so close to a bomb while ostensibly remaining under the treaty's 'safeguards'?"[85] Iraq ratified the NPT in 1969. Observers estimate that Iraq would have achieved a nuclear capability within six to 18 months of the Gulf War. US air attacks destroyed the majority of Iraq's nuclear facilities. UN Resolution 687 mandates that Iraq dismantle the remainder of its nuclear facilities. The real question now focuses on how long it will take for Iraq to reestablish those capabilities once UN members pull out. In the words of Jaffar Dhia Jaffar, Iraq's leading nuclear physicist, "You can bomb our buildings. You can destroy our technology. But you cannot take it out of our heads. We now have the capability."[86] Scientists believe Iraq could regain its nuclear infrastructure within a few years.[87]

Algeria. Algeria purchased a reactor from Argentina in 1985. Argentina required the 1MW natural-uranium reactor to be placed under IAEA inspection. It appears that this purchase was a deception plan to cloak the purchase of a larger reactor.[88] In 1991 the United States detected the construction of a second larger reactor through cooperation with China. Much secrecy surrounds this reactor, and the ring of antiaircraft missiles around it adds to US suspicions despite Algerian-announced peaceful intentions.[89] China claims that the reactor contract with Algeria was signed in 1983, prior to China's joining the NPT in 1984.[90] Scientists believe the reactor in Algeria can produce 12 pounds of plutonium each year.[91] Algeria agreed to IAEA inspections of the second reactor in February 1992; however, their intentions are still unclear.[92]

Others. Several countries have extensive ongoing nuclear research programs. Others have stockpiled large quantities of nuclear materials. Iraq proved that membership in the NPT and IAEA inspections are no guarantee that a country is not

developing nuclear weapons. Jennifer Scarlott states that the NPT has

> failed to prevent nations from acquiring the materials to abruptly opt for nuclear weapons at a time of their choosing. Belgium, Germany, Japan, and Switzerland are all stockpiling large quantities of plutonium and bomb-grade uranium, as well as the means to turn these materials into bombs.[93]

While such countries may have no current need to build nuclear weapons, regional instabilities and changes to the current alliance structure could spawn several new nuclear countries virtually overnight.

Chemical and Biological

In testimony before a Senate committee on 9 February 1989, William H. Webster, former director of the CIA, stated:

> Currently, we believe that as many as 20 countries may be developing chemical weapons; and we expect this trend to continue despite ongoing multilateral efforts to stop their proliferation. . . . We are concerned that the moral barrier to biological warfare has been breached. At least 10 countries are working to produce both previously known and futuristic biological weapons.[94]

While the literature agrees fairly consistently that 10 countries have engaged in biological weapons programs, it does not agree on the number of countries working on chemical weapons. James Kitfield, writing for *Government Executive,* states that "23 [countries] now have confirmed or suspected chemical warfare programs."[95] Many other authors suggest the number comes closer to 30. Denis Warner, writing for the *Asia-Pacific Defense Reporter,* contends that "no less than 38 countries are believed to have acquired chemical weapons, or to be seeking to acquire them."[96]

This analysis does not focus on the exact number of countries and capabilities. Whatever the real number may be, it is apparent that chemical and biological weapons are on the rise and pose a threat to regional security, particularly in the Middle East. Harvey McGeorge, chemical and biological warfare editor for *Defense and Foreign Affairs Strategic Policy,* states that "at least half of these nations began the acquisition process within the previous 15 years."[97] Onlookers have at

least four particular areas of concern regarding chemical and biological weapons proliferation among third world countries.

First, like the nuclear brain drain, Russian skills in chemical and biological weapons are marketable in the third world. On 15 January 1992 Robert M. Gates testified:

> A few thousand have the knowledge and marketable skills to develop and produce biological weapons. The most worrisome problem is probably those individuals whose skills have no civilian counterpart, such as nuclear weapons designers and engineers specializing in weaponizing CW and BW agents. They were treated well under the Soviet system and will find it hard to get comparable positions now.[98]

Second, chemical and biological weapons are much easier to produce than nuclear weapons and have proved to be quite effective. David Goldberg, a chemical weapons analyst for the Army, states that "it was not until World War I that chemical science and military technology had advanced so that chemical agent use could produce significant results." The Germans and Allies employed a total of 124,000 tons of chemical agents, resulting in 1.3 million casualties, of which 91,000 died.[99]

Currently, the 1925 Geneva Protocol bans the use of chemical and biological weapons in war. The ban has been ineffective mainly because

> the Protocol is, in effect, a no-first-use agreement, because many of the parties signed with the reservation that the Protocol was not binding if chemical agents were used by an enemy or its allies. Some reservations also made the Protocol nonbinding in the case of countries that are not a party to the Protocol.[100]

The Geneva Protocol has not prevented the use of chemical weapons in several conflicts. "There have been confirmed or alleged chemical agent attacks in 19 different countries in Europe, Asia, Africa, and the Middle East since World War I."[101] The Soviets incorporated chemical warfare into their military doctrine and employed chemical weapons during the invasion of Afghanistan. "Evidence compiled by the United States State Department in 1982 showed a minimum of 47 chemical attacks in Afghanistan, causing 3,042 deaths, although Afghan sources believe the figure was much higher."[102] The use of chemical weapons was widespread during the Iran-Iraq war. "Iran claims that in 242 attacks

between January 1981–March 1988 it lost 44,000 soldiers to CWs. . . . Between April 1987–August 1988 Iraq's Kurds claimed the Iraqi Army used CWs against their villages at least 200 times."[103] Additionally, use of chemical weapons by Vietnam, Angola, Mozambique, Ethiopia, and Libya have been asserted by opposing factions but thus far have not been proven.[104]

No agency or country has proven that biological weapons have been used in warfare. There have been numerous unproven allegations since the start of WWII. More substantial evidence exists for accidents that have occurred during biological research.[105]

The United States is working wholeheartedly toward a world-wide ban on chemical and biological weapons. Along with 129 other nations, the United States signed the Chemical Weapons Convention in Paris on 13 January 1993, pledging to destroy chemical weapons and chemical weapons production facilities. The 22-nation Arab League boycotted the signing to put pressure on Israel to sign the NPT. Despite the boycott, four Arab nations signed the treaty.[106] By February a total of 136 nations had signed the treaty, including four more Arab states.[107]

Will a chemical weapons ban work? Kathleen C. Bailey (vice president of National Security Research in Fairfax, Virginia) states that "a chemical weapons ban is essentially nonverifiable. . . . Chemical weapons are technologically easy to produce, inexpensive, effective in many scenarios, and difficult or impossible to detect." She also asserts that verification would be "extremely expensive."[108] Before a congressional committee, Webster offered the following testimony:

> Because much of the equipment needed to produce chemical warfare agents can also be used to produce legitimate industrial chemicals, any pharmaceutical or pesticide plant can be converted to produce these agents. A nation with even a modest chemical industry could use its facilities for part-time production of chemical warfare agents.[109]

Additionally, Geoffrey Kemp states:

> Although nuclear weapons remain in a class by themselves, the use of chemical weapons in the Iran-Iraq war and the low-keyed response of the international community have made them an attractive alternative to nuclear weapons for technically deprived countries wishing to develop military capabilities for both deterrence and war-fighting.[110]

Verification of biological weapons may be even harder. Dr Barry J. Erlick, a biological weapons analyst for the Army, states that "in November 1969, President Nixon unilaterally renounced the United States offensive biological warfare program and, three months later, renounced toxins as a method of warfare."[111] Additionally, the "development, production, and stockpiling of biological and toxin weapons is prohibited by the 1972 [Biological and Toxin Weapons] Convention. . . . However, it does have a large loophole in that research is not banned, leaving a thin line between offensive development and defensive research."[112] Again, Webster testified:

> The equipment to produce biological warfare agents is truly dual-use in nature. With currently available technology, biological warfare agents can be produced at such a rate that large stockpiles are no longer necessary. There are no precursor chemicals or equipment that can be used only for the production of biological warfare agents. Actually, any nation with a modestly developed pharmaceutical industry can produce biological agents if it chooses.[113]

Third, if a ban is unobtainable, or unverifiable, can the use of such weapons be deterred? Historians espouse that Hitler was deterred from using chemical weapons in WWII due to the vulnerability of German cities to reciprocal Allied air attacks. Many historians have asked the question, "Why didn't Saddam use chemical weapons in the Gulf War?" Some observers have speculated that it was for the same reason—Iraqi cities were totally vulnerable to coalition attacks. Others suggest the ambiguity of President Bush's threats left open the possible use of nuclear weapons in retaliation. Kathleen C. Bailey suggests three other possible reasons: Saddam lost communications with his troops due to effective US air strikes; Saddam perceived a low utility in chemical attacks due to coalition forces being equipped with gas masks; or Soviet advisers may have counseled/pressured Saddam into not using chemical weapons.[114] Whatever the real reason, a deterrent equation cannot be extrapolated from the Gulf War.

Fourth, chemical and biological weapons pose a significant, lethal threat. James Smith states that biological weapons

> have limited battlefield utility though their effects can be short-lived and indiscriminate. Strategically they do have some potential, but contagious diseases or contaminated water supplies would pose

> extreme problems for any conventional follow-on attack. . . . The greatest threat biological weapons pose is as a terror weapon.[115]

Chemical weapons are more suited for battlefield use than biological weapons are, since military personnel can control their effects and distribution to a greater degree. The utility of employing chemical weapons against troops that are equipped with protective gear would be limited. Other than casualties from equipment failure or improper use, the main usefulness gained in employing chemical weapons would be the effect in slowing an army's rate of advance and the psychological effect on troops operating in such an environment. So chemical weapons, too, pose the greatest threat as weapons of terror.

To use biological and chemical weapons to terrorize another nation's civilian population, a nation must have a relatively long-range delivery capability. Artillery and battlefield rockets are not sufficient to threaten population centers without invading the country. And while aircraft certainly can deliver these weapons, the most feared delivery method—which makes them truly weapons of terror—is the ballistic missile.

Ballistic Missiles

As illustrated during the Gulf War, conventionally tipped ballistic missiles are not much of a military threat, particularly when they are as inaccurate as the Scud. Since they are not reusable, ballistic missiles are an expensive means for delivering conventional weapons. In contrast, aircraft can carry significantly heavier payloads and are reusable. Most third world ballistic missiles carry no more than 500 to 1,000 kg payloads. "The payload of a single F-16 is equal to that of four Scud-B missiles."[116] When weapons of mass destruction are delivered by ballistic missiles, the inaccuracy and cost issues become much less significant.

As it did for other technologies, the United States is attacking the missile proliferation problem through supply controls. "The MTCR prohibits the sale of missiles that exceed 180 miles in range and 1,100 pounds in payload; it also restricts transfers of the technologies to produce them, from space launch vehicles to rocket engines."[117] The case of Iraq

demonstrates that when given a basic missile, a nation can use indigenous research and development to increase its range. Like other dual-use technology, space launch programs offer an inherent military ballistic missile capability. Of the seven countries that have placed satellites into orbit, only Japan has not manufactured ballistic missiles as well. Beside India and Japan, which have launched satellites, eight other third world countries have ongoing space programs.[118] "The space organization GLAVKOSMOS has reorganized to market a joint Russian-Kazakhstan space launch service, and Russia is offering SS-25 boosters as space launchers."[119] And not all countries are agreeing to MTCR controls. According to Reginald Bartholomew (under secretary for international security affairs during the Bush administration), North Korea is still "exporting complete MTCR-class missile systems."[120]

Denis Warner states that "23 different countries have acquired ballistic missiles. . . . Seventeen of the 23 ballistic missile countries are in the Third World, nine of them in the Middle East."[121] An important issue is not merely the purchase of missiles by third world countries, but their acquiring the technology to build them indigenously. Appearing before the Senate committee in 1989, Webster testified that "by the year 2000, at least 15 developing countries will be producing their own ballistic missiles. . . . Many countries where these missiles are being developed are in the Middle East."[122]

Lora Lumpe (a research analyst at the Federation of American Scientists, in Washington, D.C.), Lisbeth Gronlund (an SSRC-MacArthur fellow at the Center for International Security Studies, University of Maryland, College Park), and David C. Wright (an analyst at the Union of Concerned Scientists, Washington, D.C.) contend that of the countries possessing ballistic missiles only China and Russia have the range capability to target CONUS and, with the exception of Saudi Arabia, Israel, Britain, and France, the other nations have ballistic missiles with ranges of under 500 km. Furthermore, they contend that with the exception of space launch programs by Japan, India, and Brazil, no country will develop a capability to reach CONUS by the year 2000.[123] However, Gates stated, "I think that we do anticipate that at least some [third world ballistic missiles] will have the

capability of reaching the United States by the end of the decade [2000]."[124] While the capability of targeting CONUS with ballistic missiles presents a serious challenge, the major threat for the 1990s will continue to be regional stability.

Dr Martin S. Navias (a research associate in the Department of War Studies, King's College, London) suggests that countries in the Middle East may soon upgrade their ballistic missile capability to be able to target Europe.[125] While several countries employ the Scud B with a range of approximately 300 km, the Iraqis modified the Scud B to achieve a range of 600 km. Additionally, Saudi Arabia acquired the CSS-2 from the Chinese with a range of 2,500 km, and Israel's Jericho 2 is believed to have a range of 1,500 km.[126] Egypt, Iraq, and Libya have all been actively seeking longer range ballistic missiles. Egypt and Iraq were working with Argentina to develop the 1,000 km Condor 2, but that program was subsequently canceled—which was touted as an MTCR success.[127] W. Seth Carus (Olin Fellow at the Naval War College Foundation in Newport, Rhode Island) states that with a 1,000-km range, Libya could reach targets in Italy, Greece, Turkey, Egypt, and Israel.[128] India has tested several ballistic missiles, including the Agni, which has a 1,500-mile range and could deliver a nuclear weapon to Beijing.[129]

Future Potential Scenarios

While observers may find it difficult to determine what the future may hold for US conflicts, they may categorize potential threats and targets for not only discussion purposes but also for analyzing shortfalls in US capabilities to meet the threat. The following table captures the spectrum of potential scenarios. The table can be summarized by a series of questions:

1. What weapons of mass destruction are involved?
2. What delivery capability does the enemy possess?
3. Is the threat potential or actual?
4. Who is being threatened by these weapons?

Weapons of mass destruction have been a primary concern throughout this paper. Table 10 shows these weapons as possible choices for several potential threat scenarios. Since it is impossible to capture the range of possible scenarios in a table or a graph (column 1 alone would require a three-dimensional graph to capture the possibilities simultaneously), the table should be thought of in terms of a spectrum of possibilities. Column one represents the weapon threat spectrum. A nation may possess one weapon of mass destruction of one type or may possess a significant number of any combination of the three types.

Table 10

Possible Future Weapons of Mass Destruction Threatening US National Security

Types of Weapons	Delivery Means	Types of Threats	Target
• Nuclear • Chemical • Biological	• Artillery • Airdrop • Ballistic missile • Covert • Cruise missile • Rockets	• Presence • Threatened use • Actual use	• US territory • US military alliances • US regional interests in the third world • Global peace/regional stability • Overseas US facilities • Deployed US and allied forces

Column two lists a variety of potential delivery means for these weapons. When weapons of mass destruction are discussed, authors almost unanimously assume a ballistic missile threat. This certainly is not the only means of delivery, but it is clearly the one of most concern for regional conflicts.

Although terrorism has not materialized to the fullest extent possible, it could still become a real problem for the United States. Whereas a surprise ballistic missile attack from the Soviet Union was the most feared threat during the cold war, the threat of a covert weapon of mass destruction delivered by a terrorist looms as one of the most feared threats today. The

attack on the World Trade Center building (in New York) in March 1993 heightened fears among Americans of the possibility of terrorist attacks. Although the attack was conducted with conventional high-explosives, weapons of mass destruction can be small and thus portable, making them easy to smuggle into a country.

Artillery weapons are easy to produce. Numerous artillery-delivered chemical weapons were employed in the conflict between Iraq and Iran. President Gorbachev promised to destroy all Soviet nuclear artillery shells in his 5 October 1991 speech; however, there is no guarantee that some nuclear artillery shells will not be smuggled out of Russia before their destruction can occur. Gates testified that the Russians have the capability to dismantle approximately 1,500 warheads per year. "At that rate it would take well over 10 years to dismantle the 15,000 weapons they say they will destroy."[130]

Such US high-tech weapons as cruise missiles will not be easily manufactured in a third world country, but cruise missile technology may be available from Russian scientists for a price. Robert M. Gates testified:

> We may also see leakage of highly sophisticated but less controlled conventional military technologies and weapons from the former Soviet republics. Technologies of concern include stealth, counterstealth, thermal imaging, and electronic warfare. Weapons could include fuel-air explosives, precision-guided munitions, and advanced torpedoes.[131]

The third column in the table represents a spectrum of possible conditions that may confront US national command authorities. A nation may simply acquire a particular weapon of mass destruction with a crude delivery capability, which may upset a regional balance of power. A state may threaten to use a weapon of mass destruction to advance its cause or thwart attempts from outside interference. And finally, a country may actually use weapons of mass destruction in a conflict.

The fourth column lists possible targets for weapons of mass destruction that are US security interests. The United States mainland has been free from assault since the Civil War. Many Americans take this apparently secure tranquillity for granted. Currently, only Russia, Ukraine, Kazakhstan, and China can reach the United States with a ballistic missile. The advent of

more countries acquiring ballistic missile and space assets increases the vulnerability of the United States to outside attack. Third world countries could target CONUS with their shorter range ballistic missiles simply by launching them from ships.

With the collapse of the Soviet Union, many world leaders have voiced increasing concern about rising regional instabilities formed by the lack of Soviet influence. In many ways the bilateral standoff between the United States and the Soviet Union produced a stabilizing influence on the world. Without that balance, aggressive third world leaders may seize opportunities to increase their regional dominance or settle old territorial or ethnic disputes. US interests and allies will continue to be threatened by regional conflicts. The United States *National Security Strategy* fully recognizes this fact and focuses attention on these potential problems.

Most future regional conflicts will not be of the same magnitude as the Gulf War, yet the United States will continue to face guerrilla insurgencies, terrorism, and civil wars in many regional conflicts. Regional conflicts may involve two countries but certainly may involve more than that.

The closure of some overseas bases and the reduction in numbers of US personnel deployed on foreign soil will not reduce the potential danger to US bases and personnel. If anything, the continued anti-American sentiment, coupled with a weaker overseas presence, may increase the potential for attacks on bases and personnel.

In addition to the possibility of several conditions within table 10 existing simultaneously (i.e., more than a single type of weapon or delivery capability), other conditions may develop over time. For example, a conflict may escalate from purely conventional to use of chemical and/or biological agents as the war drags on. In the face of sure defeat, a nation may employ nuclear weapons as a last-ditch effort. Conversely, a nation may be concerned about a preemptive strike by high-tech conventional weapons and may choose to employ weapons of mass destruction early in the conflict to respond to what they consider a use-or-lose scenario. A nation may chose to use weapons of mass destruction at the outset of hostilities for their shock value alone.

Table 10 fails to capture two additional factors. First, leadership mental state—is the enemy leadership rational or irrational? Classifying Saddam as an example of an irrational leader, observers ask, "What will the United States do in future conflicts when it faces undeterrable leaders?" Assuming a pure difference between rational and irrational produces two cases for table 10—one for the rational leader and one for the irrational one. In reality, rationality is relative. The United States has been guilty of overlaying the American mind-set on its enemies in the past. Unfortunately, an action that is irrational to US thinking can be perfectly reasonable to the enemy leader.

Second, table 10 fails to capture the particular source, type, and size of the conflict. Regional conflicts have numerous possible dimensions. The details of how the conflict started, who is involved, and the magnitude of the conflict will affect how the United States chooses to respond. The following partial list of types of activities (and to some degree, type, and size) could all involve the release of weapons of mass destruction:

- Terrorist activity
- Guerrilla activity
- Coup attempt
- Civil war
- Bilateral conflict
- Regional conflict

US nuclear weapons may play an important role in protecting US national security interests in several other special case scenarios. The following is a sampling:

1. The United States has announced its intention to develop GPALS as a means of protection against a small number of ballistic missiles—on the order of two hundred. The presence of GPALS could motivate US leadership to develop a "no-first-use" nuclear strategy. Having a limited number of ballistic missile assets, the next obvious step would be for a potential enemy to develop an effective countermeasure to GPALS. An effective countermeasure coupled to a belief that the United States would not launch on warning could lead an enemy to launch a preemptive attack against the United States. Such an imbalance would force the United States to

return to the nuclear alert posture of the cold war, where deterrence consisted of survivable nuclear assets.

2. While precision-guided munitions can destroy a host of targets, conventional weapons cannot sufficiently destroy all targets. A hardened target may require several conventional weapons to ensure its destruction. Super hard targets, in all probability, cannot be sufficiently damaged by conventional weapons. The tremendous success of precision-guided munitions in the Gulf War was largely due to the coalition's total air superiority. Future conflicts may not afford that luxury. Even in the Gulf, not all precision weapons hit their targets. In some cases, a near miss may not be tolerable. For example, in carrying out a preemptive strike against a hardened nuclear silo or a ballistic missile shelter, a near miss might evoke a nuclear response from the enemy.

3. Desert Storm taught another valuable lesson to future US enemies—it takes a considerable length of time for US transportation assets to build up sufficient forces within the theater of operations. With the reduction in US overseas presence and overall force strength, the United States will find it even harder to respond to future scenarios—at least of the magnitude of Desert Storm. Approximately 90 percent of the cargo transported to and from Saudi Arabia went by sea. US sealift occupies its lowest strength level since WWII. There was no submarine threat during Desert Storm. Future conflicts may not have as benign a sea threat as during Desert Storm.

Tactical nuclear weapons played an important role in NATO doctrine when forces faced a potential Soviet/Warsaw Pact overrun. The potential for US and allied forces to be overwhelmed by superior strength and numbers may increase as the United States continues its military drawdown. In the future, deployed US/allied troops may face certain conventional defeat against an enemy that has local air superiority and/or an effective submarine capability against US transport ships. In such instances, tactical nuclear weapons may be the only US choice to prevent US/allied troops from being overrun.

4. Desert Storm was truly the first "space war." Satellites provided data for navigating, targeting, weather forecasting, missile warning, communicating, and intelligence gathering as

never before. The presence of a similar capability by Saddam would have greatly affected the coalition's ability to execute Gen Norman Swarzkopf's "Hail Mary" play. And while the war emphasized the importance of space assets to future wars, it also provided a lesson about the need to remove an enemy's ability to use space to his advantage. The Russians currently have an antisatellite (ASAT) capability. Future enemies also may develop ASATs. While the United States has many ongoing research and development programs in the area of directed energy and kinetic energy weapons, it may need to rely on nuclear weapons to deter attacks against space assets or to destroy enemy satellites.

5. The heavy dependence of the industrial world on electronics makes it extremely vulnerable to a nuclear weapons effect known as electromagnetic pulse (EMP). In recent years, the United States military has concentrated large amounts of money in hardening certain systems against EMP. Still, many systems are not hardened against EMP, and the actual susceptibility of hardened systems has never been tested, only simulated, due to the banning of above-ground nuclear tests.

A future enemy may seek to damage electronic systems and shut down key communications systems by launching an EMP attack by detonating several high-altitude nuclear bursts above the United States. An enemy may calculate that the United States would not respond with nuclear weapons, since it is not being directly attacked. Such an attack could be the front end of a nuclear attack, the precursor to a conventional attack, or perhaps an action by a third world leader to "get even" for some US intervention. US nuclear weapons may have a role in deterring such actions.

Some of the scenarios presented here may seem far-fetched; others may be all too real. The ability of the United States and/or the United Nations to deter the use of weapons of mass destruction in such scenarios or to terminate hostilities with minimal damage from weapons of mass destruction is certainly not clear-cut. The United States must plan a course of action for future scenarios in which proliferation is a given. While it is impossible to consider every permutation of each possible scenario, the United States must possess sufficient

capability to deter any rational leader from using weapons of mass destruction against the United States and its allies, and its forces must be flexible enough to provide the national command authorities with the widest range of responses to an irrational leader who tests the resolve of US leadership. The next chapter examines the capability of current US forces to perform these two missions.

Notes

1. Traditionally, nuclear force structure planning has been based on damage estimation (DE). DE is calculated by using probabilistic computer models to determine the level of damage a particular force structure can be expected to inflict on a predetermined target set. Force structures are evaluated on their ability to achieve a certain level of DE against each of the four classes of Soviet targets—nuclear, other military, war supporting industry, and leadership.

2. Joint Chiefs of Staff, *National Military Strategy of the United States* (Washington, D.C.: Government Printing Office, 1992), 3.

3. Ibid., 4.

4. Although nuclear weapons may still play a role against an overwhelming conventional threat, this analysis does not examine worldwide conventional capabilities to speculate on possible regions where such a condition might occur.

5. President George Bush, *National Security Strategy of the United States* (Washington, D.C.: The White House, January 1993), 16.

6. Richard Cheney, "U.S. Defense Strategy for an Era of Uncertainty," *Defense 92*, 7.

7. President George Bush, *National Security Strategy of the United States* (Washington, D.C.: The White House, August 1991), v.

8. George Bush, State of the Union Address delivered to Congress on 28 January 1992, in *Washington Post*, 29 January 1992, 14.

9. 1991 *National Security Strategy*, v, 2.

10. Mariam Aftab, "The New World Order: A Critical Evaluation," *Strategic Studies* 14, no. 3 (Spring 1991): 54.

11. 1991 *National Security Strategy*, 26.

12. Jennifer Scarlott, "Nuclear Proliferation After the Cold War," *World Policy Journal* 8, no. 4 (Fall 1991): 697.

13. A. Z. Hilali, "Arms Control in the Third World," *Strategic Studies* 14, no. 3 (Spring 1991): 72.

14. Geoffrey Kemp, "Regional Security, Arms Control, and the End of the Cold War," *Washington Quarterly* 13, no. 4 (Autumn 1990): 47.

15. Ibid., 45.

16. Aaron Karp, "Controlling Ballistic Missile Proliferation," *Survival* 33, no. 6 (November/December 1991): 529.

17. Stephen Budiansky et al., "The Nuclear Epidemic," *U.S. News & World Report*, 16 March 1992, 40.

18. Yossef Bodansky, "Radical States and Nuclear Proliferation: Racing to the Finish," *Defense and Foreign Affairs Strategic Policy* 19, no. 6 (Winter 1991–1992): 12.

19 Douglas M. Johnston, "Defense Strategy in an Uncertain World," *World & I* (May 1992): 28.

20. Bodansky, 10.

21 George W. Rathjens and Marvin M. Miller, "Nuclear Proliferation After the Cold War," *Technology Review* 94, no. 6 (August/September 1991): 30.

22. Ibid., 27.

23. Yahya Sadowski, "Sandstorm with a Silver Lining? Prospects for Arms Control in the Arab World," *Brookings Review* 10, no. 3 (Summer 1992): 11.

24. Ibid.

25. Scarlott, 702–3.

26. Janne E. Nolan, "The Politics of Proliferation," *Issues in Science and Technology* 8, no. 1 (Fall 1991): 64.

27. Andrew Hull, "The Role of Ballistic Missiles in Third World Defense Strategies," *Jane's Intelligence Review* 3, no. 10 (October 1991): 465.

28. Ibid., 470.

29. Steve Fetter, "Ballistic Missiles and Weapons of Mass Destruction: What is the Threat? What Should be Done?" *International Security* 16, no. 1 (Summer 1991): 9–10. He notes that such rates would be a rare special occurrence. His analysis, based on fairly rough data, shows that even at a range of 500 km per sortie, aircraft attrition would have to exceed 35 percent before it would be more economical to employ ballistic missiles.

30. Barry Schneider and Larry Fink, "A Deadly Game of Hide-and-Nuke," *Defense and Diplomacy* 9, no. 7 (July/August 1991): 14.

31. Rathjens and Miller, 25.

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Chapter 5

US Nuclear Forces for the Post–Cold War Era

Thus far, this analysis has examined the role of US nuclear weapons in a historical context, defined the current role of nuclear weapons as detailed by the national security and military strategies, described the wide range of opinions within the literature regarding future roles for nuclear weapons, and discussed potential threats with particular emphasis on weapons of mass destruction. This chapter analyzes the ability of US nuclear forces to meet national security objectives in light of potential threats, projected nuclear reductions, and curtailment of nuclear modernization and research and development programs.

Post–Cold War Environment

The post–cold war era provides an opportunity for an eased nuclear posture, nuclear arms reductions, military downsizing, and perhaps a more stable security environment through multinational cooperation in the areas of arms control, nonproliferation, and security agreements. These opportunities have become US policies and are basic to the national security strategy yet are not an end in and of themselves. They are merely tools to achieve the distant goal of world peace, which is a condition upon which the four enduring US national security objectives can flourish.

The START agreement, President Bush's and Gorbachev's unilateral initiatives, and the START II agreement are steps to reduce the size of US and CIS nuclear arsenals and presumably to posture nuclear forces in a safer, more secure, and more stable manner. The condition that must be avoided at all costs is political myopia, which calls for military downsizing without connectivity to national security objectives.

Newspapers, periodicals, books, congressional hearings, and television have become a national forum to answer the question of How low can we go? Unfortunately, all too often, the connectivity of forces and force structure to national security objectives gets lost in the exuberance of achieving a "peace dividend" in the absence of any real near-term threats. Besides recommending arbitrary reductions in nuclear weapons, many of these articles and studies make dangerous generalizations. For example, the National Academy of Sciences Committee on International Security and Arms Control (CISAC) reported:

> U.S. national security can be greatly increased if nuclear forces are substantially reduced, drastically beyond those levels now foreseen in START or that will result from the unilateral withdrawals and reductions contemplated by the Soviet Union and NATO.[1]

Such a sweeping generalization leads the public to believe that "less is better" and draws attention away from national security to drastic reductions in the levels of nuclear weapons. When this occurs, reducing the size of the United States and CIS arsenals can become the end, rather than the means to achieve the end.

To answer the How low can we go? question, a more basic question must be answered: How does one identify the threat (present and future), measure current military capabilities against the threat, identify excesses and deficiencies in those capabilities, and make decisions on what capabilities to acquire or dispose of?

The post–cold war era has made the task of defensive planning a difficult one to say the least. Planners must start with national objectives, develop a suitable strategy to accomplish those objectives in light of the current and projected threat, and then define a force structure that will support the strategy. Without a specifically defined threat, force structure requirements become relative.

President Bush's unilateral initiatives are two perfect examples of this problem. Other than stating that the risk of a Russian attack on the United States is lower than during the cold war, Bush made no connectivity between the proposed nuclear weapons and delivery systems reductions and the need for deterrence delineated in the United States national

security and military strategy. Neither was any qualitative rationale provided to the American people as to why 20 B-2s, 18 Tridents, 500 MM IIIs, and an unspecified number of B-52Hs adequately meet the requirement for deterrence under START II.

In the face of Clinton administration conventional force reductions, nuclear weapons could return as an important means of assurance. The United States may once again find itself in the same position as it did after WWII when it increasingly employed nuclear weapons to make up the difference between US and Soviet conventional capabilities. Russia, too, with many economic woes, may have to rely more on the power of nuclear weapons as opposed to the large conventional force structure it can no longer afford. Having viewed with substantial concern the tremendous success of US technology in the Gulf War, Russia may view nuclear weapons as the only means of maintaining parity with US high-technology weapons.

While some Americans advocate that nuclear weapons should no longer be used to deter the use of chemical or biological weapons or to hedge against an overwhelming conventional attack, the significance of reducing the size of the United States military coupled to such a policy change has not been explored. Riding the crest of Desert Storm, many US military and civilian analysts think future conflicts will be won quickly, with minimum loss of life, through use of conventional high-tech weapons. They view the United States as being the sole remaining superpower, capable of gaining United Nations support to legitimize coalition offensive action against would-be aggressors. While the United States has always favored the employment of technology to save American lives on the battlefield, the tremendous success of high-tech conventional weapons as perceived through the eyes of the public media may be giving the American public a false sense of security.

What happens when nonproliferation efforts fail and the adversary not only has weapons of mass destruction but threatens to use them? Given the narrow margin of the Senate's vote on going to war in the Gulf (52-47), how successful would President Bush have been in obtaining the Senate's endorsement of military action had Iraq possessed nuclear weapons? Furthermore, how successful would the UN

be in building a coalition? How many countries would readily join a coalition against an aggressor that possesses the capability of delivering nuclear, chemical, or biological weapons? And even if the aggressor cannot target members of the coalition directly, how would a coalition respond to threats against a third-party nation such as Saddam's attacks on Israel in the Gulf War?

These issues present US policymakers with a real dilemma. On one hand, the United States can seek to achieve multinational action against aggression whenever possible, yet retain a strong military posture to act unilaterally whenever multinational consensus cannot be reached or US leaders disagree with the consensus. On the other hand, the United States can surrender some of its military strength and rely entirely on multinational consensus to deal with future conflicts. If history is any indicator, US security interests will continue to be challenged by other countries regardless of the size of the United States military. While a weaker military posture will make it harder for the United States to respond to future threats, maintaining a strong military posture will be declared hegemonic by countries who disagree with US policies.

Possible US Responses to Proliferation

Proliferation can be stopped theoretically by either eliminating the supply, eliminating the demand, or eliminating both. Currently, US nonproliferation efforts focus predominately on the suppliers. The United States has spearheaded efforts to consolidate suppliers under the banner, "It's not in the world's best interest for us to indiscriminately sell weapons and technology." If suppliers agree not to sell technology or hardware to buyers, nonproliferation will succeed—that is, until a demander offers enough under-the-table money to offset the supplier's reluctance. And even if suppliers cannot be bribed, technology can be obtained through research and development or espionage, and hardware can be stolen. Supply-side efforts will inevitably fail.

By concentrating its efforts predominately on suppliers, the United States has little recourse when supply controls fail. US

actions to date have been little more than a "slap on the wrist" comprised of "embarrassment" by the media and political denouncements. In some instances, proliferation will be the result of a corporation selling its wares without the consent of its country's leadership. In these cases, little can be done other than to demand that judicial action be taken against the corporation. The damage, however, already will have been done—the gaining nation will have the technology in its possession.

What about demand control? Demand control involves the proverbial carrot and stick approach.

Carrots

Carrots are an extension of political favor through alliances, promises, and goodwill. By extending its nuclear umbrella through alliances, the United States may dissuade nonnuclear countries from pursuing nuclear weapons. It is not likely that the United States will extend its nuclear umbrella for chemical and biological threats as well. Although the promise of an overwhelming US conventional response may satisfy some third world leaders, others may want their own chemical and biological weapons for deterrence and retaliation should deterrence fail.

A potential drawback of alliances is that the American public has been increasingly less tolerant of the perceived useless spillage of American blood on foreign soil to enforce US foreign policy. Fighting another country's war will not sit well with many Americans. The post–cold war era may see an increasing reluctance from Americans to get involved with another country's regional disputes.

US promises complement the alliance approach. The United States has promised not to use nuclear weapons against nonnuclear states. In some ways this pledge is both a security guarantee and an unspoken stick as well. Inherent in the promise that the United States will not attack nonnuclear states with nuclear weapons is the negative message, "If you obtain nuclear weapons and go to war against the United States, you are not exempt from nuclear attack."

Goodwill includes bestowing political prestige, economic trade, and foreign assistance programs in exchange for

militarily good behavior. The problem with assistance programs is that they require tax dollars for support. Third world countries may subtly bribe the United States by continuing to up the ante for not pursuing weapons of mass destruction programs. At some point the United States may be forced to call someone's bluff.

Carrots will work only when a country is not fully convinced that it desires weapons of mass destruction. What if a country's desire for weapons of mass destruction is stronger than its desire for carrots? What does the United States do in the case of countries that it chooses not to ally with and extend the nuclear umbrella to? In these cases the United States must resort to the stick approach.

Sticks

The stick approach involves three progressive steps: inspecting to ensure that technology and hardware are not acquired; policing to remove any materials (short of actual weapons) found to be in violation of treaties or policies; and acting to remove weapons should they be manufactured or acquired. The latter two procedures may involve political, economic, or military measures or any combination of the three.

A major problem of verification inspections is the tremendous cost involved. US leadership faces critical choices during these times of budget drawdowns. President Bush stated that the United States does not wish to be the world's policeman. An inspection program that requires the United States to supply a large percentage of dollars and manpower may not receive strong congressional support.

A second major problem with the stick approach is that, except in the case of voluntary cooperation, it involves the violation of a sovereign state's rights. To date, most arms control measures, short of war, have involved the voluntary cooperation of states. The nonproliferation efforts outlined in chapter 2 conform to this approach. A state may voluntarily elect to participate in opening its doors to surveillance and intrusive inspection, but what about those who refuse? Does the UN have the right to override state sovereignty to remove technological capabilities or actual hardware that seem to threaten? To date, such action has been endorsed only after a

major war; for example, the Treaty of Versailles, which stripped Germany of tanks, aircraft, artillery, and poison gas. Iraq is the first instance of a UN-endorsed action against weapons of mass destruction. UN Security Council Resolution 687 specifies the "supervised destruction of Iraqi nuclear, chemical, and biological weapons," as well as missile capabilities with "long-term monitoring of compliance."[2]

In the future, when a country is suspected of developing or of actually possessing weapons of mass destruction, will the UN sanction political, economic, and military action (if required) to enforce inspections and/or removal? If the UN will not assume such a responsibility, the world will certainly face countries acting unilaterally, such as Israel's attacking the Iraqi Osirak reactor in 1981.

The Gulf War provided the United States with an excuse to attack Iraqi nuclear production sites. Some analysts have estimated that Saddam was within a year of obtaining a nuclear weapon. Had the Gulf War not occurred, would the United States have performed a surgical strike to eliminate Iraq's nuclear capability? The United States *national security strategy* avows that the United States will continue to act unilaterally when it is deemed a matter of US security interests.

The United States established a new precedent on 17 January 1993. US Navy vessels launched 45 Tomahawk cruise missiles at an Iraqi facility that produced electromagnetic isotope separation components for Iraq's uranium enrichment program.[3] While these actions were taken to enforce the UN's right to inspect nuclear facilities, they mark the first time the United States has attacked a nuclear facility during peacetime.

Such offensive military actions as the Israeli and US attacks on Iraqi nuclear facilities without prior political dialogue will erode the credibility of nonaggressive nonproliferation regimes. Jennifer Scarlott asserts that "the United States finally dropped all pretense of having a coherent nonproliferation policy" by attacking Iraq's IAEA nuclear facilities during the Gulf War. In essence she argues that the United States has set itself up to assume a leading role in "the fight against aggression and instability around the world."[4] The danger of military action is that it may encourage further proliferation. States may opt for nuclear weapons as security against such

raids. Additionally, the threat of strikes may force nuclear weapons programs "further underground" to ensure their survivability against military action.[5]

US and UN experiences in Iraq bring to light two important issues that illustrate a third major problem of the stick approach—finding a country's assets, whether it be for inspection or destruction purposes. First, the United States had tremendous difficulty in finding and destroying mobile Scud missiles. While processing facilities are relatively large and stationary, weapons can be concealed virtually anywhere. Second, although Iraq is a member of the NPT and was subject to IAEA inspections, it was able to develop undetected nuclear processing facilities and, by the estimates of some inspectors, was perhaps within a year of developing a nuclear weapon.

A fourth major problem with the stick approach looms quite large. Research and development and dual-use technologies virtually permit a country to possess the pieces necessary to build a weapon of mass destruction without actually having a weapon. Peter A. Clausen, a director of research for the Union of Concerned Scientists, illustrates this problem in the case of nuclear technology. He states that there is not "a clear boundary between nuclear and nonnuclear status." This gray area is due to the fact that building nuclear weapons requires several technologies and subprocesses. A country may possess the ingredients to assemble a bomb but may choose not to actually perform the last step. Additionally, actually testing a weapon, particularly a simple fission weapon, is no longer necessary, thus adding to a country's ability to conceal its capabilities. Clausen states that the "lack of a clear boundary . . . is partly responsible for the international community's inability to respond coherently to the undeclared nuclear powers."[6]

Clausen suggests three possible approaches to the problem of proliferation by asking, "Should energies be directed at reversing the process, holding the line against further moves up the proliferation ladder, or smoothing the entry of de facto weapon states into the nuclear club?"[7]

Eliminating the Threat. One of the most likely US responses may be to persuade a country that has acquired weapons of mass destruction to give up its capability. Such an

action is called a rollback. Before resorting to the stick approach, the United States may choose the alliance approach, as discussed earlier. Thus, the United States could offer security guarantees to the proliferator in exchange for its relinquishment of weapons. Of course, such an option is not without economic burden either. The United States would most likely have to offer money and perhaps manpower to disassemble and clean up the nuclear facilities.

On the other hand, the United States may not want to extend its nuclear umbrella in exchange for a small rudimentary nuclear capability. Furthermore, numerous countries are seeking nuclear capability for which the United States would not even think of extending any security guarantees. Such countries require other rollback options.

Political denouncement and economic sanctions are often exercised as a US expression of disapproval. The United States may be successful in obtaining UN backing and multilateral sanctions against a country. As history has shown, however, political denouncement and economic sanctions do little to achieve the ultimate goal. Armed conflict is almost always required.

If the United States views the newly acquired capability as a threat to regional security, it may consider offensive action to remove the capability. This action may emanate from a UN sanction and could involve multilateral forces. The danger of this approach is that it is overt and would most likely be countered by threats to use weapons of mass destruction against attacking forces or neighboring countries that voted for the action. The possible threat of weapons of mass destruction certainly would hinder efforts to build coalition forces and could hamper the sanctioning of action by countries that are located within striking range.

Covert action or a preemptive strike most likely would provide the best opportunity to remove the capability—with the greatest success and with the least danger to the forces involved. The major problem with surgical or preemptive strikes is the possibility of retaliation. Libya's launching of two Scud-B missiles at the US installation on the island of Lampedusa in retaliation for US raids on Tripoli in 1986 offers a perfect example. Qadhafi stated that had he possessed

missiles that could reach the United States, he would have attacked New York with nuclear weapons.[8]

W. Seth Carus states that "almost certainly, the fear of Libyan attacks would cause many US allies to distance themselves from the United States, especially if the missiles were to be armed with chemical weapons."[9]

Deterring the Threat. Deterrence is the most likely US response to proliferation of weapons of mass destruction. With the renouncement of biological and chemical weapons, US deterrence is limited to the threat of either conventional or nuclear retaliation. The *National Military Strategy* states that US nuclear weapons will continue to provide a deterrence against attack from weapons of mass destruction. Yet, the credibility of US nuclear response to a chemical or biological attack increasingly is being called into question. The use of conventional precision-guided munitions in lieu of nuclear weapons has been widely discussed for responses to such scenarios but has not been advocated as an official US declaratory policy.

The ability of US nuclear weapons to deter the use of third world nuclear weapons also is being called into question for at least two reasons. First, many observers feel that the United States would not use nuclear weapons against a third world country. If a third world leader also holds this belief, he might detonate a nuclear device against the United States or its allies believing that the United States will not respond with nuclear weapons. Lewis A. Dunn (assistant director of the United States Arms Control and Disarmament Agency from 1983 to 1987 and now an assistant vice president of Science Applications International Corporation) suggests that while "the design of a credible declaratory policy raises difficult choices . . . there are good arguments for an 'assured nuclear second use' declaratory policy."[10]

The deterrent value of a declaratory policy needs to be heavily weighed against the potential that the United States could back itself into a corner. Having promised a nuclear response, the president may decide in a particular situation that it is not in the best interest of the United States to so respond. For example, suppose Saddam had had one confirmed nuclear device at the start of Desert Storm.

Furthermore, suppose he had launched it on a Scud, but because of the Scud's lack of accuracy, it caused minimal damage. In this instance, the United States, believing that Saddam had no more nuclear weapons, might have decided to maintain "the high moral ground" and not respond "in kind," but rather to retaliate with overwhelming conventional force.

Refusing to respond in kind may send mixed messages. On the positive side, it may strengthen the confidence of world leaders in the US desire to maintain a high-nuclear threshold. On the negative side, some leaders (potential nuclear possessors would be of concern) may perceive it as a lack of US resolve to respond with nuclear weapons, and they could subject the United States to another test of that resolve.

Dunn argues that there are "moral considerations ('not killing innocent civilians'), political arguments ('likely loss of international support'), and geopolitics ('avoiding a further weakening of the nuclear taboo') [that] would all argue against nuclear rather than conventional retaliation."[11] The United States has two difficult choices. First, if the United States were to respond with a nuclear device, what size device should it use? Second, what target would the United States use it against? Even if the international community supported nuclear retaliation to teach an aggressor a lesson or two, the United States most assuredly would be criticized if it responded with too large a weapon or killed "innocent civilians."

A second criticism of deterrence theory is that it may not be valid for certain third world scenarios. The United States and the Soviet Union had more than 40 years to work out the relationship between nuclear weapons and deterrence. Developing nuclear nations do not have the benefit of such a mature relationship. Americans typically view third world leaders as undeterrable; that is, many third world leaders would risk US nuclear response for a prestigious place in history and the afterlife.

Defending against the Threat. Thus far, the only solutions posed to the undeterrable leader problem are overwhelming punishment of the enemy and GPALS. Overwhelming punishment does not offset the potential large loss of lives at the hands of weapons of mass destruction. GPALS, if

developed and deployed with a high probability to intercept an incoming missile, will help deter a ballistic missile attack as well as provide a degree of security against such an attack. GPALS also may alleviate the problem of attempting to find mobile missiles before they are launched. But, as noted earlier, GPALS offers only a potential solution to a limited ballistic missile attack. It will not protect against chemical artillery shells, nuclear bombs, or biological contamination from terrorists.

GPALS poses another potential dilemma. No system can offer complete protection. What if a country shoots a ballistic missile at the United States and that missile is successfully intercepted? What then? Will the United States shoot back to teach that country a lesson? Or will it warn once, twice, or perhaps three times before shooting back? Perhaps the NCA would consider a conventional rather than a nuclear response. Precision conventional munitions can be targeted against nuclear sites, and even if some miss their targets, GPALS will save the day. Or will it? Suppose GPALS has a 90 percent intercept-and-kill probability and today happens to be your unlucky day. How much of a chance will the NCA take on a nuclear weapon detonating over a large US city?

Perhaps the most feared threat in America today is that weapons of mass destruction will fall into the hands of terrorists. A terrorist is not deterrable and is almost impossible to defend against. A terrorist does not need a ballistic missile to deliver a bomb—and even if state-sponsored, the terrorism may not be traceable to a state for punitive action. The threat alone of a chemical, biological, or nuclear bomb planted in a major US city would be enough to cause injury and death from the panic-stricken exodus it would create. An actual bomb that was intercepted successfully by authorities would cause tremendous panic and upheaval in this country. An actual detonation would become a nightmare.

Beyond terrorism, Qadhafi stated that he would have retaliated against the United States with nuclear weapons for the raid on Tripoli. Is it implausible to think that North Korea and Iran may supply Cuba with nuclear weapons, once they obtain the capability, to be delivered by Cuban nuclear-capable aircraft to selected targets in Florida? And that a

single nuclear bomb could be dropped on Orlando (Disney World or Sea World) in retaliation for aggressive US action in the Middle East?

To date, the United States has done little more than attempt to hold the line against further proliferation. As discussed earlier, this action may have delayed proliferation, but it will not prevent it. The United States has neglected announcing any long-term nonproliferation policy. How is the world to perceive this ambivalence? If actions speak louder than words, acquisition is okay as long as one doesn't get too aggressive (as Saddam did).

Acceptance

A third approach, which is rarely discussed in the literature, is simply "live with it." Stephen Budiansky states:

> America and its allies may be facing a painful choice: either use military force to prevent North Korea and others from going nuclear, or learn to live in a world in which nearly every nation that wants nuclear weapons has them.[12]

Such an approach assumes a state's right to sovereignty. In the case where supply controls fail, the United States could extend a "welcome-to-the-club" hand.

A key criticism of the acceptance approach is that the probability of weapons of mass destruction actually being used increases with the number of states possessing them. Robert Art (Christian A. Herter professor of international relations at Brandeis University and a research associate at Harvard's Center for International Affairs), speaking specifically about nuclear weapons, suggests five factors that would tend to increase the probability of nuclear use:

> First, new nuclear forces are not likely to be as secure from preemptive attack as those of the mature nuclear states. Consequently . . . states might be tempted to launch preemptive first strikes against an adversary's nuclear forces. . . . Second, command and control arrangements in new nuclear states are not as likely to be state-of-the-art. Consequently, the chances for unauthorized or accidental use will be greater. Third, many would-be third world nuclear states do not have governments as stable as those of the mature nuclear powers. Consequently, this increases the risk that their nuclear weapons could fall into the hands of sub-national groups waging civil war, or terrorist groups taking advantage of political

> chaos. Fourth, many third world would-be nuclear states are involved in implacable confrontations in which reason and restraint have been far less prevalent than they have in U.S.-Soviet relations. . . . Fifth, for the case of nuclear terrorism, the argument is both simple and terrifying: terrorists are not 'deterrable,' only suicidal.[13]

Rather than expending large amounts of money to stop proliferation, the United States could set up programs to help countries learn to be responsible owners, sharing valuable command and control information and providing training in security and safety. A policy of acceptance may act to surface undeclared weapons and see that modern safety and security devices are installed, which, some would argue, produces a more desirable end than the current risk involved with undeclared weapons. Acceptance may be passive or active.

Passive Acceptance. Passive acceptance amounts to either no public reaction from national leaders or political denouncement with no further actions needed. The biggest problem with passive acceptance is that it conveys a message of either US apathy or US acceptance. Some nations have criticized the United States for turning a blind eye to Israeli and Pakistani nuclear programs. This lack of response delivers a message of prejudice to the rest of the world—that the United States is interested in preventing proliferation only in the case of certain countries. Such impressions will only fuel the fires of proliferation. Lack of US reaction also seriously undermines the nonproliferation efforts that are currently in place. Analysts contend that US willingness to turn a blind eye to proliferation by Israel and Pakistan "has had a significant ripple effect in eroding the credibility of the NPT regime."[14]

Active Acceptance. The United States has much to gain by maintaining a friendly relationship with new nuclear countries. Acts of goodwill may offset a previously adversarial relationship. US assistance in the area of training, security, and command and control would make that country's capability safer and more stable than it would be without US assistance. Additionally, acceptance is a positive approach which, coupled with other acts of political goodwill, could aid in the establishment of new alliances and ensure that the newly acquired weapons would not be used against the United States.

The Role of US Nuclear Weapons

Before one can analyze forces, one must establish what US nuclear weapons will be required to do in the post–cold war era. Without a coherently stated mission, it is impossible to trace a clear and logical flow from the intended purpose of nuclear weapons through the acquisition process to the deployment of a force structure intended to meet that mission. Chapter 2 notes the absence of any real change in national-level guidance regarding the role that nuclear weapons should play in achieving national objectives—despite the substantial size reduction in the military, the major change in military posture from overseas forward basing to stateside reactionary basing, the major reductions in nuclear armament under President Bush's unilateral initiatives and START II, and the significant change in nuclear force posture under the unilateral initiatives.

Yet, the 1993 version of the *National Security Strategy* hints that a changing role for US nuclear weapons may be on the horizon. While the document continues to stress the value of modern strategic nuclear forces for deterring nuclear attack, it fails to even mention nonstrategic nuclear weapons. The 1991 *National Security Strategy* defined the role of nonstrategic nuclear weapons as highlighting US resolve, linking "conventional defense to the broader strategic nuclear guarantee" and "ensuring that there are no circumstances in which a nuclear response to military action might be discounted."[15] Was this omission an oversight, or is the newer *National Security Strategy* quietly suggesting that nonstrategic nuclear weapons no longer have a role in the post–cold war era? Or is the latter version purposefully blurring the distinction between strategic and tactical nuclear weapons? And does the omission of mentioning nuclear weapons as a means to deter chemical and biological attack or as a response to an overwhelming conventional attack denote a move away from nuclear weapons in these roles?

A Declining Role?

Chapter 3 provided a sampling of opinions concerning the future role of US nuclear weapons. On one end of the spectrum

are those observers who advocate a nuclear-free world. On the other end are those that continue to advocate an offensive nuclear posture to guard against a resurgent Soviet threat. In between are many realists who reject the notions of a possible nuclear-free world one day and the reemergence of the Soviet threat in the near future. These realists contend that nuclear weapons should be used only to deter nuclear attack.

Several action officers in the Pentagon suggested that the United States is indeed moving toward a position that nuclear weapons are for deterrence only—that the United States will not actually use nuclear weapons in war. Some of these officers went on to say that had Saddam possessed and used nuclear weapons in the Gulf War, the United States would have maintained the "high moral ground" and retaliated with overwhelming conventional forces. A white paper written by AF/XOXI reinforces this belief. It states:

> In the future, the United States may have the option of retaliating with means other than nuclear weapons, even in response to attacks with nuclear weapons, thus enhancing the prospects of controlling further escalation. Retaliating with advanced conventional weapons, or defending against an attack with ballistic missile defenses, will both be more credible and will allow the United States to maintain the moral high ground, at least in conflicts short of direct nuclear attacks on US territory.[16]

This position is potentially a dangerous one. While such a position advocates the maintenance of a high "nuclear threshold," it strikes at both the will of the United States to use nuclear weapons and the credibility of US commitment to its allies.US refusal to retaliate in kind against a nuclear attack could well open the door for further testing of US resolve.

The 1992 *National Military Strategy* clearly articulates a position toward the other end of the spectrum. It defines the purpose of nuclear forces as "to deter the use of weapons of mass destruction and to serve as a hedge against the emergence of an overwhelming conventional threat."[17] With the elimination of biological and chemical weapons, the United States has left itself with only two options for responding to weapons of mass destruction. While the United States will most likely continue to rely on nuclear weapons for deterrence against weapons of mass destruction, what clearly is missing

from both the national security and military strategy documents is any declaration of US intention to actually use nuclear weapons or a statement of conditions that may evoke a US nuclear response.

Warfighting and Deterrence

By the end of the cold war, nuclear strategy had evolved from massive retaliation to flexible response, in which the United States possessed a wide range of nuclear forces which provided the national command authorities with the ability to respond to any level of conflict. As late as 1990, Gen John T. Chain, commander of Strategic Air Command, spoke of the need for nuclear weapons to "deter throughout the potential range of deterrent scenarios—from normal day-to-day through the brink of nuclear war—yet allow [for] effective warfighting should deterrence fail and nuclear war ensue."[18] With the passing of the cold war, public discussion of actually employing nuclear weapons also has passed.

Chapter 3 discussed the "usability paradox." To deter the use of nuclear weapons, countries must make nuclear weapons usable but not so usable that someone could launch them accidentally or without proper release authority. Usability is only one-half of the deterrence equation. Leaders also must display a willingness to employ nuclear weapons if they are to be a credible deterrent. By taking nuclear bombers off alert, placing tactical nuclear weapons in storage, committing to a significant reduction in the number of nuclear weapons, and canceling nuclear weapon modernization programs, President Bush sent a cogent message to the world of US intentions to move away from the heightened nuclear posture under the cold war. At the same time, his actions reduced the usability of nuclear weapons and indicated a lessening of US willingness to actually employ them. Decreasing both the number and posture of US nuclear weapons in a manner commensurate with the decrease in the Soviet/CIS threat was an appropriate action; however, the United States must guard against lowering the deterrent *value* of its nuclear forces. The way that the United States maintains, advertises, modernizes, and postures its nuclear weapons will affect their deterrent value directly. As stated by

President Bush, the world is still a dangerous place. In the estimation of some analysts, the world is more unstable than it was during the cold war. Thus, nuclear weapons may play an even more important role in the post–cold war era.

President Bush's unilateral initiatives emphasized nuclear reductions while failing to stress US willingness to regenerate nuclear forces. The *National Military Strategy* seems to clarify this matter tactfully by stating, "The President's September 1991 nuclear force initiative was *intended* [emphasis added] to enhance our security through arms reductions while preserving the capability to regenerate forces if required."[19]

Without a statement that US nuclear forces will be smaller, yet flexible, and capable of responding to any threat that the NCA deems worthy of a nuclear response, nuclear weapons will begin to lose their deterrent value. Lowering deterrent value affects not only US security but nonproliferation policies and alliances as well. The United States may be communicating an actual or perceived message to the world that the United States no longer has the resolve to employ nuclear weapons in a war-fighting sense. Such a perception could encourage a hostile nation to challenge US resolve to use nuclear weapons. If alliances perceive a decrease in US will to employ nuclear weapons, they may be tempted to procure their own nuclear weapons for protection.

So, despite the reduced defense budget, nuclear modernization and careful force posturing may be the best investments the United States can make to provide a believable deterrent through usable nuclear forces. Nonproliferation advocates may attack such a position as one that encourages other countries to acquire weapons of mass destruction to counter US capabilities, which will, in turn, spurn regional arms races. But as discussed earlier, proliferation is a given. Third world countries will seek to acquire weapons of mass destruction for the numerous reasons detailed in chapter 4. The 1993 *National Security Strategy* acknowledges this fact and stresses a nonproliferation policy that is aimed at limiting proliferation. With such an approach, the United States must adopt a clear nuclear policy to accomplish national security objectives while planning options for US confrontations with proliferators.

Unlike the cold war nuclear relationship with the Soviet Union, the post–cold war environment promises uncertainty and unpredictability. Flexibility holds the key to dealing with this uncertainty. US nuclear strategy must be capable of holding at risk that which is deemed valuable by other nations—to one leader, it may be population; to another, it may be military forces.

In the case of third world nations that are not deterrable in the traditional sense—that is, they would have every intention of employing weapons of mass destruction in a conflict—the United States will need to rethink its war-fighting strategy. When US strategists came to the realization that nuclear war with the Soviet Union was not winnable, the United States adopted a flexible response strategy with emphasis on controlling escalation short of total annihilation. However, the United States should not seek to apply this strategy to third world countries that have a dissimilar view. The United States may need to explore a dual strategy—a continued war-fighting strategy to deter CIS aggression and a war-winning strategy for "nondeterrable" third world countries. A war-winning strategy would ensure that the United States retains sufficient offensive capability to soundly defeat any third world aggressor and sufficient defenses to protect the United States and its allies from weapons of mass destruction. The United States would achieve deterrence through a US nuclear "second use" declaratory policy—namely, that any use of weapons of mass destruction employed against the United States and its allies will be met with swift nuclear retaliation from the United States.

US Defense Strategy

Nuclear policy should clearly parallel the new US defense strategy of strategic deterrence and defense, forward presence, crisis response, and reconstitution. Deterrence of nuclear attack based on a highly capable triad has been the cornerstone of US defense strategy for more than 30 years. Even with the end of the cold war, the triad will continue as the fundamental element of the United States strategic deterrence equation. Nuclear weapons must maintain the capability to deter across the full spectrum of possible

conflicts. GPALS has been added recently to the strategic deterrent strategy to guard against the accidental or unauthorized launch of a ballistic missile and to defend against actual attack by a small number of ballistic missiles.

The forward basing of US nuclear weapons in Europe provided a credible deterrent through the flexible response strategy. Nuclear weapons deployed on ships and submarines also provided a decided forward presence. President Bush's initiative to bring these weapons back to CONUS was warranted under the decreased threat from the former Soviet Union. His move also provided a greater degree of security for US tactical nuclear weapons. Forward basing is not necessary to deliver nuclear weapons in a crisis. US long-range bombers can deliver air-dropped nuclear weapons anywhere on the globe in a matter of hours. These unilateral actions eliminated the deterrent value provided by forward-based nuclear weapons. The physical presence of these weapons, even if not visible, provides a statement of the will of the United States' to use them if necessary. Even if the United States will to use nuclear weapons has not changed, CONUS basing will lower the deterrent value of tactical nuclear weapons in the eyes of an enemy.

Since nuclear weapons no longer will be forward-based, the United States should be ready to deploy tactical nuclear weapons to positions of forward basing in cases of heightened tensions. The mere open redeployment of these weapons would serve to highlight US resolve and provide a visible deterrent against the use of weapons of mass destruction. On the negative side, redeployment could be seen as an act of aggression by other nations and could elicit such an undesirable response as the early use of their weapons of mass destruction in what they may consider as a use-or-lose scenario that was precipitated by the presence of US nuclear weapons.

In view of the crisis response strategy, nuclear weapons must be rapidly deployed and flexibly targeted. Deterring the use of weapons of mass destruction during peacetime may be achievable with a minimal number of strategic nuclear weapons on alert. Deterring weapons of mass destruction during time of crisis and crisis-response actions requires a

greater range of flexibility and visibility than that provided by strategic missiles. Deterring weapons of mass destruction during conventional war is the most challenging of all. A nation must combine its offensive actions, political policies and statements, and nuclear capability to convince the enemy that it will meet any use of weapons of mass destruction with immediate retaliation to cause unacceptable damage.

Reconstitution means that should the CIS refuse to comply with START or START II or should another nuclear arms race ensue, the United States is fully ready to respond. US intelligence sources are vital to this strategy. Intelligence estimates must provide enough warning time to allow for adequate reconstitution.

Although the United States has a large number of nuclear weapons in storage, US nuclear weapons production facilities would be a key element should reconstitution be necessary. President Bush announced US intentions to cease production of weapons-grade plutonium and uranium.[20] While these materials can be removed from older warheads and reused, the ability of the United States to process plutonium pits for nuclear weapons was obstructed when Rocky Flats was ordered closed in 1989 because of safety and environmental concerns. Due to its relatively short half-life, tritium production would be required to reconstitute stored warheads. US production of tritium also was halted with the shutdown of the Savannah River nuclear plant in 1988. Considerable congressional and public debate has ensued concerning the reopening of these plants, due to both environmental concerns and the lack of perceived need with the tremendous drawdown under START II. These debates have not been resolved to date.[21]

Arms Control and Acquisition Policy

During the cold war, the United States based the acquisition of new nuclear weapons and delivery systems on the Soviet threat. Now that the Soviets no longer provide the basis for nuclear weapons requirements, how does the United States identify necessary capabilities? Maintaining parity with the CIS during the nuclear weapons drawdown serves as a sufficient near-term measuring stick, but at some point the United States also must consider the capabilities of other

nations. The *National Security Strategy* recognizes this issue and asks, "How does the proliferation of advanced weaponry affect our traditional problem of deterrence?" In addition, it also asks, "How should we think about these new military challenges and what capabilities and forces should we develop to secure ourselves against them?"[22] However, the document does not provide answers to these questions.

The new national defense strategy must account for developing third world capabilities in light of two distinct, yet interrelated, policies. First, US arms control policy must account for the effects of other countries and alliances. While the United States and the CIS can comfortably reduce nuclear and conventional forces bilaterally, both countries must consider the capabilities of other nations at some point. These capabilities should define a lower limit in disarmament levels. Additionally, US arms control policy must consider defense capabilities that are no longer needed in the context of a CIS confrontation but might prove useful in the multilateral realm. Second, US acquisition policy not only must consider ways to replace aging systems and provide new and better technology, but also must plan for new defensive capabilities needed to deal with the complex realm of a multipolar environment. Most importantly, these two policies must function together. The United States cannot afford to destroy old capabilities in the name of disarmament before new ones are ready.

A Hedge against Uncertainty

The *National Security Strategy* states, "It is our responsibility as a government to hedge against the uncertainties of the future."[23] Hedging requires an understanding of what future role the United States will play in world affairs. It also requires an evaluation of the spectrum of hostile scenarios in which the United States might find itself engaged. The United States intends to remain engaged in regional problems around the world. President Bush stated, "America must possess forces able to respond to threats in whatever corner of the globe they may occur."[24] The *National Military Strategy* states:

> Into the foreseeable future, the United States and its allies, often in concert with the United Nations, will be called upon to mediate economic and social strife and to deter regional aggressors. As the only

> nation with the military capability to influence events globally, we must remain capable of responding effectively if the United States is to successfully promote the stability required for global progress and prosperity.[25]

To respond to uncertain future events effectively, the United States must maintain forces that can provide US leadership with the flexibility to respond to the full spectrum of possible scenarios. (Chapter 4 outlined the spectrum of possible scenarios involving the use of nuclear weapons.)

Unilateral Capability

As stated by both the national security and military strategies, the United States plans to act within the realm of the multinational security environment. Thus, whenever possible, the United States will act in conjunction with other nations. However, when such action is not possible, the United States will maintain the capability to act unilaterally.

This issue becomes extremely important when one considers further nuclear reductions. In fact, further reductions should require that other nuclear powers reduce the size of their arsenals. Paul Nitze feels that the United States arsenal should remain comparable in size and capability to that of the CIS and should maintain a strategic reserve that is as large as the sum of other strategic arsenals combined. This strategy is necessary to hedge against any possible changes in the current nuclear alliance structure and to prevent domination by another nuclear power in the aftermath of a nuclear exchange.

The START II agreement makes this outcome an impossibility for at least two reasons. First, START II maintains parity between the United States and the CIS. The United States cannot maintain parity with the CIS and at the same time keep additional strategic nuclear weapons to account for current and developing nuclear countries. Second, START II counts all bomber nuclear weapons.[26] This new rule eliminated the United States advantage in maintaining a large number of bomber weapons, which served as a hedge against the failure of a ballistic-missile triad leg and provided a viable strategic reserve. At lower numbers, the United States will find it increasingly difficult to maintain a secure strategic reserve

equal to the sum of all other strategic weapons. For example, the strategic arsenals of Great Britain, France, and China would mean a strategic reserve of approximately 1,100 weapons. As other countries build or acquire ICBM capability, they will cause this number to increase. The acquiring of long-range bomber capability or SSBNs by other countries also would affect this number.

Chapter 3 also pointed out that some blurring is occurring in the distinction between tactical and strategic nuclear weapons. US tactical nuclear weapons could figure into the equation of maintaining some sort of strategic reserve. The key is not so much numbers of weapons as it is survivable weapons. US tactical weapons are not currently survivable, since they are being stored at nuclear weapons storage sites. The only survivable weapons the United States currently has postured are SLBM weapons, which are to be scaled back to no more than 1,750 under START II. Future arms reductions will most assuredly reduce this number, if not actually ban MIRVed SLBMs.

The importance of these issues runs much deeper than a purely analytical number count. The presence of massive strategic arsenals by the United States and Soviet Union allowed for some "bullying" to take place in the aggressive actions of both countries. In the shadow of the massive US and Soviet arsenals, the arsenals of China, Great Britain, and France were insignificant as far as alliances were concerned. As the numbers of nuclear weapons decrease, alliances will become increasingly more important and may tip the scales of nuclear balance. In a START II environment, if all nuclear countries in the world were to ally with the CIS and protest against US unilateral action, the United States would most likely be dissuaded from continued action.

An Analysis of Nuclear Force Capabilities

Though the cold war has ended, the fact remains that the best defense is still a good offense. No defensive system can offer absolute protection against ballistic missile attack, and ballistic missiles are by no means the only way to deliver

weapons of mass destruction. Deterring weapons of mass destruction in the post–cold war era requires nuclear forces that can respond across the spectrum of possible scenarios. The following list offers some nuclear force characteristics that help to provide this capability:

- quick response
- positive control
- decisive firepower
- precision accuracy
- minimum collateral damage
- flexible employment options
- wide range of weapon yields
- high probability of kill
- demonstration of capability
- show of force
- crisis stability
- survivability
- visible generation
- hedge against uncertainty

These characteristics would provide a capable and visible deterrent to any aggressor who contemplated the use of weapons of mass destruction. These characteristics also would provide US national command authorities with the qualities that US forces will need to respond at any level of conflict. These capabilities also would give the NCA the ability to negotiate from a position of strength when the NCA wants to roll back another nation's acquired capabilities, the precision to remove a capability if negotiations fail, and a force to deter, retaliate, and punish the enemy. In addition, such capabilities would provide a good reason for nations to accept the United States nuclear umbrella when it is extended. Finally, if a nation acquires nuclear weapons and the United States chooses to acknowledge that nation as a nuclear power, the capabilities listed above would provide leverage to impose safety and security measures on that nation's nuclear arsenal.

Quick Response

The strategy of crisis response and reconstitution, relying heavily on the reserves, is a return to the minuteman philosophy

of the American Revolution. The United States is putting much faith not only in its intelligence-gathering sources but also in its leadership's ability to accept indicators and warnings and take prompt action. The basis of this strategy centers around the enemy's belief that the president would respond to a crisis *promptly*.

US nuclear forces must be able to respond quickly to a rapidly escalating regional conflict, especially in cases where the NCA fears that a nation may use weapons of mass destruction in a preemptive role or at the outset of the conflict. Obviously, ICBMs provide the fastest response; however, their present yields may be too high for third world targets, and their present guidance systems may not provide enough accuracy for low-yield nuclear weapons. Some strategists have proposed using ICBMs to deliver conventional warheads. Although new guidance systems and warheads (nuclear or conventional) could be installed on a few ICBMs for such missions, the use of ICBMs causes some additional concerns. The United States would have to notify the CIS of its intentions to launch nuclear-tipped ICBMs to avoid the CIS perception that the attack was aimed at them. Additionally, use of conventional warheads would require strict separation of systems and tightly controlled verification procedures to provide assurance that an announced conventional attack was not a US deception for the delivery of nuclear weapons.

SLBMs provide the next fastest response, but they suffer from the same drawbacks as the ICBMs. Additionally, they would not be useful in their START II MIRVed configuration unless the NCA chose to deliver several warheads to a particular region. Of course, one or two missiles per submarine could be reconfigured to perform a low-yield nuclear or conventional attack.

To avoid broadcasting missile launch intentions, the B-2 bomber would provide the best platform for worldwide delivery, surprise, and accuracy. In some instances, however, a bomber may take too long to reach its intended target. US intelligence agencies may fail to provide the NCA with enough tactical warning to allow bombers to reach their targets in time. Since President Bush did leave an air-delivered nuclear capability in Europe, some quick-response tactical capability will remain.

The majority of US tactical nuclear weapons have been stored and will be unavailable for quick response. Deploying tactical weapons requires a significant period of time. Aside from transportation and handling, unless ships and aircrews maintain current nuclear certification, a much longer lead time will be necessary to recertify personnel for nuclear weapons.

Positive Control

While it is desirable to have rapid response, it is imperative also to maintain positive control over nuclear forces so that nuclear weapons are not launched without proper release authority. The United States command and control system has provided a high degree of control through the history of the United States nuclear weapons program. Perhaps one of the biggest dangers faced from new nuclear powers is a lack of a sophisticated system to control their nuclear weapons.

Crisis Stability

Crisis stability became a key focal point of arms control discussions with the Soviet Union. The United States position is that silo-based ICBMs are destabilizing, particularly highly MIRVed ICBMs, since they are vulnerable to a preemptive strike unless launched upon warning of an incoming nuclear attack. Since missile flight time is approximately 30 minutes, a leader does not have much time to make a decision. Such a hair-trigger posture created fears throughout the cold war that an erroneous warning of an imminent or actual nuclear attack could cause a leader to launch his ICBMs and start World War III. Additionally, the advent of the MIRVed ICBM made a preemptive strike more tempting, since the attacker could possibly destroy a large number of ICBM warheads on the ground in exchange for a much smaller number of his own warheads. Arms control talks focused on ways to counter the destabilizing nature of such systems. START limits the total allowed number of ballistic missile warheads to 4,900. START II limits the total number of MIRVed ICBM warheads to 1,200 initially and totally eliminates MIRVed ICBMs by the year 2003. Additionally, START II limits the number of SLBM warheads to 1,750 by the year 2003.

While these two arms control treaties have moved toward a more stabilizing ballistic-missile posture, they have succumbed to several decisions that have run counter to the stability logic under arms control negotiations and the START agreement. First, the START II treaty allows SLBMs to remain MIRVed. While this posture may not seem destabilizing by itself, it could prove to be destabilizing in the future. The United States has always sought to maintain a relatively balanced triad as a hedge against failure or a technological breakthrough that would prevent a leg of the triad from performing its mission. The United States START II posture is extremely SLBM-heavy. With a total of only 18 submarines carrying at least one-half of the United States strategic arsenal, a future enemy can focus the majority of his research and development on antisubmarine warfare (ASW). Any technological breakthrough in ASW that would render US submarines easier to kill would be destabilizing, especially since the remainder of US ballistic missiles will continue to be silo-based and easily targeted.

Second, the START II treaty allows the CIS to deploy mobile ICBMs at the START limit of 1,100. President Bush made the decision to cancel both Peacekeeper Rail Garrison and SICBM programs, so US ICBMs will remain in silos. The idea behind Rail Garrison and SICBM was to provide survivability. Rail Garrison was to be survivable on strategic warning; SICBM, on tactical warning. For reasons already discussed, US ICBMs will still be vulnerable to a preemptive strike and destabilizing to the extent that the president must still launch ICBMs upon attack warning or lose them on the ground should he decide to ride out the attack. The CIS will be able to hold US ICBMs at risk while the United States will not be able to target mobile CIS missiles. If a breakthrough in ASW technology were to occur, US ballistic missiles would be vulnerable to attack while the CIS could have as many as 1,100 survivable ICBM warheads.

Third, bombers are the most stable component of the nuclear system. A bomber may take several hours from the time it is launched until it reaches its assigned target. This time provides plenty of room for leadership to sort out a situation without committing to an nonreversible act. Unlike ICBMs, bombers can be launched on warning and yet recalled

if the warning proves to be false. Additionally, a nation can use bombers as a show of force and national resolve. A nation can use this capability to stabilize and defuse a growing crisis before it employs weapons of mass destruction. Bombers provide the most visible means of nuclear force generation—a tool that the NCA can use to send a powerful message.

To encourage the deployment of bombers, as opposed to ballistic missiles, the authors of START developed discounted rules for the way the United States and the CIS counted bomber weapons (see chapter 1). While many individuals criticized this approach as a sort of "authorized cheating," the START agreement sought to reduce the number of destabilizing ballistic missile warheads in the United States and Soviet arsenals to 4,900 while allowing for the retention of as many bombers as would fit under the 6,000 warhead and the 1,600 strategic nuclear delivery vehicle limits. The combination of START limits and bomber-counting rules puts a ceiling on the number of actual warheads that could be deployed. Based on planned force structure under the cold war, the United States actually would have deployed between 9,000 and 10,000 warheads and would still have been START compliant.

Under START II, this "cheating" was eliminated. The United States and the CIS count all bombers as-equipped, and thus all bomber weapons count toward the total warhead limit. Under this restriction, bombers are no longer an attractive delivery system. Currently, except for the ABM system around Moscow, there are no defensive systems against ICBMs; however, long-range bombers are susceptible to being downed by surface-to-air missiles (SAM). And the Soviets built and deployed a tremendous number of modern SAMs to defend against bomber attacks. Thus, the probability of a bomber weapon arriving at a target was less than that of a ballistic missile warhead—until the promise of stealth technology increased the chances of aircraft survivability. This probability was a major selling point for the B-2—it could penetrate Soviet air defenses undetected and deliver its weapons to the target. Unfortunately, the B-2's price tag made it hard to justify, particularly with the decreasing Soviet threat. And with the counting rules under START II, it is even less attractive as a nuclear delivery platform.

Under START, approximately one-half of the United States strategic arsenal would have been deployed on bombers. Under START II, only 25 to 35 percent will be deployed on bombers. Thus, START II has moved nuclear posture toward ballistic missile basing, which is much less stable than aircraft basing. By eliminating the discount rule for aircraft weapons, the framers of START II have undermined START's incentive to move toward a more stable aircraft-based posture.

Fourth, President Bush took the most stabilizing platforms off alert on 27 September 1991—the bombers. From this posture, few responses to a surprise attack remain. To prevent destruction of two legs (bombers and ICBMs) of the triad, the president would have to launch US ICBMs on warning—the very factor that has been criticized as the most destabilizing aspect of the triad. SSBNs at sea are survivable and could delay their response.

Under START II, ICBMs will carry only 14 to 17 percent of US strategic warheads. It would make more sense for the sake of both survivability and crisis stability to have bombers on alert and ICBMs not on alert. In this case, a nation could launch bombers upon receiving warning of a nuclear attack, thus providing guaranteed survivability to two legs of the triad, and not require the president to launch missiles on warning.

Fifth, the stabilizing nature of deMIRVing ICBMs under START II will be counterbalanced to some degree by the centralized storage of nuclear weapons. Although the probability of a CIS bolt-out-of-the-blue attack is extremely remote, the placing of tactical nuclear weapons and MIRVed RVs into storage has given the CIS an even bigger kill advantage in attacking nuclear weapons storage sites. In the current US posture, a surprise attack could eliminate US ICBMs and bombers, SSBNs in port, and stored tactical nuclear weapons with a relatively small number of warheads (assuming the president did not launch ICBMs on warning). Never before has the United States presented itself as such an attractive target for a bolt-out-of-the-blue attack.

Emphasis in the post–cold war era should move away from ballistic missile technology toward a safer and more stabilizing technology. This movement may mean banning ballistic missiles and allowing nuclear weapons delivery by aircraft only.

Decisive Firepower

While precision-guided munitions provided an extremely effective air campaign against Iraq, one must remember that the United States had complete air superiority throughout the war. In future wars, the United States may face a different set of circumstances. Countries learning a lesson from Desert Storm may acquire better air defense capabilities. Nuclear weapons provide a higher degree of confidence that a highly defended target can be destroyed. Aside from the ABM system around Moscow, no defense against an ICBM presently exists. The United States developed SRAM, ALCM, and ACM to give bombers a standoff capability against defended Soviet targets.

Leadership will face a dilemma with regard to employing precision-guided conventional weapons against weapons of mass destruction. On one hand, crossing the nuclear threshold will be something a leader will attempt to avoid at all costs. On the other hand, leaders must consider the ramifications of a near miss by conventional weapons. A near miss in attacking a nuclear ballistic missile site may mean a nuclear response against the United States or its allies. Even a near miss of a chemical or biological capability may be politically unacceptable if it results in retaliatory attacks on undefended population centers. Will US leadership chance such a risk?

Additionally, conventional precision-guided attacks on reinforced structures do not leave much visible external damage. A reconnaissance photograph may show merely a building with a hole in the top of it. Apart from human intelligence sources, it is impossible to ascertain the level of damage to the structure. Furthermore, if a capability is disabled, it is impossible to determine how long the capability will be down and how many additional strikes will be necessary to keep the facility out of commission for the duration of the conflict. Nuclear weapons provide a dual role in this situation, providing both visual confirmation of damage and confirmed downtime.

High Probability of Kill

As nuclear weapon delivery systems became increasingly more accurate during the cold war, the United States and the Soviet Union put a great amount of effort into hardening

critical facilities and weapon systems. In the aftermath of Desert Storm, nations will certainly be researching means to harden critical facilities against conventional precision attacks. In such cases, nuclear precision weapons may be necessary to hold these targets at risk.

As the United States and the CIS reduce the number of nuclear weapons over the next decade, nuclear weapons will become a scarcer resource. If leadership decides to strike a target with nuclear weapons, it cannot afford to use several nuclear weapons to ensure a single kill. Therefore, the United States must develop specialty warheads for certain cases and better delivery accuracy for others. For example, a deeply buried command and control bunker that has been hardened against nuclear blast may require an earth-penetrating mechanism coupled with a nuclear weapon to provide a high degree of confidence that it will be destroyed.

One of the most difficult issues to be tackled today is how to seek out and destroy mobile missiles. Desert Storm proved how difficult it is to find and destroy mobile systems. Even with complete air superiority, the United States found it difficult to locate and destroy large numbers of Scuds. In some cases, the United States was able to locate a Scud launcher only by the missile plume of a Scud being fired. This scenario certainly provides an unacceptable solution when it comes to weapons of mass destruction. While aircraft capability could be designed to perform effective wide-area search missions, the amount of loiter time necessary for such a mission would be prohibitive in a hostile air environment.

The deployment of Soviet SS-24 rail-mobile and SS-25 road-mobile missile systems provided an insurmountable problem for US targeteers. Even with an ICBM flight time of 30 minutes, these systems can move far enough from their original location during an ICBM time of flight to survive the ensuing nuclear blast. The ability to destroy such mobile missiles promptly requires one of two capabilities. Either the weapon system must receive external real-time reconnaissance to update its final aim point, or the system must have onboard sensors to detect the mobile target and alter its course to the target.

Minimizing Collateral Damage

The success of conventional precision-guided weapons in the Gulf War brought with it a high expectation for minimizing collateral damage to other structures and to civilians. Employment of nuclear weapons in the post–cold war era also must meet this requirement for any usage short of an outright nuclear exchange. Ways to minimize both fallout and radiation damage to nearby civilian populations and blast damage to adjacent structures must be considered. In many cases, collateral damage can be minimized through precision accuracy and selectable yields.

Precision Accuracy/Wide Variety of Yields

Planners designed the current strategic nuclear force structure to deter the Soviet Union and, should deterrence fail, to inflict maximum damage on the enemy. With few exceptions, planners designed the yields of strategic nuclear weapons to offset any delivery inaccuracy and ensure destruction of an intended target. They designed tactical nuclear weapons for a wide range of uses and for a wide range of yields. Some weapons have selectable yields. President Bush's decision to destroy ground-launched tactical nuclear weapons will significantly reduce the range of yields available for employment, especially those on the lower end of the spectrum.

Chapter 3 showed that the destruction of these lower yield tactical weapons may deter US leadership from using the remaining US stockpile. It is doubtful that many third world leaders believe the United States would actually launch a Minuteman III against them. The stockpile should provide a wide range of yields, giving US decision makers the option to employ nuclear weapons across the full spectrum of possible conflicts. In some cases, a small-yield warhead coupled to a precision system may be desired. In other cases, an area target or hardened structure may dictate a much larger yield. Selectable-yield warheads on a few ICBMs with rapid retargeting capability would provide a strong deterrent against third world weapons of mass destruction.

Selectable yields also provide another important ingredient—the ability to tailor a proportional US response. A US nuclear

response to an attack by weapons of mass destruction may be open to world criticism; however, an overly disproportionate nuclear attack may elicit much stronger disapproval from numerous countries.

Flexible Employment Options

While the US nuclear arsenal during the cold war contained a wide range of weapons, yields, and delivery options, unilateral initiatives and START II will not provide the same degree of flexibility. The much smaller force structure will lack the wide variety of yields and delivery systems that were present under the cold war, and the remaining systems will be fewer in number. Yet, the post–cold war force structure must perform an even broader mission than it did under the cold war. Not only must it deter attacks from the CIS, but it must deter the use of weapons of mass destruction by third world nations. Additionally, it must be employable in a manner conducive to a US victory (or at least to minimize damage to the United States), and it must retain a sufficient reserve to give the United States a position of strength from which to negotiate after a nuclear exchange (taking into account nuclear powers that were not involved in the exchange).

Thus, the United States needs to design maximum flexibility in its force structure. Selectable-yield weapons would provide the NCA with a wide range of responses from a set number of weapons. As discussed earlier, selectable-yield warheads coupled with rapid retargeting on a few ICBMs would prove a more believable deterrent for third world countries. Although most tactical nuclear weapons have been placed in storage, a number of ships and naval aircraft should maintain nuclear certification to provide the NCA a seaborne tactical response.

As the cold war was drawing to a close, the Air Force emphasized that long-range bombers perform twin missions—conventional and nuclear. General Butler, the last commander of SAC, coined the phrase "Twin Triad," in which bombers were the pivotal link between the nuclear triad and a conventional triad composed of bombers, tankers, and reconnaissance assets. Declaring B-1Bs as dedicated conventional platforms under START II will greatly reduce this touted flexibility. The remaining B-52s and newly acquired

B-2s will continue to provide the NCA with a long-range penetrating bomber and cruise missile capability.

Demonstration of Capability

Prior to the detonation of the atomic bomb on Hiroshima, national leaders discussed the merits of demonstrating the capability offshore as opposed to attacking a city. In the future, the NCA may want to demonstrate resolve without actually attacking a country—a "shot across the bow," if you will. Such action may be enough to get a potential adversary's attention and cause its leadership to terminate hostilities.

An electromagnetic pulse (EMP) attack may be useful against an industrialized opponent as an alternative to conducting direct air strikes. Drawbacks would include the inability to prevent electronic burnout in neighboring countries, as well as possible damage to satellites from a high-altitude burst.

Show of Force/Visible Generation

Show of force is an important part of US military doctrine, be it forward deployment, conducting exercises and war games, or deploying units from stateside. As discussed earlier, silo-based ICBMs do not offer a show of force or generation capability. Sending SSBNs to sea provides a visible generation but no show of force. Mobile ICBMs can provide a visible generation when they are dispersed from a centralized basing scheme, but they too provide no show of force. Of course, ICBM and SSBN generation is observable only to nations with space-monitoring assets.

Aircraft provide the most visible show of force and generation for the strategic triad. The recalling of crews and arming of aircraft is an observable generation. Placing aircraft on airborne alert is a visible show of force.

In many cases, the redeployment of tactical nuclear weapons on ships or to areas of forward deployment may be the best show of force and statement of US resolve in times of crisis. But since nuclear weapons are not visibly deployed, the show of force would actually be an official announcement by the president that nuclear weapons were being deployed.

Survivability

Generals Chain and Powell supported the START agreement during the cold war, contingent on continued strategic modernization. While some of those modernization programs provided for the replacement of aging systems and accuracy upgrades, many of the programs were designed to increase the survivability of strategic systems. With the tremendous decrease in numbers of nuclear weapons and delivery systems, survivability may be even more imperative during the post-cold war era. Stability is directly tied to survivability. Stability is a condition in which the enemy sees no advantage in attacking because he stands a high probability of losing more than he hopes to gain. Survivable systems ensure this high probability.

President Bush's cancellation of both the Rail Garrison and SICBM programs eliminated any hope the United States had to provide mobility for its ICBM force. As discussed previously, silo-based missiles are destabilizing, since they are in a use-or-lose condition when under an attack. A mobile system is inherently stable since it does not have to be launched on warning of an incoming attack. Mobile missiles can be dispersed around the countryside, allowing the leadership to sort out available information and avoid the dreaded problem of launching on false warning of attack.

As discussed previously, President Bush's decision to pull nuclear bombers off alert was destabilizing. Any surprise attack would have the capability to destroy the entire US bomber force on the ground. The storage of tactical nuclear weapons also invites surprise attack.

The net result is that the United States is in a rigid nuclear posture, poorly positioned for the bolt-out-of-the-blue scenario. Even with the small probability of such an attack, how much farther does the United States have to lower its guard before a surprise attack becomes tempting to an adversary?

Hedge against Uncertainty

The United States has sought to hedge against future uncertainty by maintaining a technological edge through extensive research and development and by deploying the most modernized forces in the world. Beyond technology, the

United States has sought to maintain redundancy in force structure to guard against unforeseen circumstances. This attempt was quite evident with the strategic triad. The ability of three different legs, each capable of performing overlapping missions, provided a hedge against catastrophic failure of one of the legs, whether it be due to component failure, communication failure, or enemy action. The triad can attack from multiple directions with complex timing, making it impossible for the enemy to defend against it.

The need for the triad was questioned continuously during the cold war by those seeking to reduce defense spending, and it will certainly continue to be attacked in the post-cold war era. With a significantly reduced force structure, the need for hedging against uncertainty, if anything, increases the need for the triad. Any technological breakthrough that can track submarines would put half of our START II strategic warheads at risk. The ability to detect stealth technology would put the B-2 and the ACM at risk. But the triad will continue to ensure that a single technological breakthrough will not render the entire strategic force incapable of performing its mission.

The United States and the CIS currently have an ABM treaty and have agreed to work on GPALS technology together. As the number of nuclear weapons decreases and ABM technology increases, the possibility of arms instability becomes greater. With superior numbers, it is possible eventually to overwhelm a defensive system. With limited numbers, this would not be possible. Should a "defense race" ensue, it is conceivable that one country could acquire an effective defense before another. This situation could be destabilizing in that the country with the defensive capability could launch a nuclear attack against another and shoot down any weapons that were launched in retaliation. The country with the defensive capability could even hold another country "hostage" without firing a single shot.

A serious concern during START negotiations was the ability of the Soviets to break out of the treaty. System modifications and on-site inspections were specifically intended to prevent any cheating under the treaty. START II overlooks the need for system modifications. Up to 100 noncruise-missile bombers can be reoriented to a purely conventional role without any physical modification. ICBMs can be deMIRVed without any

modification to prevent uploading. While this procedure provides both sides with the capability to hedge against cheating, the potential for breakout is greater than it would have been under START.

Bottom Line

Deterrence against weapons of mass destruction rests in the credibility and believability of US responsive action. This requires that US nuclear forces be capable of responding to any crisis at any level. It also requires that US leadership provide the world with a clear statement of US resolve to counter any weapons of mass destruction seen to be a threat to the United States or its allies. Above all, the United States cannot afford to allow nuclear weapons to lose their deterrent value by the lack of coherent guidance and policy.

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19. *National Military Strategy*, 13.

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22. 1991 *National Security Strategy*, 1–2.

23. Ibid., 6.

24. George Bush, "United States Defenses: Reshaping Our Forces," delivered to Aspen Institute, Aspen, Colo., 2 August 1990, in *Vital Speeches* 56, no. 22 (1 September 1990): 678.

25. *National Military Strategy*, 4.

26. START II does not limit bomber weapons in storage, but limits the number that can actually be loaded on an aircraft. Theoretically, a bomber could fly more than one mission by reloading.

Chapter 6

Conclusions and Recommendations

It is not apparent, either from the literature or from statements made by US leaders, that any attempt to date has been made to posture US nuclear forces for the post–cold war era. Rather, three major factors appear to have driven the unilateral initiatives and START II. First, the tremendous political changes within the Soviet Union resulted in a move toward democracy that provided an atmosphere conducive to cooperation with the United States. US leadership seized this unique opportunity with vigor and sought to accelerate the disarmament process as a hedge against any further political upheaval that would close this window of opportunity. Second, the United States and Soviet Union concluded that nuclear war would not be winnable and that moving from the hair-triggered posture of the cold war to a more stable and reduced nuclear posture provided advantage to all. The consensus was that the number of nuclear weapons allowed under START I could easily be cut in half. Third, the tremendous economic difficulty within the Soviet Union, brought about by years of mismanagement and large military expenditures and coupled with the desire within the United States to achieve a peace dividend from the termination of the cold war, produced a cooperative spirit on both sides to disarm in the most economic way possible. Thus, rules established under START were modified in a spirit of trust and economy.

START I took nine years to negotiate and 14 months to ratify. It allows for a seven-year draw-down period from its entry into force. However, the tremendous political changes within the Soviet Union put arms control on a fast track that resulted in two sets of unilateral initiatives and START II—within just 19 months of the START agreement. These actions affected not only the total number of nuclear weapons on both sides significantly, but also, nuclear posture, basing, modernization, research and development, and stability. These actions have been taken without any announced changes to

declaratory US nuclear policy. Additionally, in some instances the final force structure and posturing under these initiatives and START II run totally contrary to the clear line of stability logic established during 40 years of cold war and embedded in the START I counting rules. In particular, President Bush opted for a more destabilizing alert posture by leaving silo-based ICBMs on alert while taking bombers off alert, canceling two ICBM programs that would have provided survivability to the ICBM force, and signing START II, which offers no added incentives for either side to posture nuclear weapons on bombers that inherently have more stability than ballistic missiles. Additionally, President Bush's decision to destroy ground-launched tactical nuclear weapons and place the majority of remaining tactical nuclear weapons in US stateside storage might reduce the deterrent value of tactical nuclear weapons.

With regard to the fast-paced arms control initiatives, one could easily ask, Where's the fire? Obviously, potential instability within the Soviet Union raised US concerns over the safety and security of Soviet nuclear weapons. The coup attempt in 1991 certainly added to these concerns. Yet, even though START II is signed, it will take the Russians approximately a decade to dismantle the warheads that they indicated they will destroy.

Much could happen over the next 10 years. Further instability within the CIS could hinder compliance with START I and START II. The CIS republics of Kazakhstan, Belorussia, and Ukraine could refuse to surrender all nuclear weapons to Russia. Several third world countries could acquire weapons of mass destruction and ballistic missile delivery capability. The United States must rely on vigilance and careful planning to meet any threat that arises because of these uncertainties. Its challenge is how to anticipate and plan against a potential future threat.

Nuclear requirements under the cold war were threat-driven, based on the Soviets' target base. The NCA defined the role of nuclear weapons as deterrence based on the ability to inflict unacceptable damage on the Soviet Union should deterrence fail. Without a threat, the two nations no longer have the capability to determine future nuclear requirements. Nations

in a rush to disarm asked, How low can we go? This question provoked public discussion, but the answer lies within the response to a more fundamental question: What is the role of US nuclear weapons in the post–cold war era? Presently, Washington has offered no definitive response.

The role of nuclear weapons in the post–cold war era may increase in scope as the United States reduces both the size of its military and the number of forces forward-postured in overseas locations. No longer must nuclear weapons deter a single, well-understood opponent; now they must deter numerous countries either singularly or together in alliances within a complex, multipolar world. The concept of flexible response fits well within this environment to provide both credible deterrence and a wide spectrum of options to US leaders.

For the case of irrational, undeterrable third world leaders, the United States should consider adopting a war-winning strategy and possibly a declaratory second-use policy. Such a policy would state that the United States will not tolerate the use of weapons of mass destruction against it or its allies and that the United States would meet any such attack with nuclear retaliation.

Nuclear weapons may continue to play a vital role to hedge against conventional overrun of US contingency forces. As it draws down its defense forces, US capability to respond in times of crisis will be smaller. Desert Shield demonstrated the tremendous time required to mobilize US forces for a conflict. Desert Shield was unique in that the United States utilized troops and equipment from Europe that were being returned to the United States because of the CFE treaty. Additionally, the United States drew upon active duty personnel before military reductions had a big impact and upon basing and logistics support provided by Saudi Arabia's facilities. Future conflicts will not afford the United States such unique circumstances. Thus, the chances of US forces being overrun in regional contingency wars will increase in the post–cold war era. The ability of high-tech, conventional weapons to replace nuclear weapons in these scenarios remains to be seen.

The United States has destroyed its stockpile of biological weapons, and its signature on the Chemical Weapons Convention agreement ensures that it will not use chemical

weapons even to retaliate for chemical attacks. Thus, the United States has only two response options for chemical or biological attacks—conventional or nuclear weapons. While the United States is riding the "high moral ground" philosophy, confident of the newly proven abilities of precision-guided conventional munitions, no one has explored fully the ramifications of a US policy of using conventional weapons to deter chemical and biological weapons. In some instances, conventional weapons may not suffice to deter the use of chemical and biological weapons. Thus, nuclear weapons may continue as a requirement to deter chemical and biological weapons in the post–cold war era.

Since the Gulf War, the United States has focused its concern on a push for tighter nonproliferation efforts and the need for better defenses, namely global protection against limited strikes (GPALS). The 1993 *National Security Strategy* passively admits that these efforts will not suffice, in that it sets the United States' goal for limiting proliferation rather than preventing it. This current focus overlooks a US strategy when nonproliferation efforts fail. Such a strategy could range the spectrum, from passively accepting proliferation when it does occur to taking such active measures as surgical strikes to remove a threatening weapon system.

For the United States to continue to use nuclear weapons to provide a high level of deterrence in the post–cold war era, it must state a clear policy of their purpose and intended employment. Above all else, the United States should guard against the devaluation of nuclear weapons through any actual or perceived message that the United States would never actually use them in war. It can avoid devaluation by maintaining a nuclear stockpile that provides options for every possible scenario across the spectrum of conflict.

Although the United States can use bombers to deliver nuclear weapons against the third world, it should conduct studies to determine whether a higher delivery accuracy coupled with lower yields would provide a more usable system. Additionally, the United States should explore fast response capabilities. For the time being, SLBMs will remain MIRVed and will not present a usable option for third world conflicts. A few ICBMs with adjustable yields and fast retargeting

capability may provide a better deterrent, and certainly a more usable system, for third world scenarios. Additional capabilities may become necessary if countries place weapons or command and control facilities in nuclear-hardened underground shelters. Finally, the United States must ensure that, in destroying its arsenal of ground-launched tactical nuclear weapons, it retains capabilities for defending against conventional overrun.

In the area of future arms control, the United States and the CIS need to focus on the issue of stability. START II, while banning MIRVed ICBMs, still allows for MIRVed SLBMs. It also allows the CIS to continue to deploy mobile ICBMs, which the United States cannot hold at risk, while the United States continues to base ICBMs in targetable silos. In addition, START II does nothing to move away from ballistic missile basing and the ability of the United States and the CIS to obliterate each other within 30 minutes. If anything, START III should ban silo-based ICBMs, since they would not survive nuclear attack apart from an ABM system. Furthermore, it makes no sense to ban MIRVed ICBMs and allow MIRVed SLBMs. The total elimination of ballistic missile systems on alert would provide a much more stable nuclear environment than that under START II. Maintaining a few aircraft on alert would serve as a hedge against any nuclear attack.

Finally, any examination of a START III proposal must focus on the effects of other nuclear countries and defenses. Reducing the number of ballistic missiles could cause severe instability if significant ABM systems are deployed. For example, a country might acquire the capability to launch a nuclear attack and shoot down any missiles fired in retaliation. A focus on defensive systems could swing the United States from the arms race to a "defenses" race.

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