STRATEGY FOR THE LONG HAUL

CSBA

US Nuclear Forces

Meeting the Challenge of a Proliferated World

BY ANDREW F. KREPINEVICH

About the Center for Strategic and Budgetary Assessments

The Center for Strategic and Budgetary Assessments (CSBA) is an independent, nonpartisan policy research institute established to promote innovative thinking and debate about national security strategy and investment options. CSBA's goal is to enable policymakers to make informed decisions on matters of strategy, security policy and resource allocation.

CSBA provides timely, impartial and insightful analyses to senior decision makers in the executive and legislative branches, as well as to the media and the broader national security community. CSBA encourages thoughtful participation in the development of national security strategy and policy, and in the allocation of scarce human and capital resources. CSBA's analysis and outreach focus on key questions related to existing and emerging threats to US national security. Meeting these challenges will require transforming the national security establishment, and we are devoted to helping achieve this end.

About the Author

Andrew F. Krepinevich, Jr., President, is an expert on US military strategy, policy and operations, military revolutions, and counterinsurgency. He gained extensive strategic planning experience on the personal staff of three secretaries of defense, in the Department of Defense's Office of Net Assessment, and as a member of the National Defense Panel, the Defense Science Board Task Force on Joint Experimentation, and the Joint Forces Command's Transformation Advisory Board. He is the author of numerous CSBA reports on such topics as the Quadrennial Defense Review, alliances, the war in Iraq, and transformation of the US military. He has provided expert testimony before congressional committees, as well as academic and other professional groups. His work has been published in *The New York Times*, *The Wall Street Journal*, and *The Washington Post*, and professional and public policy journals, including *Foreign Affairs* and *Issues in Science and Technology*. He received the 1987 Furniss Award for his book, *The Army and Vietnam*. He is the author of the recent book, *7 Deadly Scenarios*. A graduate of West Point, he retired from the US Army in 1993. Dr. Krepinevich holds a Master of Public Affairs and Ph.D. from Harvard University.

US NUCLEAR FORCES: MEETING THE CHALLENGE OF A PROLIFERATED WORLD

STRATEGY FOR THE LONG HAUL

By Andrew F. Krepinevich

2009

ABOUT THE **STRATEGY FOR THE LONG HAUL** SERIES

This report is one in a series comprising CSBA's Strategy for the Long Haul intended to inform and shape the next administration's defense strategy review.

THE CHALLENGES TO US NATIONAL SECURITY. Translates the principal challenges to US security into a representative set of contingencies in order to determine what resources will be required, and how they should be apportioned among forces and capabilities.

US MILITARY POWER AND CONCEPTS OF OPERATION. Provides the connective tissue between the threats to US security and the capabilities and force elements needed to address the new challenges confronting the nation.

THE DEFENSE BUDGET. Overviews the budget environment and explores a range of options to make the Services' plans more affordable.

THE DEFENSE INDUSTRIAL BASE. Addresses the US defense industry's role as a strategic asset, and how it can best serve in that role.

MANPOWER. Examines recruitment and retention of quality people in sufficient numbers at an acceptable cost.

TRAINING, OPERATIONAL ART, AND STRATEGIC COMPETENCE. Assesses the need for an overhaul of training and education of America's service personnel and the importance of strategic thinking in senior leaders.

RESTRUCTURING THE US ALLIANCE PORTFOLIO. Considers the nature and type of alliances the United States needs in order to meet existing and emerging security challenges.

GROUND FORCES. Explores how the US Army and Marine Corps might best be organized, structured, modernized, and postured to meet existing and emerging challenges to US security.

SPECIAL OPERATIONS FORCES. Addresses the expansion and growing role of US Special Operations Forces.

MARITIME FORCES. Addresses how US maritime forces might best be organized, structured, modernized, and postured to meet existing and emerging challenges to US Security.

AIR AND SPACE FORCES. Explores how Air and Space Forces might best be organized, structured, modernized, and postured to meet existing and emerging challenges to US Security.

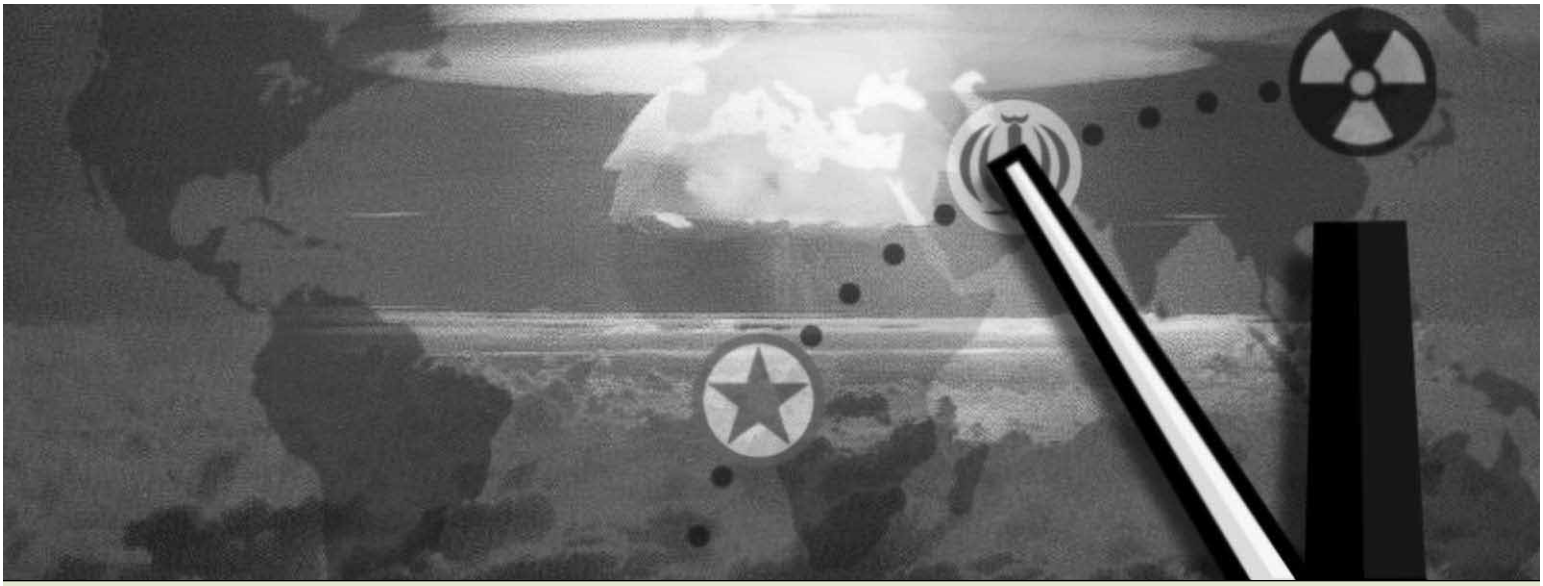
STRATEGIC FORCES. Examines the circumstances under which nuclear strategy and force posture decisions must be made today.

MODERNIZATION STRATEGIES. Explores potential modernization strategies that can best support the US defense posture in an era of great geopolitical uncertainty and rapid technological change.

ORGANIZING FOR NATIONAL SECURITY. Assesses how the United States Government can best organize itself to ensure effective strategic planning and execution of strategy.

A GRAND STRATEGY FOR THE UNITED STATES. Synthesizes the findings and insights of the study series.

CONTENTS



EXECUTIVE SUMMARY

This report seeks to provide the basis for an informed and constructive debate over the role of nuclear weapons in the overall US defense posture. To this end, the principal focus is on identifying the existing and emerging security environment as it pertains to nuclear weapons. The report also offers some recommendations on how the United States might best respond to the challenges posed by nuclear proliferation, and, hopefully, create a more secure global environment.

During the early days of the Cold War, an enormous amount of thought was given to the role of nuclear weapons in the overall US defense posture. The reason for this is simple: nuclear weapons were so destructive that they fundamentally altered the competitive environment. Indeed, for several decades substantial intellectual effort was devoted to understanding the US-Soviet nuclear competition, which was a defining feature of the Cold War security environment. With the Cold War's end, nuclear weapons proliferation has become an increasingly important issue; yet there has been comparatively little analysis of the kind that characterized the early Cold War period. Moreover, the main intellectual response to this growing danger to US security has been a renewed call for the eventual abolition of nuclear weapons. However, just as the nation's national security leaders at the dawn of the nuclear era had to contemplate a less-than-ideal outcome of their efforts (i.e., a Soviet Union armed with large numbers of nuclear weapons, including thermonuclear weapons), so too must current senior national security planners take into account a world in which they fail to achieve their policy objectives.

EFFORTS TO STEM PROLIFERATION

The United States tested its first thermonuclear weapon in 1952, and the Soviet Union followed suit in November 1955. Great Britain tested its first hydrogen bomb in 1958, while France tested its first atomic device in 1960, followed by China in 1964. Although the United States and the Soviet Union were bitter rivals, they did agree that the fur-

ther spread of nuclear weapons should be avoided. With that in mind, both supported the 1968 Treaty on the Non-Proliferation of Nuclear Weapons, often referred to as the Non-Proliferation Treaty, or NPT. Since the NPT entered into force, the rate of proliferation has slowed. Yet by the end of the Cold War, India had exploded a "peaceful" nuclear weapon. And although it had not tested a bomb, Israel was widely believed to have a substantial nuclear stockpile numbering one to two hundred weapons, including both fission and fusion bombs. Still, the more widely proliferated world that worried President Kennedy had not materialized. In short, the NPT had by all appearances proven to be remarkably effective in limiting nuclear proliferation during the Cold War. However, with the dramatic shift in the geopolitical environment following the Cold War, the nonproliferation regime began to show significant cracks, to the point where today some question its relevance.

According to some analysts, the end of the Cold War ushered in a "Second Nuclear Age" characterized by the further spread of nuclear weapons to nations in Asia and fears that non-state actors might acquire these weapons as well. A key US post-Cold War counter-proliferation objective centered on keeping North Korea from acquiring nuclear weapons. Talks failed to prevent Pyongyang from conducting an underground nuclear explosion in October 2006, making it the eighth confirmed nuclear-armed state. North Korea is now believed to have extracted and processed enough weapons-grade plutonium to build between six and eight nuclear fission bombs. Iran's efforts to develop a nuclear capability and perhaps nuclear weapons have also proceeded apace. Despite Tehran's repeated assurances that its nuclear program is entirely for peaceful purposes, the facts argue strongly that this may not be the case.

A SECOND NUCLEAR REGIME

To sum up, since 1998 the world has witnessed the progressive nuclearization of Asia as India, Pakistan and North Korea have joined China, Israel and Russia as members of the continent's nuclear-armed club, while Iran continues its worrisome nuclear activities. To make matters worse, several nuclear states — North Korea and Pakistan in particular — are relatively unstable. Adding to the complexity of the situation, both of these nuclear powers (as well as Iran and Syria) have links to terrorist groups that are well aware of the potentially devastating effects of nuclear weapons and other weapons of mass destruction, and are actively seeking to acquire them.

Four of the five declared nuclear powers during the First Nuclear Regime, which extended from 1945 to roughly the end of the Cold War, were part of the Western world. The Second Nuclear Regime, which succeeded it, finds proliferation moving from a world dominated by advanced industrial powers centered in Europe and America to Third World Asian states (i.e., India, Pakistan, North Korea), with more Asian states (i.e., Iran, Algeria, Egypt, Saudi Arabia and Syria) poised to follow. Thus in coming to grips with an n-player competition, it will be essential to develop an understanding of the way in which the leaders of very different cultures (e.g. Hindu, Muslim) view

nuclear weapons. To date the United States has not devoted anything approaching the level of intellectual effort to this matter that it did to understanding Soviet views on nuclear forces during the Cold War. Such an effort is necessary if US strategy with respect to nuclear forces is to shape the actions of other nuclear powers, to include deterring their use. Furthermore, in a multipolar nuclear world there is the prospect that defenses fielded to address the threat may affect the calculations of other rivals in undesirable ways. These second-order effects are likely to be far more pervasive, and more significant, than was the case during the First Nuclear Regime

The US military's fielding of what is viewed by some expert observers as a non-nuclear strategic strike capability has blurred the distinction between nuclear and non-nuclear weapons. The special status that nuclear weapons have traditionally held may be further compromised with the development of cyber weapons, which are capable of disabling, quickly and (arguably) reliably, certain kinds of strategic targets. Yet while these weapons complicate thinking about strategic strike operations and the role of nuclear weapons, neither of them can, individually or in combination, displace nuclear weapons' capacity to create destruction and loss of life on a massive scale with a single, highly deliverable package. In a world where technology is displacing so much of what came before, including weapons of war, nuclear weapons will continue to cast a long shadow over humankind for the indefinite future.

It may be that deterrence, the cornerstone of US nuclear strategy during the First Nuclear Regime, will retain its importance in a more proliferated world. On the other hand, deterrence is based, to a significant extent, on the premise that it is possible to identify the source of an attack, a condition that may be increasingly difficult to meet. Deterrence also assumes an understanding of a rival's sense of costs and benefits, and what he fears. This assumption may not prove out in the case of newly armed nuclear powers. It may be that some of the new nuclear-armed states do not calculate costs and benefits in a manner similar to that of the United States. They may be driven by other factors as well—domestic instability, historical rivalries, poverty, etc.—any of which could make their views on the utility of nuclear weapons significantly, and perhaps markedly, different from those of US policy makers. In short, deterrence could play a much reduced role in a proliferated world, while the prospect of nuclear use, defenses against nuclear attack, war termination strategies, and post-war considerations assume greater importance in defense strategy and planning.

The Second Nuclear Regime emerged thanks in no small measure to the existence of a market for nuclear weapons technology. Early in the First Nuclear Regime, technology was acquired, to a great extent, by theft, typically through the efforts of spies, or by willing transfer. While it appears that neither weapons-grade fissile material nor nuclear weapons themselves have been transferred from one country to another, there are concerns that such a direct market for nuclear weapons could be established, especially given the character of the North Korean regime and Iran's apparent drive to become a nuclear-capable (if not nuclear-armed) state. Potentially of even greater concern is the prospect that Saudi Arabia may seek nuclear weapons should

Iran become a nuclear power. Given their country's central role as an exporter of oil to the global economy, should the Saudis choose to purchase a nuclear arsenal it may be difficult for the United States, or other countries, to impose economic sanctions against it, let alone attempt to reverse the act through the use of force. Should such a situation obtain, it could pave the way for an open, and greatly expanded, nuclear arms market, to include the transfer of nuclear weapons themselves.

THE LOGIC OF ZERO?

While "ban the bomb" movements are almost as old as nuclear weapons themselves, the current movement toward eliminating all nuclear weapons has attracted support across the political spectrum. By far the most influential presentation of this view has been advanced by Henry Kissinger, Sam Nunn, William Perry and George Shultz, highly regarded senior statesmen from both political parties. The "Four Horsemen of the Apocalypse," as they have been called, argue that the world is at a "nuclear tipping point" in which "nuclear weapons [are] more widely available, [and] deterrence decreasingly effective and increasingly hazardous." It is easy to understand why the "logic of zero" nuclear weapons, as some refer to it, is so compelling. But is it possible to fashion a world without nuclear weapons? Simply stated, nuclear weapons confer a strong security guarantee. Inducing states either to forego their acquisition or to give them up requires providing states with an alternative guarantee of equal or greater value than the guarantee provided by a nuclear arsenal. This is especially true in the case of states with inferior conventional militaries. Those advocating a shift to a world without nuclear weapons would have to address two key questions: where would such a guarantee come from, and why would it be credible?

It may be that the only practical way to bring about global nuclear disarmament and realize the benefits in terms of reduced military expenditures and enhanced prospects for world peace is to establish some form of global government or global hegemonic power. However, establishing a global government seems unlikely, especially under the current circumstances. Further, it is not clear that, assuming one could be created, such a global government would reflect the liberal, democratic values that many nuclear abolitionists hold dear.

Some nuclear abolitionists argue that the United States can safely reduce its deployed nuclear warhead levels—currently projected at between 1,700 and 2,200—to 1,000 or fewer, especially if the Russians were to do the same. Regarding overall numbers, however, there is at least one important asymmetry that must be addressed. It involves the substantial number of states that are sheltered under the US nuclear umbrella—the states to which Washington has given a guarantee that the United States will respond decisively against any enemy state that employs nuclear weapons against them; the United States must be prepared to defend both itself and over a dozen other countries from nuclear attack.

Many advocates of a nuclear-free world argue that in order to strengthen the NPT, the United States should forego developing any new nuclear weapons. At first blush, this seems to make eminent sense. But opponents of foreswearing the development of new nuclear weapons offer three reasons: first, weapons design teams have very specialized skills that risk being lost if they are not put to use; second, the United States may, at some point, need to develop a new generation of nuclear weapons to address security challenges for which there may be no other alternative; and third, the existing stockpile of nuclear weapons is becoming less reliable as it ages, necessitating a replacement of old weapons with newer, reliable ones known as reliable replacement warheads, or RRWs. The reliability of these aging weapons could be confirmed with testing. However, the United States has observed a test moratorium since 1992, and opponents of the RRW (as well as the Four Horsemen) are calling for the United States to ratify the Comprehensive Test Ban Treaty (CTBT), which would permanently ban all nuclear weapons testing.

What are we to make of all this? It appears the United States has two overriding objectives when it comes to the issue of nuclear weapons: maintaining an effective nuclear arsenal, and limiting (and ultimately reducing) the number of nuclear weapons to the point of elimination. These objectives may be incompatible. Simply put, the United States must either accept long-term risk in its ability to "maintain a safe, secure and effective [nuclear] arsenal" or the risk associated with testing that might obviate the need for further nuclear weapons production, but also enable substantial reductions in the US nuclear stockpile.

Given these formidable barriers, even those who continue to advocate for a nuclear-free world might see the virtue in developing a "Plan B" policy should their ambitious objectives fail to materialize. Indeed, based on the analysis to this point, it seems the future we will inhabit will be a significantly more proliferated world than that which exists today. Prudent planning requires that this future—unpleasant to contemplate though it may be—and its implications for US nuclear forces be examined as well, rather than be shunted aside through willful ignorance on our part.

A PROLIFERATED MIDDLE EAST?

While there is continued debate over Iran's *intentions*, Tehran is, at a minimum, almost certainly engaged in a large-scale effort to acquire the *capability* to build nuclear weapons. Persistent (albeit fitful) efforts by the international community to dissuade Iran from its apparent objective have yet to succeed. Tehran has successfully moved a considerable way along the path toward acquiring nuclear weapons. Given the potential cascade of nuclear proliferation that may follow any overt declaration of a nuclear capability, Iran may judge that its interests are best served by establishing a "latent" or "virtual" nuclear capability along the lines of what Israel has done. Should this come to pass, or if Iran overtly develops a nuclear arsenal, it might encourage Tehran to pursue more aggressively its various forms of ambiguous ag-

gression throughout the Middle East and beyond. If Iran tests a nuclear weapon, the situation for Israel could change dramatically in a manner somewhat similar to that of the United States when the Soviet Union tested its first atomic weapon in August 1949. In a strictly military sense Israel would likely be better positioned to derail the Iranian nuclear program before it reached the weaponization phase. Yet an argument can also be made that the political case for preventive action may be stronger once Iran had openly demonstrated its duplicity in the face of genuine efforts by the international community to assist Tehran in its "peaceful" development of nuclear energy. Should Israel forego military action against Iran, a bipolar regional nuclear competition could ensue, at least in the near term while other regional powers decide whether or not to enter the nuclear arena.

How might crisis stability be preserved under these conditions? Let us assume that crisis stability means preserving a secure second-strike capability so as to reduce the incentive of any state to initiate nuclear weapons use. Given this assumption, a Middle East characterized by a multipolar nuclear competition comprising asymmetric and immature capabilities may be a place of great crisis instability. Given relatively limited resources, the newly minted nuclear powers will have some tough choices to make about how they size and shape their forces, and how they control and protect them. It may be simpler for a newly armed nuclear power to build more nuclear weapons and delivery systems, and to hide a portion of them in locations that would be difficult to detect, in the hope that this would ensure the survival of a sufficient number of weapons to retaliate in the event of an attack. Should this condition obtain, a single compromise of positional data could produce a major shift in the nuclear balance and perhaps even invite an attack.

Unlike during the Cold War era, when the United States and Soviet Union dominated the nuclear competition, might external powers be able to exert a significant influence on a regional nuclear competition? Generally discarded halfway through the Cold War—especially by the United States—defenses may play an important role in preserving deterrence and terminating a conflict. In a crisis, the United States could, in theory, threaten to intercept the ballistic missiles of any state attempting a first strike. It may also be possible to intercept nuclear-capable aircraft and cruise missiles. In attempting to terminate a conflict, the United States could declare that its forces will intercept any ballistic missiles or nuclear-capable aircraft or cruise missiles launched by any power after a declared cease-fire goes into effect.

NEW THINKING NEEDED

If nothing else, this report seeks to raise awareness of the need for a fundamental rethinking of the underlying strategic logic developed during the Cold War with regard to nuclear weapons. The conditions that informed that logic have, in many respects, passed into history along with the Cold War itself. The number of nuclear-armed

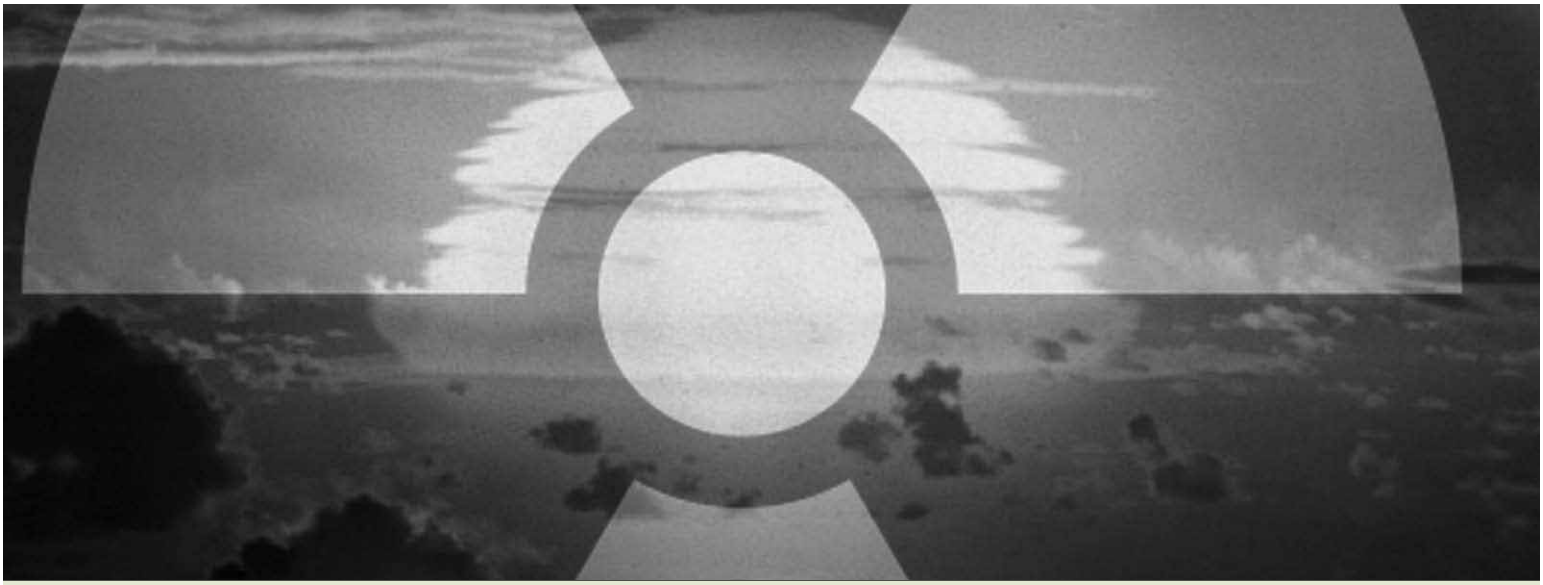
states has grown significantly, and more may be on the way. With US and Russian nuclear force reductions, the world may well be shifting from a bipolar nuclear world to a multipolar nuclear world, complete with regional arms races. With the fielding of long-range guided weapons in large numbers and the creation of cyber weapons following the rise of information-based economies, nuclear weapons are not the only means for inflicting prompt and devastating destruction on a broad scale. An increase in the number of nuclear-armed states, some of them unstable, raises the prospect that nuclear weapons may fall into the hands of nonstate entities bent on causing catastrophic destruction. New forms of deterrence may be needed to prevent such attacks, if deterrence is possible at all. Finally, more nuclear powers means an increased risk of ambiguous nuclear aggression, presenting yet another problem that received little attention during the Cold War.

Where does that leave us? We would do well to take a lesson from our Cold War-era predecessors, a succession of administrations who took a realistic view of what arms control might accomplish, while at the same time devoting great intellectual effort—especially in the early years of the nuclear age—to developing strategies for addressing the challenges of the world they lived in. The recommendations that follow are modest. Their purpose is to keep the United States' nuclear options open until such a review is completed and a well-crafted strategy is in place.

- Building and expanding global counterproliferation partnerships, strengthening NPT compliance and enforcement regimes, and improving human intelligence dedicated to counter-proliferation should be accorded high priority.
- The United States can also assist friendly governments of new nuclear-armed states in improving their controls over their nuclear weapons, fissionable materials, and weapons production infrastructure.
- Capabilities that enhance the United States' ability to detect, intercept and secure both weapons-grade fissile material (and even nuclear weapons themselves) could prove invaluable in enforcing existing control agreements; intercepting nonstate entities armed with so-called dirty bombs or nuclear weapons, and recovering "loose nukes" that arise in the event a nuclear-armed state descends into chaos.
- The United States must explore the full range of defenses against nuclear attack, to include attacks by traditional means (e.g., ballistic missiles, aircraft, and cruise missiles) and nontraditional means (e.g., covert insertion).
- Should deterrence fail and a limited attack occur, the United States must be able to mitigate the consequences of a limited nuclear attack on itself or its allies in such a manner as to maintain freedom of action to preserve collective interests at home and abroad.

- Some modest reductions in nuclear force levels below the 1,700 minimum called for in the Strategic Offensive Reductions Treaty may be warranted. However, the greater the reductions, the lower the barrier becomes for other prospective rivals to join the United States and Russia as major nuclear powers. Given these considerations, 1,500 warheads seems an absolute floor for the time being.
- The United States must have the capability to respond promptly and devastatingly to aggression through both nuclear and nonnuclear means (e.g., guided weapons and cyber strikes), to include the ability to effect regime change in minor nuclear powers. To this end, the United States should enhance its capabilities for conducting highly distributed, highly integrated power-projection operations from standoff ranges (i.e., absent the use of fixed forward bases) under conditions of radioactive contamination, or against an enemy who retains the ability to threaten nuclear attack.

This report concludes that while the United States should continue to accord high priority to arresting nuclear proliferation and reversing it where possible, it must craft strategies for the world it will likely inhabit for the indefinite future: a world of eight or more nuclear-armed states—some of which are unstable, have ties to radical nonstate groups, or both—with the prospect of more to follow.



INTRODUCTION

This report seeks to provide the basis for an informed and constructive debate over the role of nuclear weapons in the overall US defense posture. To this end, the principal focus is on identifying the existing and emerging security environment as it pertains to nuclear weapons. The report also offers some recommendations on how the United States might best respond to the challenges posed by nuclear proliferation, and, hopefully, create a more secure global environment.

During the early days of the Cold War, an enormous amount of thought was given to the role of nuclear weapons in the overall US defense posture. The reason for this is simple: nuclear weapons (and especially thermonuclear weapons) were so destructive that they fundamentally altered the competitive environment. As one eminent strategist noted at the dawn of the nuclear age, from that point forward the only rational purpose for the US military would be to deter wars, rather than fight them.[1]

While efforts to understand the implications of nuclear weapons began even before the first atomic bomb test in July 1945,[2] it was the Soviet Union's detonation of an atomic bomb in August 1949 that led to a major review of America's national security strategy by many of the country's leading strategic thinkers, including George Kennan, Paul Nitze and eventually President Dwight Eisenhower himself.[3] They

---

1 In 1946, six years before the development of thermonuclear weapons, Bernard Brodie asserted that "Thus far the chief purpose of our military establishment has been to win wars. From now on its chief purpose must be to avert them." Accessed at http://www.nuclearfiles.org/menu/key-issues/nuclear-weapons/history/cold-war/strategy/strategy-deterrence.htm, on January 3, 2009.

2 For a general overview on early discussions of how atomic weapons might be employed, see Richard Rhodes, *The Making of the Atomic Bomb* (New York: Simon & Schuster, 1986), pp. 620-650, and 750-766. Prior to the bomb's use against Japan, an Interim Committee was established in May 1945 "to develop policy for the atomic era until Congress could create a postwar agency for that purpose." John Newhouse, *War and Peace in the Nuclear Age* (New York: Vintage Books, 1988), p. 43.

3 See Dean Acheson, *Present at the Creation* (New York: W.W. Norton, 1969), pp. 373-81; McGeorge Bundy, *Danger and Survival* (New York: Random House, 1988), pp. 199-231, 246-60; and Robert R. Bowie and Richard H. Immerman, *Waging Peace* (Oxford, UK: Oxford University Press, 1998), pp. 17-40, 123-46.

clearly understood that the strategic advantage the United States enjoyed by virtue of its status as the world's only nuclear power was almost certain to be lost as Moscow undertook to build its own nuclear arsenal. Put another way, if strategy is about identifying, creating and exploiting areas of advantage to achieve core security objectives, then the United States needed to address the consequences of this "wasting asset" for its overall strategy to meet the Soviet threat. These efforts produced several seminal strategy documents, including NSC-68 and NSC 162/2. These documents, and the intellectual foundation that supported them, provided the basis for the United States' successful strategy in the Cold War.

Indeed, for several decades substantial intellectual effort was devoted to understanding the US-Soviet nuclear competition, which was a defining feature of the Cold War security environment. The demise of the Soviet Union in the early 1990s signaled a new era in US national security, as the nuclear competition between the United States and Russia declined dramatically. With the Cold War's end, however, nuclear weapons proliferation has become an increasingly important issue. Yet there has been comparatively little analysis of the kind that characterized the early Cold War period. Moreover, the main intellectual response to this growing danger to US security has been a renewed call for the eventual abolition of nuclear weapons. While similar arguments were advanced in the early days of the US-Soviet nuclear rivalry, they were not the only focus of US national security strategy.

In brief, the principal focus of current thinking regarding nuclear weapons appears to be centered on strengthening efforts to stem their proliferation, and to advance their abolition. In addition, efforts to deny nonstate radical elements access to nuclear weapons and defending against their use also are accorded prominent treatment. These are worthy goals. However, just as the nation's national security leaders at the dawn of the nuclear era had to contemplate a less-than-ideal outcome of their efforts (i.e., a Soviet Union armed with large numbers of nuclear weapons, including thermonuclear weapons), so too must current senior national security planners take into account a world in which they fail to achieve their policy objectives. Indeed, if history is any guide, we are far more likely to witness the continued proliferation of nuclear weapons than a world with fewer nuclear-armed states, let alone a world without such weapons. The odds of sustaining the norm against using these weapons, which has been in effect since 1945, also seem to be growing longer. Prudent defense planners must prepare for disagreeable outcomes, lest their efforts to pursue more desirable results jeopardize the nation's security in the (likely) event these fail to materialize.

This report is organized in the following manner: Chapter 1 describes the events leading up to the current situation; Chapter 2 identifies the principal changes in the competitive environment since the Cold War, as it pertains to the role of nuclear weapons; Chapter 3 assesses the prospects for responding to these changes by placing

efforts to achieve nuclear disarmament at the center of US national security strategy; Chapter 4 examines the policy and strategy implications for the United States in a more proliferated world, with Iran as the focal point of a case study approach to the issue. Finally, in the Conclusion, specific recommendations are offered regarding the United States' nuclear force posture, along with a summary of findings.

PROJECT RAND

CHAPTER 1 > **BACKGROUND**

The United States tested its first thermonuclear weapon in 1952, and the Soviet Union followed suit in November 1955. Great Britain tested its first hydrogen bomb in 1958, while France tested its first atomic device in 1960, followed by China in 1964. During this period and into the 1960s, many of the United States' leading strategic thinkers — including Bernard Brodie, Herman Kahn, Henry Kissinger, Andrew Marshall, and Albert Wohlstetter, to name but a few — devoted most of their professional energies to refining our understanding of the radically altered threat environment that nuclear weapons had wrought and to exploring how the country might best craft a strategy to address it. Their efforts added a cluster of new terms (extended deterrence, nuclear umbrella, countervalue, counterforce, launch-on-warning, launch-under-attack, damage limitation, throw-weight, and equivalent megatonnage) to the strategist's lexicon. New measures of effectiveness were also needed to enable strategic planners to assess this different kind of competition.

As nuclear weapons spread to each of the great powers, concerns grew over the prospect that they would proliferate even further. President John Kennedy publicly admitted at a March 21, 1963, press conference that

> I am haunted by the feeling that by 1970…there may be 10 nuclear powers instead of four, and by 1975, 15 or 20.…I see the possibility in the 1970's of the President of the United States having to face a world in which 15 or 20 or 25 nations may…[have] these weapons. I regard that as the greatest possible danger and hazard.[4]

Fortunately, the president's fears proved unfounded. Although the United States and the Soviet Union were bitter rivals, they did agree that the further spread of nuclear weapons should be avoided. With that in mind, both supported the 1968

---

[4] President John F. Kennedy, Press Conference, State Department Auditorium, Washington, D.C. March 21, 1963, Cited at: http://www.jfklibrary.org/Historical+Resources/Archives/Reference+Desk/Press+Conferences/003POFO5Pressconference52_03211963.htm, accessed on January 3, 2009.

Treaty on the Non-Proliferation of Nuclear Weapons, often referred to as the Non-Proliferation Treaty, or NPT. The NPT was, in essence, a "grand bargain" between the nuclear-weapon states and non-nuclear powers involved. The former agreed not to transfer nuclear weapons technology to other states, while the latter agreed not to pursue nuclear weapons of any type.[5] Importantly, there was a provision for the transfer of nuclear technology for the purposes of developing civilian nuclear energy. This provision has been used by several signatories as a means of pursuing a nuclear weapons program.[6] Among the world's recognized sovereign states, only four (India, Israel, North Korea, and Pakistan) are not signatories to the treaty; all four have developed nuclear weapons.[7] Finally, the nuclear state signatories pledged to reduce their arsenals, with an ultimate goal of complete nuclear disarmament.

Since the NPT entered into force, the rate of proliferation has slowed. Yet by the end of the Cold War, India had exploded a "peaceful" nuclear weapon. And although it had not tested a bomb, Israel was widely believed to have a substantial nuclear stockpile numbering one to two hundred weapons, including both fission and fusion bombs.

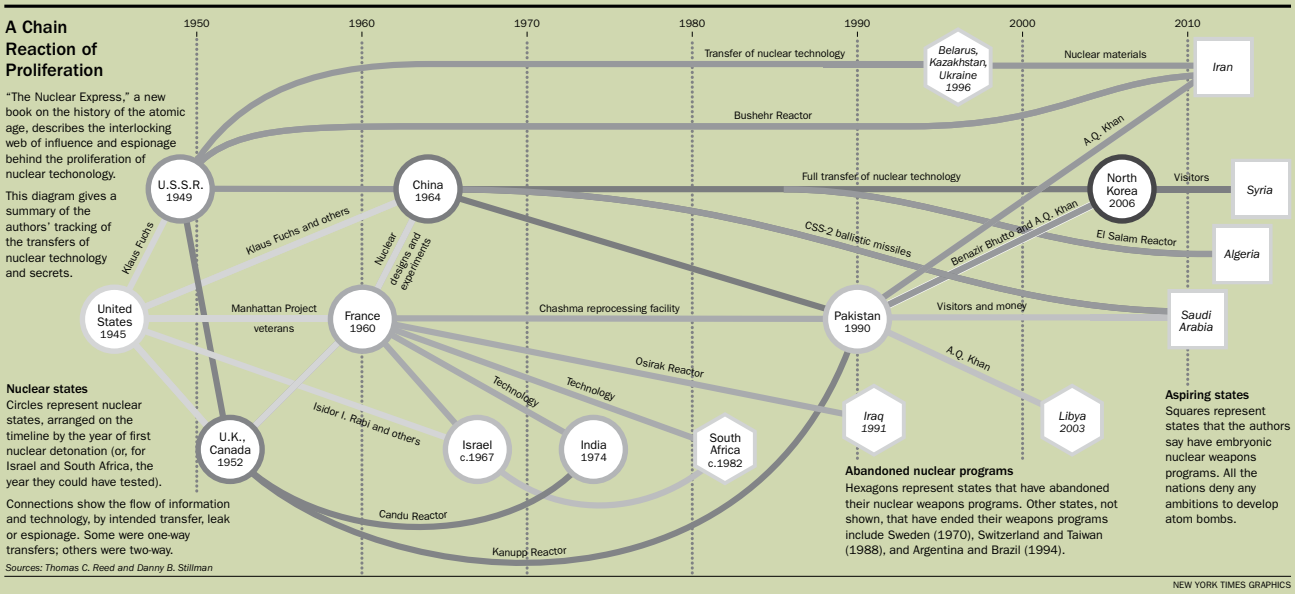
---

5 China and France were not original signatories to the Treaty, and over two decades elapsed before they eventually signed it.

6 Among those NPT members in this category are Iran and Syria. Libya and South Africa also pursued covert nuclear weapons programs, but abandoned them. South Africa created a small nuclear capability, which it later dismantled.

7 North Korea was a signatory to the NPT, but withdrew from the treaty in 2003.

FIGURE 1. **THE ROAD TO A PROLIFERATED WORLD**



However, the more widely proliferated world that worried President Kennedy had not materialized. The United States successfully dissuaded both the Taiwanese and South Korean governments from continuing their weapons programs, threatening to limit or withdraw military support for both nations.[8] In the early 1990s, South Africa voluntarily dismantled its nuclear program, destroyed its few operational weapons, and signed the NPT. In 1991 Iraq's defeat in the First Gulf War effectively short-circuited that state's covert nuclear arms program. Later that year, following the Soviet Union's dissolution, Belarus, Kazakhstan and Ukraine agreed to transfer their nuclear weapons to Russia. The United States also began efforts to help secure the enormous stockpile of Soviet nuclear weapons and materials under the Cooperative Threat Reduction Program (popularly known as the Nunn-Lugar program).

China and France, the two declared nuclear powers that had not signed the NPT, acceded to the Treaty in 1992. In short, the NPT had by all appearances proven to be remarkably effective in limiting nuclear proliferation during the Cold War. However, with the dramatic shift in the geopolitical environment following the Cold War, the nonproliferation regime began to show significant cracks, to the point where today some question its relevance.

With the dramatic shift in the geopolitical environment following the Cold War, the nonproliferation regime began to show significant cracks, to the point where today some question its relevance.

Indeed, the danger that haunted President Kennedy had not gone away, as the Defense Department's 1993 Bottom-Up Review confirmed:

> Dangers posed by nuclear weapons and other weapons of mass destruction (WMD)—that is, biological and chemical weapons—are growing. Beyond the five declared nuclear-weapon states (the United States, Russia, France, Great Britain, and China), at least 20 other nations either have acquired or are attempting to acquire weapons of mass destruction.
>
> In most areas where US forces could potentially be engaged on a large scale, such as Korea or the Persian Gulf, our likely adversaries already possess chemical and biological weapons. Moreover, many of these same states (e.g., North Korea, Iraq, and Iran) appear to be embarked upon determined efforts to acquire nuclear weapons.[9]

According to some analysts, the end of the Cold War ushered in a "Second Nuclear Age" characterized by the further spread of nuclear weapons to nations in Asia and fears that non-state actors might acquire these weapons as well.[10]

A key US post-Cold War counter-proliferation objective centered on keeping North Korea from acquiring nuclear weapons. On March 12, 1993, citing US and South

---

[8] Rebecca K.C. Hersman and Robert Peters, "Nuclear U-Turns: Learning from South Korean and Taiwanese Rollback," *Nonproliferation Review*, November 2006.

[9] Les Aspin, Secretary of Defense, *Report on the Bottom-Up Review* (Washington, D.C.: Office of the Secretary of Defense, October 1993), available online at http://www.fas.org/man/docs/bur/index.html, accessed on June 20, 2008.

[10] See, for example, Paul Bracken, "The Second Nuclear Age," *Foreign Affairs*, January/February 2000; and Fred Charles Iklé, "The Second Coming of the Nuclear Age," *Foreign Affairs*, January/February 1996.

Korean "threats," North Korea announced its intention to withdraw from the NPT. After hurried negotiations between the three states, North Korea appeared to back down, entering into an "agreed framework" understanding that called for Pyongyang to freeze its nuclear weapons research in return for concessions from both South Korea and the United States. However, in 1997 the Defense Department revealed that when the framework was signed, North Korea had already extracted enough fissile material to build at least one nuclear warhead, and perhaps more. In other words, North Korea had joined Israel as an undeclared but assumed nuclear power.[11]

Efforts to stem nuclear proliferation in Asia incurred another setback when, in May 1998, India conducted a series of five underground nuclear explosions as part of Operation Shakti, the first such test since its "peaceful nuclear explosion" in 1974. On May 14 Indian Prime Minister Atal Behari Vajpayee declared "India is now a nuclear weapons state." Within two weeks of India's tests, Pakistan tested five nuclear devices of its own, becoming the seventh confirmed (and ninth suspected) member of the nuclear club.[12]

Two years later, the US Commission on National Security/21st Century, also known as the Hart-Rudman Commission, concluded that preventing the proliferation of weapons of mass destruction would be one of the highest priorities for the United States over the next quarter century.[13] Despite such warnings, the trend toward nuclear proliferation continued. In 2002, North Korea openly acknowledged it had continued clandestine nuclear weapons development after signing the 1994 agreed framework. The following year it claimed to have several nuclear weapons, and made good on its earlier threat to withdraw from the NPT. Shortly thereafter, five other states (the United States, China, Japan, Russia and South Korea) engaged with North Korea in discussions known as the Six-Party Talks with the goal of achieving a peaceful resolution to its nuclear weapons program. These talks failed to prevent North Korea from conducting an underground nuclear explosion in October 2006, making it the eighth confirmed nuclear-armed state. North Korea is now believed to

---

[11] Siegfried S. Hecker, "Report on North Korean Nuclear Weapon Program," Stanford University, Center for International Security and Cooperation, November 15, 2006, accessed at http://www.fas.org/nuke/guide/dprk/nuke/hecker1106.pdf; and "North Korean Nuclear Weapons Program," accessed at http://www.fas.org/nuke/guide/dprk/nuke/index.html. Both sites were accessed on January 4, 2009.

[12] Howard Diamond, "India Conducts Nuclear Tests; Pakistan Follows Suit," *Arms Control Today*, May 1998, accessed at http://www.armscontrol.org/act/1998_05/hd1my98.asp on January 4, 2009.

[13] The United States Commission on National Security/21st Century, *Seeking a National Security Strategy: A Concert for Preserving Security and Promoting Freedom,* April 15, 2000, p. 8, accessed at http://www.fas.org/man/docs/nwc/PhaseII.pdf on January 4, 2009. The Commission concluded that "Non-proliferation of weapons of mass destruction is of the highest priority in U.S. national security policy in the next quarter century."

have extracted and processed enough weapons-grade plutonium to build between six and eight nuclear fission bombs.[14]

While North Korea has frustrated efforts to halt its march toward becoming a nuclear weapons state, Iran's efforts to develop a nuclear capability and perhaps nuclear weapons have proceeded apace. Despite Tehran's repeated assurances that its nuclear program is entirely for peaceful purposes, the facts argue strongly that this may not be the case. In February 2003, the UN nuclear weapons watchdog agency, the International Atomic Energy Agency (IAEA), upon inspecting Iran's uranium enrichment facility near Natanz, announced that Iran had committed a serious violation of its obligations under the NPT. The plant was equipped with hundreds of gas centrifuges capable of producing the highly enriched uranium necessary to construct atomic weapons.[15] Several months later an IAEA inspection revealed traces of highly enriched uranium. Under pressure from the international community, in December 2003 Iran signed the Additional Protocol to the Non-Proliferation Treaty, which allowed the UN to conduct more intrusive inspections of Iranian nuclear facilities. In November 2004, after revelations that Iran had covertly received nuclear assistance from Pakistan, the IAEA demanded that Iran suspend its nuclear-related activities until an investigation could take place. Although Iran agreed to temporarily abide by the IAEA's resolution, in August 2005 it announced the resumption of its uranium conversion efforts.

Despite Tehran's repeated assurances that its nuclear program is entirely for peaceful purposes, the facts argue strongly that this may not be the case.

Two years later, in December 2007, the United States intelligence community published a controversial *National Intelligence Estimate* that declared, with a "high level of confidence," that Iran had halted its nuclear weapons program in 2003 and that the program remained frozen. The estimate nevertheless conceded that Iran's enrichment program could still provide it with enough raw material to produce a nuclear weapon sometime by the middle of next decade.[16] This conclusion corresponds with that of Mohamed ElBaradei, head of the IAEA, who in October 2007 declared "I cannot judge their intentions, but supposing that Iran does intend to acquire a nuclear bomb, it would need between another three and eight years to succeed."[17]

---

[14] Hecker, "Report on North Korean Nuclear Weapon Program" and "North Korean Nuclear Weapons Program." In June 2008, the United States agreed to remove North Korea from the State Department's list of state sponsors of terrorism in exchange for a declaration of its nuclear activities. That declaration, however, only addressed Pyongyang's production of plutonium and omitted any information about its assembled nuclear weapons, its alleged uranium enrichment program, or any efforts on its part to share nuclear technology with other nations. Helene Cooper, "Bush Rebuffs Hard-Liners to Ease North Korean Curbs," *New York Times*, June 27, 2008; and Peter Speigel and Barbara Demick, "North Korea Wins U.S. Concessions," *Los Angeles Times*, June 27, 2008.

[15] Massimo Calabresi, "Iran's Nuclear Threat," *Time*, March 8, 2003, accessed at http://www.time.com/time/world/article/0,8599,430649,00.html, on January 4, 2009.

[16] National Intelligence Council, "Iran: Nuclear Intentions and Capabilities" November 2007, accessed at http://www.dni.gov/press_releases/20071203_release.pdf, on January 4, 2009.

[17] "Iran Bomb Would Take '3-8 Years' to Build," *Irish Times*, October 10, 2007, accessed at http://www.irishtimes.com/newspaper/breaking/2007/1022/breaking29.html, on January 4, 2009.

Concerns over Iran's pursuit of a nuclear capability were heightened by the discovery of an underground Pakistani nuclear proliferation network, headed by the "father" of the Pakistani nuclear bomb, Abdul Qadeer Khan, often referred to as A.Q. Khan. Throughout the 1980s and 1990s, aided by people on four different continents, Khan managed to buy and sell nuclear components to Libya, North Korea, and Iran, and offered to do so for Iraq, Egypt, Saudi Arabia, and Syria, despite existing NPT monitoring and compliance regimes. Remarkably—and disturbingly—US and foreign intelligence agencies failed to unearth and penetrate Khan's network until 2000, which ultimately led to the 2003 seizure of uranium-enrichment gas-centrifuge components being shipped to Libya. When confronted with the evidence, and under intense pressure from the United States, Libya agreed to renounce its nuclear program. In addition, Tripoli provided information which led to Khan's arrest and the dismantling of his network. Experts were surprised by the network's global reach, and stunned that it could operate so freely despite apparent widespread support for the NPT. As one nuclear-terrorism expert observed:

> The fact that a very small number of individuals—nobody believes that A.Q. Khan was acting alone—can create a network that provides some of the most worrisome states on the planet with the technology needed to produce nuclear weapons is very troubling. It shows that the NPT regime is only as strong as its weakest links. We can secure 90 percent of the nuclear material to very high levels, but if the other 10 percent is vulnerable to theft, we still won't have solved the problem because we're dealing with intelligent adversaries who will be able to find and exploit the weak points.[18]

Still another expert concludes

> Arms control regimes are not capable of dealing with the hard cases. The logic of the NPT doesn't get you very far in Tehran or Pyongyang. It's not going to matter to India or Pakistan, which have their own fish to fry. . . . I'm afraid we're rapidly approaching a situation in which there are more nuclear-weapons states outside the NPT than inside, and the treaty itself provides no way whatsoever of addressing that problem.[19]

Since 1998 the world has witnessed the progressive nuclearization of Asia as India, Pakistan and North Korea have joined China, Israel and Russia as members of the continent's nuclear-armed club, while Iran continues its worrisome nuclear activities.

To sum up, since 1998 the world has witnessed the progressive nuclearization of Asia as India, Pakistan and North Korea have joined China, Israel and Russia as members of the continent's nuclear-armed club, while Iran continues its worrisome nuclear activities. Stimulated by Iran's efforts, six other states in the region—Egypt, Saudi Arabia, Bahrain, Qatar, Jordan, and the United Arab Emirates—have already sought nuclear partnerships with the United States, Russia, and France to acquire

---

[18] Matthew Bunn, quoted in Mary H. Cooper, "Nuclear Proliferation and Terrorism," *CQ Researcher*, April 2, 2004, p. 301.

[19] John Pike, quoted in Mary H. Cooper, "Nuclear Proliferation and Terrorism," *CQ Researcher*, April 2, 2004, p. 301.

nuclear technology.[20] Moreover, the inability of the world's leading intelligence agencies and the IAEA to uncover an underground globe-spanning nuclear proliferation network, even though it had been operating for over a decade, offers little encouragement that the international community can effectively identify breaches in the NPT, let alone enforce its writ.

The attacks of September 11, 2001 and the progressive weakening of the NPT regime led President George W. Bush to declare that the greatest danger facing the United States was "the world's most dangerous people" (e.g., violent extremists and terrorists) getting their hands on "the world's most dangerous weapons" (i.e., nuclear weapons).[21] The reasons are clear. As one expert notes, "The worst potential WMD problem is nuclear terrorism, because it combines the unparalleled destructive power of nuclear weapons with the apocalyptic motivations of terrorists against which deterrence, let alone dissuasion or diplomacy, is likely to be ineffective."[22]

The explosion of a nuclear weapon on US territory would be a momentous, catalytic event, representing more a "12/7" event than a "9/11" event.[23] The Department of Homeland Security concludes that a single, catastrophic nuclear attack (e.g., employing a fission weapon) might cause *at least* ten thousand casualties and 50-100 billion dollars in economic damage, and would produce a "major global policy shift."[24]

Terrorist groups are well aware of the potentially devastating effects of nuclear weapons and other weapons of mass destruction, and are actively seeking to acquire them. Osama bin Laden has declared:

> Acquiring weapons for the defense of Muslims is a religious duty. If I have indeed acquired these weapons, then I thank God for enabling me to do so. And if I seek to acquire these weapons, I am carrying out a duty. It would be a sin for Muslims not to try to possess the weapons that would prevent the infidels from inflicting harm on Muslims.[25]

The inability of the world's leading intelligence agencies and the IAEA to uncover an underground globe-spanning nuclear proliferation network offers little encouragement that the international community can effectively identify breaches in the NPT, let alone enforce its writ.

---

[20] Tariq Khaitous, "Why Arab Leaders Worry About Iran's Nuclear Program," *Bulletin of the Atomic Scientists,* May 23, 2008, accessed at http://www.thebulletin.org/web-edition/features/why-arab-leaders-worry-about-irans-nuclear-program, on January 4, 2009.

[21] Fareed Zakaria, "Tackle the Nuke Threat," *Newsweek*, June 21, 2004.

[22] Ashton Carter, "How to Counter WMD," *Foreign Affairs*, September-October 2004, accessed at http://www.foreignaffairs.org/20040901faessay83507/ashton-b-carter/how-to-counter-wmd.html, on January 4, 2009.

[23] The reference to "12/7" is, of course, to the Japanese surprise attack on Pearl Harbor which, among other things, brought about the full mobilization of the United States for war; the waging of total war for the purpose of the enemy's total destruction; the harnessing of the nation's industrial might to produce weapons on an unparalleled scale and with unprecedented destructive power; and a fundamental shift in the country's orientation from a neo-isolationist power to assuming enduring active role as the world's leading power. The impact of 9/11 seems miniscule by comparison.

[24] Steve Coll, "The Unthinkable," dated March 12, 2007, accessed at http://www.newyorker.com/reporting/ 2007/03/12/070312fa_fact_coll? on January 4, 2009.

[25] Cited in Donald Rumsfeld, *2006 Quadrennial Defense Review Report* (Washington, DC: Department of Defense), p. 33.

While bin Laden spoke these words a decade ago, there is no evidence to suggest that al Qaeda or any other terrorist organization has acquired any nuclear weapons; nevertheless, they actively continue to seek them.

Concerns over the threat of nuclear terrorism are widespread in the international community. In 2006, President Bush and Russian President Vladimir Putin announced the Global Initiative to Combat Nuclear Terrorism, the objective of which is to reinforce controls over nuclear facilities and materials in order to prevent terrorist groups from accessing them. Over seventy countries have joined the initiative, including all five original NPT nuclear states. This effort is complemented by the broader Proliferation Security Initiative (PSI), "a global effort that aims to stop trafficking of weapons of mass destruction (WMD), their delivery systems, and related materials to and from states and non-state actors of proliferation concern."[26] The Nuclear Suppliers Group (NSG), formed in the wake of India's "peaceful" nuclear test in 1974, also continues its efforts to reduce the prospects for nuclear proliferation. The NSG works to control the transfer of materials associated with nuclear weapons development.

There is no evidence to suggest that al Qaeda or any other terrorist organization has acquired any nuclear weapons; nevertheless, they actively continue to seek them.

Nevertheless, the NPT's three pillars—a commitment to keep nuclear weapons from members who do not possess them, a commitment to nuclear disarmament from members who do possess them, and a commitment not to withhold nuclear technology from NPT signatories for non-military purposes—are under serious strain. As noted above, several NPT members—North Korea and Iran in particular—appear to have used, or may be using, the treaty's provisions for the transfer of nuclear technology for non-military purposes to assist their nuclear weapons program. The United States' efforts to block the transfer of nuclear technology to Iran is viewed by some as a violation of its obligations under the treaty, despite Tehran's likely use of the technology to support a nuclear weapons program. The waters are further muddied by the United States' willingness to transfer nuclear technology to India, which is not an NPT member and which has developed a nuclear arsenal.[27]

Finally, all five of the nuclear-armed signatories to the NPT save the United States are taking steps to modernize their nuclear forces, actions that in the eyes of some violate their obligations to pursue nuclear disarmament. While the two nuclear superpowers, the United States and Russia, have radically reduced their nuclear arsenals since the Cold War's end, there is growing pressure for both countries to engage in substantial additional reductions with the ultimate goal of meeting the NPT's com-

---

[26] US Department of State, "Proliferation Security Initiative," accessed at http://www.state.gov/t/isn/c10390.htm, on January 4, 2009.

[27] This action is viewed by some as a violation of the Nuclear Suppliers Group agreement, which bans the transfer of nuclear technology to states that are not members of the NPT. Recently the NSG granted the United States a waiver allowing it to proceed with its agreement with India.

mitment to nuclear disarmament.[28] This is reflected in the statements of former senior US national security policymakers such as Henry Kissinger, Sam Nunn, William Perry, and George Shultz who advocated a major effort to create "a solid consensus for reversing reliance on nuclear weapons globally as a vital contribution to preventing their proliferation into potentially dangerous hands, and ultimately ending them as a threat to the world."[29]

[28] The United States is estimated to have a stockpile of roughly 5,400 nuclear warheads, including over 1,200 held in its inactive stockpile. It plans to reduce this stockpile by another 15 percent by 2012, or to a level around 4,500 weapons. Twenty years ago the US nuclear weapons stockpile was estimated at roughly 24,000 weapons. Robert S. Norris and Hans M. Kristensen, "US Nuclear Forces, 2008," *Bulletin of Atomic Scientists*, March-April 2008, pp. 50-51. The number of weapons in the US nuclear arsenal has been declining for over 40 years, since it peaked at some 32,500 in 1967. See "The Nuclear Weapons Archive," accessed at http://nuclearweaponarchive.org/Nwfaq/Nfaq7-2.html#usa, on January 6, 2009. As of 2007, Russia is estimated to have some 5,200 operational nuclear weapons out of a total of roughly 14,000 weapons in its arsenal. Robert S. Norris and Hans M. Kristensen, "Russian Nuclear Forces, 2008," *Bulletin of Atomic Scientists*, March-April 2008, pp. 50-51. See also Adrian Blomfield, "Russia's Nuclear Capabilities," June 5, 2007, accessed at http://www.telegraph.co.uk/news/worldnews/1553598/Russia%27s-nuclear-capabilities.html. Russia's nuclear arsenal peaked in 1986 at some 45,000 weapons. See Natural Resources Defense Council, accessed at http://www.nrdc.org/nuclear/nudb/datab10.asp, on January 6, 2009.

[29] George P. Shultz, William J. Perry, Henry A. Kissinger and Sam Nunn, "A World Free of Nuclear Weapons," accessed at http://www.hoover.org/publications/digest/6731276.html, on January 6, 2009.

CHAPTER 2 > **THE SECOND NUCLEAR REGIME**

There is no stark dividing line between the first and second Nuclear Regimes, certainly nothing comparable to the pre-nuclear era and the First Regime. It can be argued that there have been a number of discrete periods in the nuclear age, for example, the period prior to the fielding of thermonuclear weapons, the period following their introduction, or the period of US nuclear monopoly prior to the Soviet Union's acquisition of nuclear weapons. For the purposes of this paper, the First Nuclear Regime is defined as the period of intense nuclear rivalry between the United States and the Soviet Union, i.e. the Cold War. The timeframe is roughly 1946-1991, some forty-five years. The Soviet Union's collapse brought about the biggest shift in the geopolitical environment since World War II. Not surprisingly, it exerted considerable influence on the balance of power, and increased the willingness of some states to pursue nuclear weapons.

Since the end of the Cold War, the incentives to pursue nuclear weapons appear to have outweighed the incentives to forego them. From 1974 to the Cold War's end in 1991, a period of seventeen years, with the exception of South Africa, no state joined the nuclear club, even though many states had significant nuclear weapons programs, among them Algeria, Libya, Iran, Iraq, South Korea and Taiwan. But over the past seventeen years India, North Korea and Pakistan have demonstrated a nuclear weapons capability, while Iran and Syria appear intent on joining them, and several other Arab states have expressed a renewed interest in nuclear energy development, ostensibly for peaceful purposes. It is this current environment that constitutes the Second Nuclear Regime.

What are the principal characteristics of the Second Nuclear Regime, and which ones differentiate it from the first? What are the implications of these characteristics for US security in terms of the challenges (and opportunities) they may present? The remainder of this chapter is devoted to addressing these issues.

A MULTI-DIMENSIONAL COMPETITION

The First Nuclear Regime was very much dominated by the competition between the United States and the Union of Soviet Socialist Republics (USSR), two states that had (and still have) the overwhelming preponderance of the world's nuclear weapons. Moreover, the other declared nuclear-armed states were either close allies of the United States (in the case of France and Great Britain) or possessed relatively few nuclear weapons (in the case of China). Israel, the principal undeclared nuclear armed state, was arguably a *de facto* ally of the United States.

We may be moving toward a multidimensional "n-player" game. The dynamics of such a competition are not nearly as well understood as the two-player dynamic that characterized the First Nuclear Regime.

Unlike the First Nuclear Regime, which could be viewed from the perspective of a two-player competition, the Second Nuclear Regime is characterized by a growing number of nuclear powers, most of which are either generally hostile to the United States or geopolitically aloof. Today, the First Nuclear Regime superpowers retain their dominance in the number of nuclear weapons; however, the number of nuclear-armed states has grown significantly. Of note, none of the new nuclear powers is a close ally of either major nuclear power. At least one of the new nuclear powers, North Korea, is unremittingly hostile toward the United States, as are several aspiring nuclear states, to include Iran and Syria. Others, like India and Pakistan, while on reasonably good terms with the United States, can hardly be called allies in the same sense as Britain and France.

Moreover, several of these states—North Korea and Pakistan in particular—are relatively unstable. Adding to the complexity of the situation, both of these nuclear powers have links to terrorist groups, as do Iran and Syria.[30] In this regard, the competition bears little resemblance to that of the First Nuclear Regime, which centered almost exclusively on the two nuclear superpowers. We may be moving toward a multidimensional "n-player" game, as will be discussed presently. If Iran becomes a nuclear-armed state this could be the catalyst for an additional round of proliferation involving several Arab states, which would create an even more complex environment. The dynamics of such a competition are not nearly as well understood as the two-player dynamic that characterized the First Nuclear Regime. For example, during the Cold War the United States concerned itself with how its actions relating to its nuclear force posture would influence the Soviet Union and, to a lesser extent, its allies. Now steps taken to address one form of the problem, such as Iran's prospective nuclear weapons capability, must also be viewed in the context of how they might influence the actions of other nuclear powers, such as Russia. For example, US plans to deploy missile defenses in Europe to defend against the threat of an Iranian attack have met with stiff opposition from Moscow. Thus it becomes more difficult

[30] To be sure, during the Cold War both the Soviet Union and China had links to terrorist organizations, but never transferred nuclear weapons to terrorist groups. Nor was it a serious concern on the part of Western policy makers. However, they were both relatively stable regimes when compared to the Russia of today, and certainly when compared to North Korea and Pakistan. Moreover, it is generally agreed that the risk of nuclear state failure is much higher today than during the Cold War.

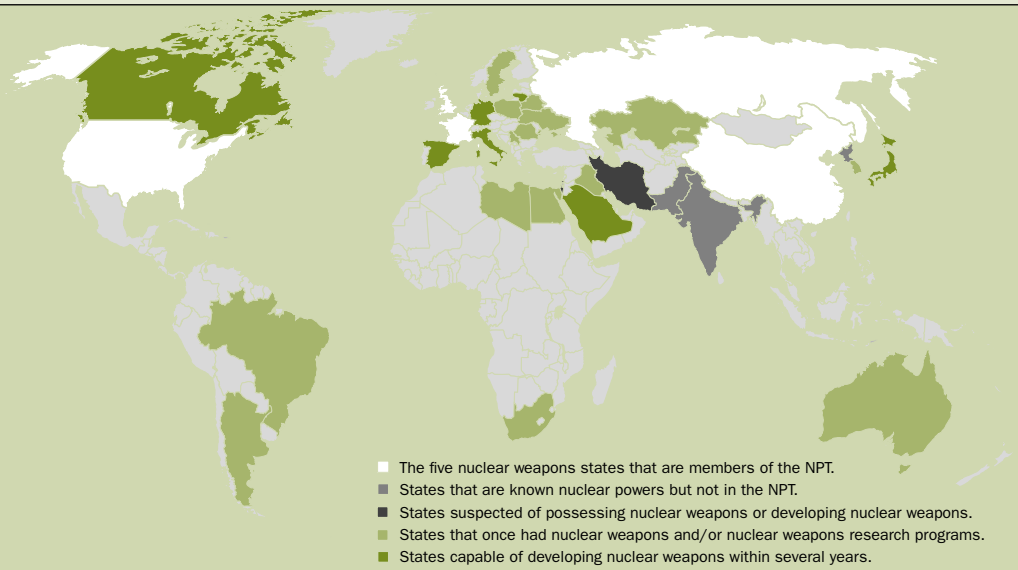
to optimize a particular strategy around one rival, as actions taken to influence one competitor may have significant second-order effects. This issue will be elaborated upon later in this assessment.

Interestingly, most of the newly armed nuclear states such as India and (especially) North Korea were generally aligned with the Soviet Union during the Cold War. Others, such as Iran, Iraq, and Syria also often sided more closely with Moscow than Washington. The Soviet Union's collapse may have provided these countries with a greater incentive to pursue nuclear weapons. Revealingly, none of America's Cold War-era partners has moved to develop a nuclear weapons capability, even though many (e.g., Germany, Italy, Japan, South Korea, Taiwan) clearly have the technical ability to do so. This may reflect the United States' victory in the Cold War, which seems to have reassured its allies and friends while perhaps also encouraging the clients of the former Soviet Union to seek their security in the form of nuclear weapons.

Four of the five declared nuclear powers during the First Nuclear Regime were part of the Western world. The Second Nuclear Regime finds us moving from a world dominated by advanced industrial powers centered in Europe and America to a world populated by Third World Asian states (i.e., India, Pakistan, North Korea), with more Asian states (i.e., Iran, Algeria, Egypt, Saudi Arabia and Syria) poised to follow. Thus in coming to grips with an n-player competition, it will be essential to develop an understanding of the way in which the leaders of very different cultures (e.g. Hindu, Muslim) view nuclear weapons. To date the United States has not devoted anything approaching the level of intellectual effort to this matter that it did to understanding Soviet views on nuclear forces during the Cold War. Such an effort is necessary if US strategy with respect to nuclear forces is to shape the actions of other nuclear powers, to include deterring their use.

The United States has not devoted anything approaching the level of intellectual effort to this matter that it did to understanding Soviet views on nuclear forces during the Cold War.

FIGURE 2. **A MULTIPOLAR NUCLEAR WORLD**



POTENTIAL VARIATIONS IN NUCLEAR FORCE POSTURES

The First Nuclear Regime was dominated by the US-Soviet competition. While their force postures were hardly identical, they were remarkably similar. Both sides relied on a triad of delivery systems, although the Soviets placed far more emphasis on land-based missile forces than the Americans. Both sides continually improved their capabilities, with the Soviets typically just a step behind the Americans in developing thermonuclear bombs, solid-fuel ballistic missiles, submarine-launched ballistic missiles, multiple independently targetable reentry vehicles (MIRVs), and ballistic missile defenses, among other capabilities. The series of arms control treaties between the two powers—the two Strategic Arms Limitation Treaties (SALT), the Antiballistic Missile (ABM) Treaty and the Intermediate Range Nuclear Forces (INF) Treaty, for example—helped to sustain this rough symmetry.

In both form and scale, the nuclear arsenals of the existing and emerging nuclear powers are almost certain to exhibit far greater diversity than the First Nuclear Regime superpower arsenals. These differences will be driven by the wide variations that exist between the current nuclear powers, as well as by likely proliferants, in their resources, technical limitations, security needs, culture, decision-making processes and the absence of any mechanism (such as arms control) to enforce a level of symmetry.

Relative to the established nuclear states, especially the United States, Britain, France and Russia, relative newcomers to the nuclear club will very likely have far smaller arsenals and less sophisticated delivery systems. They will also likely be limited to earlier generation nuclear weapon designs. Thus while the advanced nuclear powers have all successfully detonated thermonuclear (hydrogen) bombs, India, Pakistan and North Korea have yet to do so.[31] The advanced nuclear weapon states can far more easily design nuclear earth-penetrator weapons, advanced electromagnetic pulse (EMP) generator weapons, and other weapons that boost specific effects, such

[31] India claims to have tested a hydrogen bomb as part of its series of five tests in May 1998, but this claim is disputed.

as the enhanced radiation warhead (ERW)[32] and weapons optimized to produce high levels of fallout,[33] which have apparently been eschewed by the advanced powers.

There is, and is likely to persist for some time, great variety in nuclear weapons delivery systems among the nuclear-armed states and likely proliferant states. Lacking the means to field and sustain expensive, sophisticated ballistic missiles, submarines and aircraft, minor nuclear powers like North Korea and Pakistan will necessarily settle for far less than the US triad of delivery systems.[34] On the other hand, they may find novel delivery means such as cargo ships to be useful in delivering nuclear weapons to their targets. Nonstate groups that gain access to nuclear weapons may employ even more unconventional ways of executing their attacks.

Not only will delivery systems vary significantly, but the accuracy of these systems is also likely to vary, perhaps widely, with the less technically sophisticated nuclear-armed powers having aircraft and missiles of relatively poor accuracy compared to an

---

[32] Nuclear weapons generate blast, heat and radiation. As the name indicates, an enhanced radiation weapon boosts the output of radiation relative to the blast of a standard nuclear weapon. Thus enhanced radiation weapons can reduce collateral damage while still inflicting high casualties. The ERW was seen during the Cold War as potentially very effective against armored forces, whose troops were relatively well protected from nuclear blast and heat effects, and less so with respect to radiation effects.

[33] One such weapon is the so-called Cobalt Bomb, popularized by the physicist Leo Szilard in 1950. Szilard argued that, in theory, a nuclear weapon employing cobalt (or several other isotopes, such as gold-197, tantalum-181, and zinc-64) as a tamper could generate such a persistent, intense level of radioactive fallout as to be capable of destroying all human life on Earth. Although the mass required to generate such an effect has been estimated at over 500 tons, it is theoretically possible to build such a weapon similar to the "doomsday machine" popularized in the motion picture, *Dr. Strangelove*. In theory, such a weapon, if rigged to detonate automatically in the event of a devastating attack on one's country, could represent the ultimate deterrent. Depending upon a range of factors, a minor nuclear power could conceivably build a Cobalt Bomb of relatively modest size to address threats from its neighbors. "Hydrogen Bomb," *The Columbia Encyclopedia*, Sixth Edition, 2008, accessed at http://www.encyclopedia.com/doc/1E1-hydrogn-bm.html, on January 9, 2009. See also "Uranium and Dirty Bombs," Federation of American Scientists, accessed at http://www.fas.org/programs/ssp/nukes/armscontrol/uraniumdirtybombs.html, on January 9, 2009.

[34] Designing a nuclear weapon is one thing; designing such a weapon small enough to fit on a ballistic missile requires an advanced design. Apparently there are efforts under way by minor nuclear powers to obtain the technology and the designs to accomplish this task. With their much shorter flight times than those of aircraft, ballistic missiles are generally considered destabilizing weapons, as they greatly reduce the warning time of an attack. In 2004 Swiss investigators seized computer files and documents belonging to several Swiss nationals. The files contained over one thousand megabytes of encrypted information believed to be the designs for nuclear warheads sufficiently small to fit on a ballistic missile. These Swiss smugglers had links to the notorious Pakistani nuclear engineer, A. Q. Khan. It is unknown whether these plans were provided to A. Q. Khan or sold to countries like North Korea and Iran, which would very likely have a strong interest in acquiring them. There were reports that the blueprints were based on a Chinese nuclear weapon design that dated to the mid-1960s. However, the design found on the computers in Switzerland, (and which was also reportedly discovered on computers in Bangkok and several other cities around the world) is far more advanced than the Chinese weapon. Since the design is in electronic form, it is easy to copy. Investigators have no idea how many copies of it are now in circulation. David Albright, "Swiss Smugglers Had Advanced Nuclear Weapons Designs," Institute for Science and International Security, June 16, 2008, accessed at http://www.isis-online.org/publications/expcontrol/Advanced_Bomb_16June2008.pdf, on January 11, 2009; and David Sanger, "Nuclear Ring Reportedly Had Advanced Design, *New York Times*, June 15, 2008, accessed at http://www.nytimes.com/2008/06/15/world/asia/15nuke.html?_r=1&partner=rssuserland&emc=rss&pagewanted=all, on January 11, 2009.

advanced nuclear power like the United States. Owing to accuracy limitations, more technically challenged nuclear powers may have incentives to focus on area targets such as cities, rather than point targets such as enemy military bases or WMD storage sites. That being the case, weapon yield will likely be important to these states: the bigger the yield, the less the need for accuracy. (Indeed, the United States' nuclear arsenal equivalent megatonnage has declined dramatically since the early 1960s, as improvements in missile guidance reduced the need for high yields.) Given the leap in destructive power between fission weapons (atomic bombs) and fusion or thermonuclear weapons (hydrogen bombs), new nuclear powers may accord high priority to pursuing the latter to offset their shortcomings in delivery accuracy, as well as to enhance the destructive potential at their disposal.

More technically challenged nuclear powers may have incentives to focus on area targets such as cities.

DEFENSES

During the early stages of the Cold War, before the two superpowers had built up their arsenals and created a period of "nuclear plenty," and before they had mastered ballistic missile technology, there were serious efforts to field effective defenses against atomic attack. The United States, for example, established a vast early warning network to detect a Soviet attack over the North Pole. Some 145 Army air defense sites armed with Nike Hercules interceptor missiles were deployed to defend the continental United States and Alaska from Soviet attack.[35] At its peak, the Air Force deployed some ninety-three active Air Force fighter interceptor squadrons and seventy-six Air National Guard fighter interceptor squadrons to defend the US homeland. These efforts were supported by a national civil defense program intended to buttress the country's passive defenses. During the 1960s, however, as the size of the Soviet ballistic missile arsenal increased, it became clear that the principal threat of attack no longer rested with Soviet long-range bombers. The inability to develop effective defenses against ballistic missiles led to the disbanding of most defenses against air attack and the abandonment of the US Safeguard antiballistic missile (ABM) system.[36] America's missile defense efforts were limited to research and development programs, the most notable of which was the Strategic Defense Initiative (SDI) spawned in 1983 at the direction of President Ronald Reagan. Interestingly, the Soviet Union did not share the United States' loss of confidence in air and missile defenses, and continued to devote

[35] "Nike Hercules," accessed at http://www.astronautix.com/lvs/nikcules.htm on January 20, 2009.

[36] The Safeguard ABM system was ultimately designed not to defend the United States from nuclear attack, but to protect the country's intercontinental ballistic missile (ICBM) force from a surprise attack sufficiently well to enable it to execute a retaliatory strike against the Soviet Union following such an attack. See "Safeguard," accessed at http://www.fas.org/spp/starwars/program/safeguard.htm on January 20, 2009.

substantial resources to improving both.[37] In a multipolar nuclear world, one might anticipate widely divergent views on the value of defenses in general, and of specific kinds of defenses in particular.

In some respects the Second Nuclear Regime resembles the early days of the First Nuclear Regime, in that a number of the new nuclear powers (for example, Pakistan, North Korea) and prospective nuclear powers (e.g., Algeria, Egypt, Iran, Saudi Arabia, Turkey) have, or are likely to have, relatively small arsenals due to resource constraints or simply the time required to field large nuclear forces. This recalls the 1950s and early 1960s when the Soviet Union had relatively small numbers of weapons and delivery systems, and the United States fielded large-scale defenses.[38]

Given that in some contingencies the challenge may be to defend against a few dozen missiles, and not a thousand or more, the Second Nuclear Regime offers the prospect of a renaissance for defenses against ballistic missile attack, and against attacks from air-breathing delivery systems such as aircraft and cruise missiles. In an increasingly proliferated world, the advanced nuclear powers—and the United States in particular—have the potential to field relatively effective defenses against minor nuclear powers. Defenses also need to be considered in addressing the prospect of nonstate entities gaining possession of nuclear weapons and attempting to deliver them to their target through unconventional means.[39]

Ballistic missile defense technology has yet to advance far enough to make defenses attractive in dealing with the threat of a massive attack on population centers. However, they may prove valuable in addressing the risks posed by a state with a few dozen nuclear-armed ballistic missiles. Such defenses, even if they are only partially effective (e.g., with individual interceptors capable of only a 50 percent intercept success rate), may be sufficient to deal with an accidental launch of a few missiles by any

Given that the challenge may be to defend against a few dozen missiles, the Second Nuclear Regime offers the prospect of a renaissance for defenses against ballistic missile attack.

[37] Moscow not only maintained a massive air defense network, but deployed the missile defense system permitted by the 1972 ABM Treaty. (The United States unilaterally withdrew from the Treaty in 2002.) Beginning in the late 1970s, the Soviet Union began constructing a missile defense phased-array radar at Krasnoyarsk, in violation of the ABM Treaty. The radar was eventually dismantled.

[38] At the time of the Cuban Missile Crisis in October 1962 the Soviet Union had only 38 warheads atop its ICBM fleet, while the United States had some 213 warheads on its ICBM force. National Resources Defense Council, "Archive of Nuclear Data," accessed at http://www.nrdc.org/nuclear/nudb/datainx.asp on January 20, 2009. See also Michael Dobbs, *One Minute to Midnight* (New York: Alfred A. Knopf, 2008), p. 45.

[39] For a detailed treatment of defenses against nonstate groups armed with nuclear weapons, see CSBA's Strategy for the Long Haul report by Evan Montgomery, *Nuclear Terrorism: Assessing the Threat, Developing a Response* (Washington, DC: CSBA, 2009).

Recent advances in directed energy weapon (DEW) technology may enable directed-energy missile defenses to finally come of age, after years of being derided as "interesting toys."

state, or deflect a sizeable portion of a full-scale nuclear strike by a minor nuclear power on American cities.[40]

Recent advances in directed energy weapon (DEW) technology may enable directed-energy missile defenses to finally come of age, after years of being derided as "interesting toys."[41] A recent report by the Department of Defense (DoD) Defense Science Board (DSB) found that "directed energy continues to offer promise as a transformational 'game changer'....yet years of investment have not resulted in any currently operational high-energy laser capability."[42] While the DSB sees potential for DEW to support a wide range of military missions, it concludes that until military commanders generate "operational demand" for such systems, "there is little reason to expect rapid progress in fielding such systems."[43] Thus the problem with respect to deploying at least some DEW systems may increasingly have less to do with technological barriers and more with institutional preferences.

However, given that the competition between missiles and missile defenses heavily favors the offense, most nuclear powers will likely devote their resources to fielding secure second-strike nuclear forces. Thus missile defenses are unlikely to prove a cost-effective means of ensuring a secure second-strike capability, when compared to fielding additional nuclear forces, dispersing nuclear forces (e.g., in submarines at sea), or hardening nuclear forces (e.g., in missile silos). Absent effective defenses

---

[40] For example, assume a missile defense system armed with interceptors, each possessing a 0.5 probability of kill (PK). If such a system were to engage a single enemy warhead, and if three interceptor missiles were fired at the incoming warhead, the chances of a successful intercept would be 87.5 percent. The decision to deploy such a system is a matter of judgment. How concerned are we of the dangers of an accidental launch? Or that a nuclear rogue state would risk annihilation by attacking the United States? Or that the warhead would be sufficiently accurate to strike a city? Or that the cost of fielding such a system would be outweighed by the risks of not deploying it? Or that there might be some unintended consequences—second-order effects—stemming from the reaction of other nuclear powers to a US missile defense deployment?

[41] The term "interesting toys" was used by a former US defense secretary in a conversation with the author in describing directed energy weapons.

[42] Defense Science Board, *Task Force on Directed Energy Weapons* (Washington, DC: Office of the Under Secretary of Defense for Acquisition, Technology and Logistics), December 2007, p. vii.

[43] Defense Science Board, *Task Force on Directed Energy Weapons*, p. iii. The Defense Department's current emphasis is being placed on a megawatt-class Chemical Oxygen Iodine Laser (COIL) housed aboard a modified Boeing 747-400 aircraft. The laser is designed to intercept ballistic missiles in their boost phase (i.e., before they leave the atmosphere); however, the Airborne Laser (ABL) program has been beset with difficulties. See Missile Defense Agency (MDA) Fact Sheet, "The Airborne Laser," June 2008, accessed at http://www.mda.mil/mdalink/pdf/laser.pdf on January 20, 2009. Rapid advances are being made in the area of solid-state lasers (SSLs), which promise to be far smaller and lighter than chemical lasers. The Pentagon's flagship effort, known as the Joint High-Power Solid-State Laser (JHPSSL) program, is currently in the early stages of development. Several defense firms are competing to develop a 100-kw. Solid-state lasers under JHPSSL. Lasers at the 100 kw power level are believed to have significant military utility, to include intercepting projectiles such as cruise missiles. However, intercepting ballistic missile warheads will likely require substantially greater power levels. Graham Warwick, "Solid-State Laser Programs Advance," Aviation Week, January 11, 2009. Accessed at http://www.aviationweek.com/aw/generic/story_generic.jsp?channel=awst&id=news/aw011209p1.xml on January 20, 2009.

or a secure second-strike capability, a state's nuclear posture could gravitate toward pre-emption.

As technology associated with missile defense progresses, so does technology for the offense. It is likely that maneuverable reentry vehicle (MARV)[44] technology will spread to states fielding (or looking to field) ballistic missile forces armed with nuclear warheads. More advanced means of penetrating defenses (e.g., MARVs) will likely proliferate over time. Interestingly, in their effort to defeat traditional kinetic missile defense interceptors by deploying MARVs, states make themselves more vulnerable to intercept by directed energy systems, such as lasers. The reason for this is that, in the process of maneuvering, MARVs take longer to get to their target than do warheads on a ballistic trajectory, thereby increasing the potential dwell time for a DEW beam on the warhead. A basic limitation of any directed-energy weapon, however, is that it must illuminate or "dwell" on a booster for some time to destroy it. The longer the DEW dwell time, the greater the chance that a warhead will be destroyed.

Interestingly, in their effort to defeat traditional kinetic missile defense interceptors by deploying MARVs, states make themselves more vulnerable to intercept by directed energy systems.

Finally, as noted earlier, in a multipolar nuclear world there is the prospect that defenses fielded to address the threat may affect the calculations of other rivals in undesirable ways. This is true in the case of missile defenses. The United States' plans to deploy theater missile defenses in Europe to create a defense shield against the growing threat of Iranian ballistic missiles and its nuclear weapons program are viewed by Russia as a threat to its missile forces, and Moscow has threatened to take offsetting measures if the US missile defense system is deployed.[45] These second-order effects are likely to be far more pervasive, and more significant, than was the case during the First Nuclear Regime, when US strategists had the "luxury" of focusing nearly all of their attention on one rival.

---

[44] A MARV is a reentry vehicle (e.g., nuclear warhead) capable of performing preplanned flight maneuvers during its reentry phase into the earth's atmosphere. The United States developed MARVs during the Cold War to stress Soviet ballistic missile defenses, since a maneuvering target is more difficult to track and intercept than one following a predictable ballistic trajectory. Russia's testing of its SS-25 Topol ICBM in December 2007 is believed to have employed MARVs. Ronald O'Rourke, one of the foremost experts on the US Navy, stated in November 2008 that the Defense Department and other analysts believe China is developing anti-ship ballistic missiles (ASBMs) with MARVs. See http://www.dtic.mil/doctrine/jel/doddict/data/m/03207.html, accessed on January 23, 2009. Sea also Stratfor, "Russia: Maintaining the Credibility of Deterrence," December 10, 2007, accessed at http://www.stratfor.com/analysis/russia_maintaining_credibility_deterrence, on January 23, 2009; and Michael Richardson, "Beijing Takes Aim at US Aircraft Carriers," *Japan Times*, January 22, 2009, accessed at http://bbs.chinadaily.com.cn/viewthread.php?gid=2&tid=625967, on January 23, 2009.

[45] Poland has agreed to permit the United States to deploy ballistic missile interceptor missiles at a base on the Baltic Sea, and the Czech Republic has approved US plans to construct a radar station on its territory. The deals form part of US plans for a European missile defense shield to counter what it describes as the threat from "rogue states" such as Iran. Iran recently carried out new tests of its Shahab-3 ballistic missile, which reportedly has a range of 2,000 km (1,240 miles). The United States disputes Russia's contention that the proposed missile defense shield presents a significant threat to the Russian nuclear forces. BBC, "Q&A: US Missile Defense," August 20, 2008, accessed at http://news.bbc.co.uk/2/hi/europe/6720153.stm, on January 23, 2009. See also US Department of Defense, US Department of State, "Proposed US Missile Defense Assets in Europe," n.d., accessed at http://www.aic.cz/cms/md706-brochure.pdf on January 23, 2009.

PARTIAL DISPLACEMENT OF NUCLEAR WEAPONS

With the development of weapons whose accuracy is increasingly independent of the range over which they are fired, some advanced nuclear powers have the potential to substitute, on a limited basis, non-nuclear weapons (e.g., guided weapons, or precision-guided weapons (PGMs)) for nuclear weapons. Simply stated, until relatively recently, limitations on weapon accuracy required using nuclear weapons to guarantee the prompt destruction of key point targets. The enormous yield of nuclear weapons meant they could miss a target by a considerable distance and still destroy it. With the arrival of the Guided Weapons Era, it is possible to contemplate employing PGMs against certain targets that would previously have required nuclear weapons to achieve the same confidence of destruction or neutralization.[46]

The effectiveness of aerial bombardment has increased dramatically with the introduction of guided weapons. In World War II the US Eighth Air Force aerial bombardment campaign against Germany succeeded in destroying some fifty strategic targets in all of 1943. During the First Gulf War, aircraft employing PGMs

[46] The commander of the US air campaign in the First Gulf War, General Charles Horner, was the first to employ precision-guided munitions intensively in an air campaign. So effective were these munitions that Horner was moved to assert that the only targets that nuclear weapons were suitable for in the Guided-Weapons Age were cities. As the general put it: "During the [First] Gulf War I said to myself , what would I use these [nuclear] weapons for? How would I use them? We weren't gonna do it, but I had to say to myself, if I was asked to do it, what would I do? So I sat down with a nuclear [weapons] planner, and he got his computer models and we ran them and ran them. The only thing nuclear weapons were good for, really, was busting cities. And if we go around killing women and children in cities, we've lost the war."

"Now With Bill Moyers," Public Broadcasting System, April 2, 2004, accessed at http://www.pbs.org/now/transcript/transcript314_full.html, on January 9, 2009. General Horner's endorsement of precision-guided weapons over nuclear weapons failed to take into account several important factors. One is that nuclear weapons may be needed to hold cities at risk of destruction, especially against a nuclear-armed adversary capable of destroying one's own cities. Another is that if it is indeed necessary to destroy a target with high confidence and to do it promptly, limitations on even US battle damage assessment (BDA) capabilities can make it difficult to determine if a precision-guided weapon has done its job. Finally, the maturation of the Guided Weapons Era has found rivals taking steps to thwart their effective use, one of which is to place key assets deep underground where they cannot be reliably destroyed even by the most powerful conventional warheads.

were able to destroy roughly three times as many targets on the conflict's first day—a two-order-of-magnitude increase in conventional strategic-strike capability.[47]

Since the First Gulf War, the United States' ability to develop and field large numbers of guided weapons has given it a distinct advantage over its adversaries, which lack both the numbers of munitions and the delivery systems (e.g., missiles, strike aircraft) to employ them over extended ranges. This may change over the next decade or so, with the United States losing its near-monopoly in this area of warfare. In any event, it appears that some states may be seeking nuclear weapons as a way to offset the US advantage in non-nuclear strategic strike capability. Indeed, following the US military's successful use of guided weapons in First Gulf War, India's defense minister voiced the views of many when he declared that no state should contemplate war with the United States unless it first developed nuclear weapons.[48]

To sum up, the US military's fielding of what is viewed by some expert observers, including the former US commander of the First Gulf War air campaign and the defense minister of a relatively new nuclear power, as a nonnuclear strategic strike capability has blurred the distinction between nuclear and non-nuclear weapons. The special status that nuclear weapons have traditionally held may be further compromised with the development of cyber weapons, which are capable of disabling, quickly and (arguably) reliably, certain kinds of strategic targets. The cyberwar waged against Estonia in the spring of 2007 may be a precursor to such a strategic cyber strike, similar to the way in which US use of precision-guided munitions in the latter stage of

The US military's fielding of a nonnuclear strategic strike capability has blurred the distinction between nuclear and non-nuclear weapons.

---

47 On the first night of the Gulf War, coalition forces attacked 144 different targets. On average, each target comprised approximately 2.5 aim points, for a total of 370 aim points. See Keaney and Cohen, *Gulf War Air Power Survey: Planning and Command and Control, Summary Report* (Washington, DC., HQ USAF, 1993), p. 189. See also Christopher Bowie, *Untying the Bloody Scarf: Casualties, Stealth, and the Revolution in Aerial Combat* (Arlington, VA: IRIS Independent Research, 1998), p. 14; and General Ronald R. Fogleman, "Getting the Air Force into the 21st Century," Speech delivered to the Air Force Association's Air Warfare Symposium in Orlando, Florida, on February 24, 1995. Moreover, precision munitions comprised only about seven percent of the conventional munitions employed in bombing attacks during the First Gulf War. According to the Gulf War Air Power Survey conducted following the war, those aircraft employing precision munitions were an *order of magnitude more effective* in terms of target/sortie ratios than aircraft employing unguided ("dumb") conventional bombs. See Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey: Summary Report* (Washington, DC: Government Printing Office (GPO), 1993), p. 243. The ratio was derived by examining 12 representative sorties of F-117 and F-111F aircraft carrying PGMs with 12 sorties flown by aircraft delivering unguided bombs. The former covered 26 targets employing a total of 28 PGMs, while the latter covered two targets, expending 168 bombs.

48 David A. Kay, "Bomb Building in North Korea and the Middle East," George C. Marshall Institute, March 12, 1994, accessed at http://www.marshall.org/article.php?id=187, on January 10, 2009.

the Vietnam War was a distant herald of the Guided Weapons Regime that began in earnest with the First Gulf War.[49]

While precision-guided weapons and cyber weapons complicate thinking about strategic strike operations and the role of nuclear weapons, neither of them can, individually or in combination, displace nuclear weapons' capacity to create destruction and loss of life on a massive scale with a single, highly deliverable package. Nuclear weapons remain the only weapons that can plausibly destroy nations, and perhaps humanity, in a matter of hours. They also remain the only weapons that can destroy, with nearly absolute confidence, any plausible target. Even with advances in precision-guided and cyber weapons, only nuclear weapons can reliably hold at risk of prompt destruction large area targets such as cities.

Even with advances in precision-guided and cyber weapons, only nuclear weapons can reliably hold at risk of prompt destruction large area targets such as cities.

The advent of a Guided Weapons Regime has also stimulated efforts to offset the advantages of precision-guided munitions. As competitors adapt to the use of PGMs, nuclear weapons are making a "comeback" of sorts as the only weapons that may be able to defeat promptly, and with a high degree of reliability, targets such as:

- Highly mobile targets, such as road mobile and rail mobile nuclear missiles;
- Fixed moderately hardened targets, such as missile silos; and
- Deeply buried targets, such as key command centers and WMD storage sites.[50]

Moreover, the United States could employ nuclear weapons for a wide range of missions in addition to targeting populations and industry ("countervalue" targeting). The US nuclear arsenal is designed to hold other target types at risk of destruction: "counterforce" targets, which directly pertain to enemy military capabilities. With the introduction of highly accurate guidance systems, it may be possible to reduce substantially the yield of nuclear weapons against many targets. However, it seems highly

---

[49] In the First Gulf War, more than 17,000 PGMs were expended as opposed to approximately 210,000 unguided bombs. Precision-guided munitions were also employed during the Vietnam War, but far less intensively. More than twice as many laser-guided bombs were dropped during the *six-week* Desert Storm air campaign than against North Vietnam in the *nine-month* long Linebacker operations. Thus one can calculate the intensity of the First Gulf War PGM strikes as being roughly an *order of magnitude greater* in intensity than those conducted during the Vietnam War Linebacker operations. During Linebacker I the Air Force dropped roughly 4,000 PGMs, and the Navy less than 500. Major Robynn C. Rodman, *Hanoi to Baghdad: LINEBACKER's Impact on Modern Airpower* (Maxwell Air Force Base, Alabama: US Air Command and Staff College, April 2006), p. 8.

[50] See Stephen M. Younger, "Nuclear Weapons in the Twenty-First Century," Los Alamos National Laboratory, June 27, 2000, accessed at http://www.fas.org/nuke/guide/usa/doctrine/doe/younger.htm, on January 11, 2009.

unlikely that yield requirements will be reduced to such an extent that conventional explosives will be readily substitutable for nuclear weapons.[51]

In summary, in a world where technology is displacing so much of what came before, including weapons of war, nuclear weapons will continue to cast a long shadow over humankind for the indefinite future.

VARIATIONS IN STRATEGIC TARGET SETS

In a world where technology is displacing so much of what came before, including weapons of war, nuclear weapons will continue to cast a long shadow over humankind for the indefinite future.

During most of the First Nuclear Regime, the United States and the Soviet Union possessed relatively similar target sets. Both countries were large, advanced industrial states with long borders and a relatively well-developed transportation infrastructure. As the world continues its transition away from industry-based economies and toward information-based ones, there will likely be a corresponding shift in the principal sources of military, economic and political power of states. The character of the strategic target base will necessarily change to reflect these developments.[52] Unlike World War II newsreels showing massive bomber raids on steel plants and fire storms ignited by incendiary bombs, or Cold War-era films projecting horrific images in the aftermath of atomic explosions, future strategic warfare may instead capitalize on well-placed conventional and electronic strikes discretely directed against the critical elements, or nodes, of an advanced state's information-based networked economy.

But not all states have an advanced economic infrastructure. As with nuclear forces, the target sets against which nuclear weapons might be employed may vary widely as well, both in scale and form. Large countries like the United States with advanced infrastructures and industrial bases boast a wide range of targets. In addition to the targets associated with traditional, "industrial age" warfare, such as major transportation hubs, military bases and industrial plants, targets such key data processing and routing facilities, servers comprising the Internet backbone, satellite uplinks and

---

[51] In 2003, the US military tested the Massive Ordnance Air Blast (MOAB) bomb, dubbed the "Mother of All Bombs." The munition is estimated to have a yield of roughly ten tons of TNT. The bomb is deployed from a C-130 cargo aircraft and uses GPS guidance. In 2007, the Russian military tested a conventional bomb, dubbed "Tsar Bomba," or the "Father of All Bombs." The bomb has a reported yield of 44 tons, which would make it the world's most powerful conventional bomb. (The fission bomb dropped on Hiroshima is estimated to have had a yield of roughly 13,000 tons.) There is skepticism regarding the yield of the Russian weapon, with some experts arguing that it could be considerably less than stated. "GBU-43/B 'Mother Of All Bombs' MOAB—Massive Ordnance Air Blast Bomb," accessed at http://www.globalsecurity.org/military/systems/munitions/moab.htm, on January 11, 2009. Luke Harding, "Russia Unveils the Father of All Bombs," The Guardian, September 12, 2007, accessed at http://www.guardian.co.uk/world/2007/sep/12/russia.lukeharding, on January 11, 2009. See also "Russia Test's 'World's Most Powerful Bomb,'" Russia Today, September 12, 2007, accessed at http://www.russiatoday.com/news/news/13954, on January 11, 2009; and David Axe, "Did Russia Stage the Father of All Bombs Hoax?" Wired, October 4, 2007, accessed at http://www.wired.com/politics/security/news/2007/10/russian_bomb#, on January 11, 2009.

[52] For a discussion of redefining strategic target sets, see Carl H. Builder, *The Prospects and Implications of Non-nuclear Means for Strategic Conflict*, Adelphi Paper No. 200 (London: International Institute for Strategic Studies, 1985), p. 2.

downlinks, transportation electronic control systems (e.g., traffic lights, aircraft traffic control, railroad switching), power grid controls, computerized gas and oil distribution systems, and electronic banking and commerce now constitute a critical part of the US economy, and thus its strategic target base.[53] Many of these targets can theoretically be disabled by cyber weapons, as well as by guided munitions. Contrast this target set with that of North Korea, a comparatively small, primitive state that can barely lay claim to having entered the industrial age, let alone the information age. Cyber weapons that might prove devastating against the United States' target set may well be ineffective against North Korea.

Geography also plays a role with regard to the target set, either by facilitating or complicating the delivery of nuclear weapons (and other potential "strategic" weapons) on their designated targets. Many attractive targets are located along the long US coastline, which may assist enemies whose nuclear delivery systems are limited to cargo ships or short-range cruise missiles, or who are looking to smuggle a weapon into the country. Having said that, countries such as the United States, China, and especially Russia benefit from their great strategic depth, making certain targets very difficult for all but the most advanced nuclear-armed states to strike either promptly or with high confidence of destruction.

Other countries lack strategic depth. Israel, for example, is exceedingly small when compared to the Cold War superpowers, and is thus highly accessible even for an enemy with modest delivery capabilities. Given its small size and relatively long border, inflicting unacceptable levels of damage on Israel's population and infrastructure would require only a small fraction of the arsenal needed to accomplish a similar level of destruction in America or Russia. It may be within the realm of even a terrorist organization to threaten the existence of Israel, while achieving the same capability against the two giant nuclear powers would be difficult if not impossible. While Israel represents an extreme example, should a nuclear-armed Iran trigger a Middle East nuclear arms race, the relatively small size of the countries involved when compared to the United States and Soviet Union could enable those states (or even nonstate entities) armed with relatively few nuclear weapons to threaten the "assured destruction" of their rivals.

---

[53] For more information on potential information infrastructure targets see *Report of the Defense Science Board Task Force on Information Warfare–Defense*, (Washington, DC: Department of Defense, November 1996); and "Critical Foundations: Protecting America's Infrastructures," *Report of the President's Commission on Critical Infrastructure Protection* (Washington DC: President's Commission on Critical Infrastructure Protection, October 1997). Hereafter the *Report of the President's Commission on Critical Infrastructure Protection* is referred to as the *Marsh Commission Report*. The US policy on critical infrastructure protection is found in Presidential Decision Directive/NSC-63, "Critical Infrastructure Protection," May 22, 1998, accessed at http://www.fas.org/irp/offdocs/pdd/pdd-63.htm, on January 10, 2009. The PDD/63 has been superseded by HSPD-7, "Critical Infrastructure Identification, Prioritization, and Protection," December 17, 2003, accessed at http://www.whitehouse.gov/news/releases/2003/12/20031217-5.html, on January 10, 2009.

Finally, while small countries with relatively small target bases such as Israel or Taiwan may be highly vulnerable to small nuclear powers or nonstate entities, a nonstate group armed with nuclear weapons may actually benefit from having no defined target base at all, and hence no clear assets against which to retaliate.

AMBIGUOUS AGGRESSION MAY INCREASE WHILE DETERRENCE DECLINES

During the Cold War, a nuclear attack on the United States would almost certainly have come from one source: the Soviet Union.

During the period of "nuclear plenty" that dominated the latter years of the Cold War and the First Nuclear Regime, a nuclear attack on the United States would almost certainly have come from one source: the Soviet Union. Two of the other declared nuclear powers, Britain and France, were US allies, and Israel, an undeclared nuclear power, was a close friend of the United States. Only China, with its small arsenal, posed a threat, and then only for a relatively brief period of time.[54] Moreover, the Soviet Union was highly unlikely to expose itself to a massive US nuclear response by attacking with only a small portion of its arsenal (say, with a single weapon in the hold of a cargo ship), while a massive Soviet missile attack would almost certainly have been identified by the United States as such.

In an increasingly proliferated world comprising many nuclear powers, the prospect that the source of a nuclear attack will be increasingly difficult to identify, or identify promptly, seems certain to increase, and perhaps substantially.[55] The issue becomes even thornier if nuclear weapons fall into the hands of nonstate entities.

A half-century ago, in the late 1950s, there was concern in many quarters that the world would see a surge in nuclear proliferation, and that this could produce a catalytic war between the great nuclear powers. Shortly after the 1956 Suez Crisis,[56] in which the Soviet Union threatened both London and Paris with atomic attack, Nevil Shute published his novel, *On the Beach*. The book describes how an Egyptian nuclear attack on Great Britain in the early 1960s is mistakenly seen as a Soviet attack. (The Egyptians use a Soviet-made aircraft.) This triggers a NATO nuclear response on the

---

54 China tested its nuclear weapon in 1964, and slowly developed its nuclear strike capabilities. The PRC did not field its first ICBM until 1981. Center for Defense Information, "China's Nuclear Arsenal," accessed at http://www.cdi.org/issues/nukef&f/database/nukearsenals.cfm, on January 23, 2009. Nine years earlier, in 1972 President Richard Nixon made his famous trip to China, accelerating a steady shift in that country's orientation away from the Soviet Union and toward the United States. Following the Soviet invasion of Afghanistan in December 1979, the Chinese tilt toward the United States was clearly perceptible.

55 For an alternative view regarding the prospective dangers of a proliferated world, see Kenneth Waltz, "The Spread of Nuclear Weapons: More May Better," *Adelphi Papers*, Number 171 (London: International Institute for Strategic Studies, 1981).

56 The Suez Crisis was precipitated by Egypt's decision on July 26, 1956 to nationalize the Suez Canal. This led to an attack on Egypt by Britain, France, and Israel beginning on October 29, 1956. In the face of strong US opposition, the three allies backed down. A cease-fire was declared in early November and the invading forces' troops were withdrawn in December 1956 (Britain and France) and March 1957 (Israel). See Henry Kissinger, *Diplomacy* (New York: Simon & Schuster 1994), pp. 522-49.

Soviet Union which quickly escalates out of control, ultimately involving China as well.[57]

Whether or not one accords plausibility to Shute's account, the prospect of an increasingly proliferated world does raise important questions regarding the prospects for ambiguous forms of aggression, especially when one considers that the United States and Russia are the only two states with sophisticated ballistic missile early warning systems capable of detecting an attack.[58] Nevertheless, even these systems may be put to the test under certain circumstances. Consider, for example, whether these systems could, with a level of confidence sufficient to promptly identify the attacker, positively identify the source of a ballistic missile attack launched against the United States or its vital interests from locations along the Iran-Pakistan border?

Making matters even dicier, neither the United States nor Russia has a comprehensive early warning system to detect a cruise missile attack.

Making matters even dicier, neither the United States nor Russia has a comprehensive early warning system to detect a cruise missile attack. As cruise missile technology proliferates, and as new nuclear-armed states gain access to advanced nuclear weapon design technology, one can expect nuclear-armed cruise missiles to become an attractive alternative to aircraft and ballistic missiles as a delivery system. Indeed, given their slower flight times, from a crisis stability perspective, nuclear-armed cruise missiles might be preferable to ballistic missiles.

However, for several reasons, such nuclear systems might enhance the prospect of successful ambiguous nuclear attack. First, cruise missiles are far more portable than ballistic missiles. Cruise missiles can be moved far more easily, and with far less risk of detection, than ballistic missiles. It is plausible that a cruise missile could be launched from a truck or a cargo ship. The attack could come from any direction, and from a multitude of launch platforms. Cruise missiles are difficult to detect and intercept, as they fly close to the ground and do not need to fly in predictable fixed flight patterns. As cruise missiles follow a very different flight profile from ballistic missiles, early warning systems designed to capture the latter's launch are not of much use against a cruise missile attack. Thus if a nuclear-armed cruise missile is fired, its origins may prove difficult to ascertain.[59]

---

[57] See Nevil Shute, *On the Beach* (New York: Ballentine Books, 1983).

[58] Pavel Povig, "Russia and the Prompt Global Strike Plan," PONARS Policy Memo No. 417, December 2006, accessed at http://www.csis.org/media/csis/pubs/pm_0417.pdf, on January 23, 2009.

[59] The US Army is developing the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS) to assist in detecting cruise missile attacks. Each JLENS would carry a surveillance system involving an elevated long-range surveillance radar, and a fire-control system with an elevated high-performance fire control radar. Both radars would be linked into a large aerostat connected by a tether to the ground-based mobile mooring station and communications processing group. Again, detecting an attack is one thing; intercepting a cruise missile is yet another. Finally, even if an attack is detected, its origins may be difficult to discern, depending upon the standard of proof one seeks to apply. JLENS is in the development phase, and the Army hopes to field in the initial systems in 2012. Martin Sieff, "BMD Watch: JLENS Passes Army PDR," April 2, 2008, accessed at http://www.spacewar.com/reports/BMD_Watch_JLENS_passes_Army_PDR_999.html, on January 23, 2009. It is not clear how many JLENS systems would need to be deployed to provide a comprehensive cruise missile early warning capability for the United States.

It may also prove difficult both to detect and to determine the source of a nuclear attack employing nontraditional delivery means; for example, a nuclear weapon on a freighter. During the period immediately following the Soviet Union's detonation of its first nuclear weapon in August 1949, the possibility that the Soviets might attempt to smuggle a nuclear weapon into the United States was a matter of some concern. J. Robert Oppenheimer, who oversaw the Manhattan Project (under which the first nuclear weapon was built), was asked at a congressional hearing in 1946 "whether three or four men couldn't smuggle units of an [atomic] bomb into New York and blow up the whole city." Oppenheimer responded, "Of course it could be done, and people could destroy New York." When asked how such a weapon smuggled in a crate could be detected, Oppenheimer dryly replied, "With a screwdriver."[60]

Of course, while a smuggled nuclear weapon may have been difficult to detect, the source of the attack would not. During that time the only perpetrator of such an attack would have been the Soviet Union. Today not only would such a weapon still be difficult to detect, but the perpetrator of the attack might also be difficult to ascertain, unless the attacker revealed himself.[61] While progress is being made with respect to nuclear forensics, there is no comprehensive global data bank of reactor materials that would help identify where bomb material originated.[62] Put another way, current nuclear forensics are far more able of telling us where the fissile materials of a nuclear weapon did *not* come from than where they did.

It may be that deterrence, the cornerstone of US nuclear strategy during the First Nuclear Regime, will enable us to avoid such a scenario. France's former foreign minister, Hubert Védrine, has remarked "[T]hat a country that possesses the bomb does not use it and automatically enters the system of deterrence and doesn't take absurd risks."[63] On the other hand, deterrence is based, to a significant extent, on the premise that it is possible to identify the source of an attack, a condition that may be increasingly difficult to meet in an increasingly proliferated world.

Deterrence also assumes an understanding of a rival's sense of costs and benefits, and what he fears. This assumption may not prove out in the case of newly armed nuclear powers. It may be that some of the new nuclear-armed states do not calculate costs and benefits in a manner similar to that of the United States (or, for that matter,

---

[60] Richard L. Garwin, "The Technology of Megaterror," *Council on Foreign Relations*, Technology Review, accessed at http://www.cfr.org/publication/4872/technology_of_megaterror.html, on January 23, 2009.

[61] There is also the possibility, especially in the case of a terrorist attack with nuclear weapons, that multiple actors may claim responsibility (or "credit"). For a discussion of the problems associated with multiple forms of attribution, see Andrew F. Krepinevich, *7 Deadly Scenarios* (New York: Bantam Books, 2009), pp. 63-90.

[62] "Who Did It? Using International Forensics to Detect and Deter Nuclear Terrorism," *Arms Control Today,* October 2006; and Matthew B. Stannard, "New Tools for a New World Order," *San Francisco Chronicle*, October 29, 2006.

[63] Elaine Sciolino, "Chirac's Iran Gaffe Reveals a Strategy: Containment," *New York Times*, February 3, 2007, p. A8.

its Soviet rival during the Cold War). Such states may be far more risk-tolerant than the Kremlin gerontocracy that guided Soviet Russia in its competition with the West. History tells us that some dictators are willing to run risks that seem irrational to others. Adolf Hitler's entire political career was characterized by a willingness to live on the edge, from the Munich putsch to the scrapping of the Versailles Treaty, from the reoccupation of the Rhineland to plunging Germany into a war against the world's two emerging superpowers — the Soviet Union and the United States — within a six-month period. Then there is Josef Stalin, who blockaded Berlin during the period of US nuclear monopoly, and authorized the North Korean invasion of South Korea before the Soviet Union could seriously threaten the United States with a nuclear attack. Despite repeated US attempts to avoid war, and even though nearly the entire world had united against him, Saddam Hussein refused to withdraw Iraqi forces from Kuwait. Yet from their own perspective, these tyrants may have been acting rationally.

In order to deter such rash actions, one needs to know how such men calculate cost, benefit, and risk, as it is clear that they do so in ways quite different from what is characteristic of senior US statesmen. During the Cold War American presidents generally had "only" the Soviet Union's leadership with which to contend. Even then, there was great surprise at Nikita Khrushchev's gamble to emplace nuclear missiles covertly in Cuba in 1962. President John Kennedy's immediate reaction to news of Khrushchev's gambit was to blurt out, "He can't do this to me." Kennedy later remarked that Khrushchev acted like "an immoral gangster…not as a statesman, not as a person with a sense of responsibility." Clearly the president did not understand why Khrushchev would run such a risk. As Michael Dobbs concludes, Khrushchev's calculations of costs, benefits and risk were, in Kennedy's words, "a goddamn mystery." "Why does he put these [missiles] in there [i.e., Cuba]? What is the advantage of that?"[64]

One wonders what President Kennedy would think of men like Mahmoud Ahmadinejad, Saddam Hussein, and Kim Jong-il, let alone Osama bin Laden.

One wonders what President Kennedy would think of men like Mahmoud Ahmadinejad, Saddam Hussein, and Kim Jong-il, let alone Osama bin Laden. What kinds of risks might they be willing to run? How do they view the benefits and risks of undertaking ambiguous nuclear aggression? In short, not only has the deterrence problem multiplied, but the cast of characters makes the old men of the Kremlin seem almost familiar and predictable in comparison to today's gallery of rogues. While newly armed nuclear states may come to embrace US perceptions regarding deterrence, this should not be taken as a given.

For example, not long after becoming president, Ahmadinejad confronted the foreign ministers of Britain, France and Germany, the so-called EU-3, who were attempting to negotiate the termination of Iran's nuclear enrichment program. During the meeting, in September 2005, Ahmadinejad suddenly posed the question: "Do you know why we wish for chaos at any price? Because, after the chaos, we can see the

[64] Michael Dobbs, *One Minute to Midnight,* pp. 6-7, 15.

greatness of Allah."[65] The statement may reflect Ahmadinejad's belief that the Twelfth Imam, or *Mahdi*, who according to Shi'a Muslims will appear to bring Allah's justice over all the Earth, will only emerge following a period of chaos. And what better way to trigger chaos than by employing a nuclear weapon?

The newly armed nuclear states, and those states that seemed poised to follow in their wake, may be driven by other factors as well—domestic instability, historical rivalries, poverty, etc—any of which could make their views on the utility of nuclear weapons significantly, and perhaps markedly, different from those of US policy makers. Just as in the case of Iraq before 2003 and Iran and the DPRK today, our lack of understanding of these countries' internal political dynamics—who controls what, how they calculate cost, benefit and risk, how decisions are made—makes it difficult to state with confidence that they will embrace deterrence as the centerpiece of their nuclear policy.

In short, deterrence could play a much reduced role in a proliferated world, while the prospect of nuclear use, defenses against nuclear attack, war termination strategies, and post-war considerations assume greater importance in defense strategy and planning.

Ahmadinejad suddenly posed the question: "Do you know why we wish for chaos at any price? Because, after the chaos, we can see the greatness of Allah."

A NUCLEAR ARMS MARKET?

The Second Nuclear Regime emerged thanks in no small measure to the existence of a market for nuclear weapons technology. Early in the First Nuclear Regime, technology was acquired, to a great extent, by theft, typically through the efforts of spies, or by willing transfer. The Soviet Union's effort to build a fission weapon and, later, thermonuclear weapons was greatly assisted by the spies it had planted in the US nuclear weapons program. While Moscow shared a considerable amount of its nuclear technology with the Communist regime in China, Beijing also benefitted from intelligence gleaned from the US nuclear weapons program. British and French physicists returning from their work on the Manhattan Project helped lay the foundations of their countries' nuclear weapons programs. France provided key technical support to Israel, to the point where France's first atomic explosion may have been, essentially, a dual-nation test.[66]

---

[65] *Al-Sharq Al-Awsat*, February 4, 2007, cited in Nimrod Raphaeli, "The Middle East on a Collision Course; The Saudi Oil Weapon," Middle East Media Research Institute (MEMRI), February 2, 2007, accessed at http://www.memri.net/bin/articles.cgi?Page=archives&Area=ia&ID=IA32607#_ednref1 on April 25, 2009. The exchange is recalled by former French Foreign Minister Philippe Douste-Blazy, who describes a meeting between the EU-3 foreign ministers together with Javier Solana of the European Union and President of Iran Mahmoud Ahmadinejad. The meeting took place at the United Nations on September 15, 2005, and concerned Iran's nuclear program.

[66] See Thomas C. Reed and Danny B. Stillman, *The Nuclear Express* (Minneapolis, MN: Zenith Press, 2009), Chapters 4-6.

India developed its nuclear weapons, which were first tested in 1974, thanks to President Dwight Eisenhower's "Atoms for Peace" program. India's first weapon used plutonium bred in an "Atoms for Peace" CIRUS reactor offered as a gift by Canada.[67] During this time there emerged the most notorious market to date in nuclear technology. At its head was Abdul Qadeer (A.Q.) Khan, generally known as the father of Pakistan's nuclear weapons program. Khan not only assembled the technology and materials necessary to make Pakistan a nuclear power, he opened what essentially was a "Wal-Mart of private sector proliferation" involving some of the world's most notorious regimes, including those in Iran, Libya, and North Korea.[68] These efforts received significant support, directly or indirectly, from China.[69]

Although Khan's nuclear arms market was eventually uncovered, the damage is done. Not only did Pakistan, one of the world's most unstable large countries, acquire nuclear weapons, but it is likely that substantial assistance provided by Khan has assisted both the North Korean and the Iranian nuclear weapons programs.

While it appears that neither weapons-grade fissile material nor nuclear weapons themselves have been transferred from one country to another, there are concerns that such a direct market for nuclear weapons could be established, especially given the character of the North Korean regime and Iran's apparent drive to become a nuclear-capable (if not nuclear-armed) state. In the case of North Korea, the regime of Kim Jong-il has actively participated in a range of illegal activities, to include drug smuggling, counterfeiting and money laundering. The US intelligence community has presented evidence that strongly suggests Pyongyang was actively assisting Syria in its efforts to build a nuclear reactor.[70]

Potentially of even greater concern is the prospect that Saudi Arabia may seek nuclear weapons should Iran become a nuclear power. Rather than go through the difficult and time-consuming process of building its own nuclear weapon, Saudi Arabia may be more inclined to purchase them, perhaps from Pakistan, to whom the Saudis have provided substantial economic assistance over the years. A more modest alternative could find Pakistani troops stationed on Saudi soil and armed with nuclear

---

[67] The Atoms for Peace initiative involved the transfer of nuclear technology and equipment for peaceful uses. Reed and Stillman, *The Nuclear Express*, p. 57.

[68] The quote is form Mohamed El Baradei; Mark Landler and David E. Sanger, "Pakistan Chief Says It Appears Scientists Sold Nuclear Data," *New York Times,* January 24, 2004. Cited in Graham T. Allision, *Nuclear Terrorism: The Ultimate Preventable Catastrophe* (New York: Owl Books, 2005), pp. 151, 162; and

[69] Reed and Stillman, *The Nuclear Express*, pp. 247-49, 252-53. China transferred nuclear technology to Pakistan, provided the Pakistanis with a nuclear weapon design, and may have tested a Pakistani fission weapon at its Lop Nur facility in May 1990.

[70] Greg Miller and Paul Richter, "U.S. Offers Evidence of North Korea-Syria Nuclear Plant," *Los Angeles Times*, April 25, 2008.

weapons that would remain under Pakistani control—at least nominally.[71] Given their country's central role as an exporter of oil to the global economy, should the Saudis choose to purchase a nuclear arsenal it may be difficult for the United States, or other countries, to impose economic sanctions against it, let alone attempt to reverse the act through the use of force. Should such a situation obtain, it could pave the way for an open, and greatly expanded, nuclear arms market, to include the transfer of nuclear weapons themselves. This could dramatically accelerate the rate of nuclear proliferation, especially in the Middle East, where Iran's move toward acquiring the ability to make nuclear weapons has led a number of states to declare their intent to pursue the "peaceful" development of nuclear energy—just as India, North Korea and Pakistan had declared prior to developing their weapons programs.[72]

---

[71] Pakistan reportedly stationed ground forces in Saudi Arabia from roughly 1979 to 1987 to assist the royal family maintain internal security in the wake of the Shah's fall, the Soviet invasion of Afghanistan, and the assault on the Great Mosque in Mecca. Thomas W. Lippman, "Nuclear Weapons and Saudi Strategy," Saudi-US Information Service, February 9, 2008, accessed at http://www.saudi-us-relations.org/articles/2008/ioi/080209-lippman-nuclear.html, on January 25, 2009. Some have alleged that a secret agreement exists between Pakistan and Saudi Arabia for the transfer of nuclear weapons, should the Saudis decide it has become necessary. See Arnaud de Borchgrave, "Pakistan, Saudi Arabia in Secret Nuclear Pact," *The Washington Times*, October 22, 2003, accessed at http://www.globalsecurity.org/org/news/2003/031022-pakistan_saudi-arabia.htm, on January 25, 2009.

[72] The Middle Eastern states declaring an interest in developing commercial nuclear power include Algeria, Egypt, Morocco, Saudi Arabia, Tunisia and the United Arab Emirates. Richard Beeston, "Six Arab States Join Rush to Go Nuclear," *The London Times*, November 4, 2006, accessed at http://www.timesonline.co.uk/tol/news/world/middle_east/article624855.ece, on January 25, 2009. According to some experts, the move coincided with declining confidence in the West's efforts to restrain Iran's nuclear weapons development, and the corresponding rise of a desire to develop a hedge against a nuclear-armed Iran.

CHAPTER 3 > **THE LOGIC OF ZERO?**

As the trend toward nuclear proliferation grows, are we left to hope that a multitude of nuclear-armed states will enhance stability and reduce conflict, creating a world of many "scorpions in a bottle?"[73] To many, that is a dark future in which survival rests on nothing more than a forlorn hope, especially when some of the scorpions may be radical nonstate groups with millenarian goals that can best be advanced through the kind of apocalyptic events that nuclear weapons use can help bring about. Rather than accept a proliferated world, they argue that a world without nuclear weapons is not only desirable, but possible. The Obama Administration has committed itself to the pursuit of this goal, embracing two overriding objectives: maintaining an effective nuclear arsenal while limiting — and ultimately reducing — the number of nuclear weapons to the point of elimination. Are these objectives compatible? Is a world without nuclear weapons a realistic goal? If it is, would such a world represent an improvement over a world in which nuclear weapons existed? This chapter is devoted to providing a first cut at addressing these issues.

While "ban the bomb" movements are almost as old as nuclear weapons themselves, the current movement toward eliminating all nuclear weapons has attracted support across the political spectrum. By far the most influential presentation of this

---

[73] There are some experts who argue that nuclear proliferation, depending upon the circumstances, can be a force for stability. See John J. Mearsheimer, "The Case for a Ukrainian Nuclear Deterrent," *Foreign Affairs*, Summer 1993. Mearsheimer has argued not only in favor of a Ukrainian nuclear capability, but also in support of a German nuclear force, and has argued that India's nuclear capability was necessary to effect a stable military balance against China and Pakistan. John J. Mearsheimer, "India Needs the Bomb," *New York Times*, March 24, 2000, p. A21. The phrase "scorpions in a bottle" was coined by J. Robert Oppenheimer in a 1953 article written for *Foreign Affairs*. With regard to the growing Soviet nuclear capability, Oppenheimer observed: "We may anticipate a state of affairs in which two Great Powers will each be in a position to put an end to the civilization and life of the other, though not without risking its own. We may be likened to two scorpions in a bottle, each capable of killing the other, but only at the risk of his own destruction." *Dark Sun: The Making of the Hydrogen Bomb*, p. 567.

view has been advanced by Henry Kissinger, Sam Nunn, William Perry and George Shultz, highly regarded senior statesmen from both political parties.

The "Four Horsemen of the Apocalypse," as they have been called, argue that the world is at a "nuclear tipping point" in which "nuclear weapons [are] more widely available, [and] deterrence decreasingly effective and increasingly hazardous." The result is that "the world is now on the precipice of a new and dangerous nuclear era. Most alarmingly, the likelihood that non-state terrorists will get their hands on nuclear weaponry is increasing."[74] This stems from fears that the instability that plagues several existing and prospective nuclear states could lead to the collapse or overthrow of their governments. Should that occur, the security of their nuclear weapons could be jeopardized, and the likelihood of a nuclear weapon or fissile material finding its way into the hands of terrorist groups would increase substantially. Moreover, it is not inconceivable that, in the event of a more proliferated world, radical nuclear-armed states might transfer nuclear arms or fissile material to radical nonstate entities.

Whether the result of cultural differences, intense and ongoing rivalries with their neighbors, internal divisions, or other factors, there are doubts as to whether regimes such as those in Iran, North Korea, and Pakistan would be as reluctant to resort to nuclear use as the "mature" nuclear-armed states of the First Nuclear Regime.

Preventing nuclear terrorism is only one of the problems the United States will confront in an increasingly proliferated world. Aside from the growing risk of nuclear weapons falling into the hands of nonstate entities, an increase in the number of nuclear-armed states—especially states in the developing world—poses other significant security problems. First, it is not clear that these states would view nuclear weapons in the same way that the political leadership of the United States and other major powers have come to view them—as weapons of last resort. Whether the result of cultural differences, intense and ongoing rivalries with their neighbors, internal divisions, or other factors, there are doubts as to whether regimes such as those in Iran, North Korea, and Pakistan would be as reluctant to resort to nuclear use as the "mature" nuclear-armed states of the First Nuclear Regime—the United States, Russia, Great Britain, France and China—have proven to be. Second, the acquisition of nuclear weapons by hostile regimes threatens to disrupt the existing military balance by significantly restricting the United States' options for projecting power in the event of a crisis. Third, nuclear proliferation may embolden hostile regimes to engage in ambiguous forms of aggression, such as support for terrorist and insurgent groups. For example, during the 1990s, Pakistan's government supported Kashmiri insurgents in an effort to draw India into a costly and potentially exhausting counterinsurgency war. Pakistan's decision to support the insurgents was bolstered by its nuclear capability, which made it unlikely that India would respond by undertaking a large-scale

---

[74] Shultz et al., "A World Free of Nuclear Weapons,"; and George P. Shultz, William J. Perry, Henry A. Kissinger and Sam Nunn, "Toward a Nuclear-Free World," *The Wall Street Journal*, January 15, 2008. For a discussion of the dangers associated with nuclear terrorism, see Graham T. Allison, *Nuclear Terrorism* (New York: Owl Books, 2004); and Krepinevich, *7 Deadly Scenarios*, pp. 63-90; and 238-241. See also Montgomery, *Nuclear Terrorism: Assessing the Threat, Developing a Response.*

conventional military operation against Pakistan.[75] Finally, there is the prospect that proliferation will stimulate further proliferation. The acquisition of nuclear weapons by one state could set off a nuclear "chain reaction," as regional rivals seek a nuclear arsenal of their own to match their newly armed nuclear neighbor. Iran's pursuit of a nuclear weapons capability clearly has the potential to generate such an effect.[76]

Given these circumstances, it is easy to understand why the "logic of zero" nuclear weapons, as some refer to it, is so compelling. The fact that such sober-minded statesmen as the Four Horsemen have advanced the case only enhances its appeal.

The acquisition of nuclear weapons by one state could set off a nuclear "chain reaction," as regional rivals seek a nuclear arsenal of their own to match their newly armed nuclear neighbor.

THE ZERO OPTION

To be sure, given the potential consequences of an increasingly proliferated world, establishing a strong global counterproliferation regime, and limiting, if not rolling back, the number of nuclear-armed states will undoubtedly be one of the most pressing and enduring US national security challenges of the twenty-first century. But this is not the same as setting a goal of eliminating all nuclear weapons.

Is it possible to fashion a world without nuclear weapons? The "Four Horsemen" and others who advocate placing the abolition of nuclear weapons at the center of US national security policy believe it is. The Four Horsemen cite the Nuclear Nonproliferation Treaty (NPT), Cooperative Threat Reduction program, Global Threat Reduction Initiative and Proliferation Security Initiative as efforts already under way to limit the spread of nuclear weapons. To build upon this foundation and generate momentum for what they admit will almost certainly be a long road toward abolishing nuclear weapons, the four statesmen advocate the following initiatives:[77]

UNILATERAL US INITIATIVE

> Initiating a bipartisan process within the United States Senate to ratify the Comprehensive Test Ban Treaty (CTBT). This can be achieved if recent technical advances for assuring the reliability of the US nuclear arsenal are taken into account. The United States should also work to secure CTBT ratification by other key states.

BILATERAL US-RUSSIAN INITIATIVES

> Eliminating short-range nuclear weapons.

---

[75] Guarav Kampani, "Placing the Indo-Pakistani Standoff in Perspective," Center for Nonproliferation Studies, Monterey Institute of International Studies, n.d., p. 4, accessed at http://cns.miis.edu/pubs/reports/pdfs/indopak.pdf on July 11, 2008.

[76] William J. Broad and David E. Sanger, "With an Eye on Iran, Rivals Also Want Nuclear Power," *New York Times,* April 15, 2007; and Joby Warrick, "Spread of Nuclear Capability is Feared," *Washington Post*, May 12, 2008, p. A1.

[77] These recommendations are drawn from Shultz et al., "A World Free of Nuclear Weapons"; and Shultz et al., "Toward a Nuclear-Free World."

- Extending key provisions of the 1991 Strategic Arms Reduction Treaty (START), currently scheduled to expire on December 5, 2009. The Four Horsemen argue that the treaty's key essential monitoring and verification provisions should be extended, and the additional nuclear arms reductions called for in the 2002 Moscow Treaty on Strategic Offensive Reductions completed as soon as possible.[78]
- Increasing the warning and decision times for the launch of all nuclear-armed ballistic missiles, thereby reducing the risk of accidental or unauthorized attacks. Moreover, the Four Horsemen assert that developments in cyber-warfare pose new threats to nuclear command and control systems that could produce disastrous consequences.
- Discarding Cold War-era operational plans for massive attacks.

MULTILATERAL INITIATIVES

- Initiating negotiations toward developing cooperative multilateral ballistic-missile defense and early warning systems.

NUCLEAR WEAPONS MATERIALS

- Dramatically increasing efforts to insure the highest possible security standards for all stocks of weapons, weapons-usable plutonium, and highly enriched uranium.
- Regulating the uranium enrichment process by limiting the states engaged in it, combined with the guarantee that uranium for nuclear power reactors could be obtained at a reasonable price, first from the Nuclear Suppliers Group and then from the International Atomic Energy Agency (IAEA) or other controlled international reserves.
- Halting the production of fissile material for weapons globally, while phasing out the use of highly enriched uranium in civil commerce and removing weapons-usable uranium from research facilities around the world and rendering the materials safe.

GENERAL EFFORTS

- Redoubling efforts to resolve regional confrontations and conflicts that give rise to new nuclear powers.

---

[78] The Moscow Treaty, also known as the Strategic Offensive Reduction Talks (SORT), was negotiated between the United States and Russia and signed in Moscow in May 2002. Each party agreed to limit its nuclear arsenal to 1,700–2,200 operationally deployed warheads. The treaty expires on December 31, 2012.

NUCLEAR FORCES

> Continuing to reduce substantially the size of nuclear forces in all states that possess them.

Some experts in the field of nuclear arms control have expanded upon the Four Horsemen's initial recommendations for action. Ivo Daalder and Jan Lodal advance four major steps that they believe will advance the nuclear abolitionists' aims.

> The United States must abandon its policy of ambiguity when it comes to nuclear weapons. A series of administrations, Democrat and Republican, have refused to state precisely under what conditions the United States would employ nuclear weapons. Daalder and Lodal believe the United States should declare the United States will only employ nuclear weapons in the event they are used by others.

> Daalder and Lodal believe this policy will enable the United States to reduce its nuclear arsenal from the 1,700-2,200 weapons agreed to in the Moscow Treaty of 2002 to no more than one thousand weapons. "This would be more than enough

TABLE 1. **STRATEGIC ARMS CONTROL AGREEMENTS**

	Strategic Arms Reduction Treaty (START)	**Strategic Offensive Reductions Treaty (SORT)**
Date Signed	July 31, 1991	May 24, 2002
Date Entered into Force	December 5, 1994	June 1, 2003
Expiration Date	December 5, 2009	December 12, 2012
Key Provisions	> Each side is limited to 1,600 delivery vehicles—ICBMs, SLBMs, and heavy bombers > Each side can deploy no more than 6,000 "accountable" nuclear warheads (with the exact number dependant on treaty-specified counting rules) > No more than 4,900 warheads can be deployed on ICBMs and SLBMs > No more than 1,540 warheads can be deployed on "heavy" ICBMs (e.g., the Soviet SS-18) > No more than 1,100 warheads on mobile ICBMs > Total ballistic missile throw-weight is limited to 3,600 metric tons for each party	> Each side will reduce their strategic nuclear arsenals to between 1,700 and 2,200 warheads by the treaty expiration date > The types of warheads to be reduced and their ultimate disposition is not specified
Verification Measures	On-site inspections and information exchanges	None

Sources: Arms Control Association Factsheets: "The Strategic Offensive Reduction Treaty (SORT) at a Glance," September 2006; "START I at a Glance," January 2009; and "U.S.-Soviet/Russian Nuclear Arms Control Agreements at a Glance," February 2009, accessed at http://www.armscontrol.org/factsheets on February 22, 2009.

to convince anyone that the United States possesses the capacity to respond to any use of nuclear weapons with devastating effect."[79]

- The authors support the Four Horsemen's conclusion that the road to nuclear weapons abolition must find the United States working to "put in place a comprehensive international nuclear-control regime that goes well beyond the present nonproliferation regime's accounting and monitoring of nuclear materials." This new control regime "must include all fissile materials and provide an airtight verification system to enable the world to move from thousands of nuclear weapons to hundreds, to tens, and ultimately to zero."[80]
- Daalder and Lodal call for the United States to "launch a vigorous diplomatic effort to convince the world of the logic of zero — and of the benefits of taking the difficult steps necessary to get there." The effort would initially be focused on America's "closest and most important allies," expand to encompass nonnuclear states who support nuclear abolition, and ultimately engage the nuclear-armed states. The United States' credibility in advancing this agenda will be tied to its willingness to reduce its reliance on nuclear weapons and make drastic reductions in its nuclear arsenal.[81]

IS THE ZERO OPTION POSSIBLE?

The Four Horsemen do not give short shrift to the formidable barriers that exist to the realization of their goal. Thus they advocate a step-by-step approach, moving slowly but hopefully inexorably along the long path to a world free of nuclear weapons. Yet support for making the abolition of nuclear weapons a central element of US security policy is far from unanimous. Some hold serious doubts regarding the feasibility of even a phased approach toward nuclear abolition. Others question the benefits of a nuclear-free world. For example, former defense secretary Harold Brown and former CIA director John Deutch, both Democrats, believe "the goal, even the aspirational goal, of eliminating all nuclear weapons is counterproductive."[82] Why is this so? The remainder of this chapter is devoted to the possibility, and the desirability, of achieving nuclear disarmament.

---

[79] Ivo Daalder and Jan Lodal, "The Logic of Zero: Toward a World Without Nuclear Weapons," *Foreign Affairs*, November/December 2008, accessed at http://www.foreignaffairs.org/20081001faessay87606/ivo-daalder-jan-lodal/the-logic-of-zero.html, on February 13, 2009.

[80] Ibid.

[81] Ibid. George Perkovich and James Acton have offered a detailed approach for accomplishing the abolition of nuclear weapons, to include the characteristics of a post-nuclear regime. In this respect, they go far beyond the initial steps suggested both by the Four Horsemen, and those presented by Daalder and Lodal. See George Perkovich and James M. Acton, *Abolishing Nuclear Weapons* (London: International Institute of Strategic Studies, 2008).

[82] George Perkovich, "Abolishing Nuclear Weapons: Why the United States Should Lead," Carnegie Endowment for International Peace, October 2008, p. 1.

Foregoing "The Great Equalizer"

Confronted with these concerns, nuclear abolitionists assert that the goal is not to "uninvent" nuclear weapons, but rather to implement the means to monitor and verify disarmament with a high degree of confidence (to eliminate the possibility of cheating), and to guarantee that cheaters, once identified, will be promptly and severely punished before they can gain a significant advantage. But this begs several questions. First, how can every nuclear-armed state be convinced to abandon its ultimate deterrent in exchange for promises that an external control regime will prove a superior alternative? Moreover, as nuclear weapons have been widely viewed as the "great equalizer" in offsetting an enemy's advantages in other areas of the military competition, why would any state that is at a severe disadvantage in this competition risk its security by foreswearing acquiring nuclear weapons, let alone handing them over to an international control regime? Such an action would violate one of the fundamental responsibilities of any sovereign government: to ensure the survival and well-being of its citizens. The historical track record reflects this: the few attempts to ban such "equalizer" weapons have not been successful. [83]

Simply stated, nuclear weapons confer a strong security guarantee. Inducing states either to forego their acquisition or to give them up requires providing states with an alternative guarantee of equal or greater value than the guarantee provided by a nuclear arsenal. This is especially true in the case of states with inferior conventional militaries. Those advocating a shift to a world without nuclear weapons would have to address two key questions: where would such a guarantee come from, and why would it be credible?

Those advocating a shift to a world without nuclear weapons would have to address two key questions: where would such a guarantee come from, and why would it be credible?

The Key Enabler: A Global Government?

It may be that the only practical way to bring about global nuclear disarmament and realize the benefits in terms of reduced military expenditures and enhanced prospects for world peace is to establish some form of global government or global hegemonic power. A global government would have no incentive to seek nuclear weapons, as all coercive power would reside in it. There would be no incentive to cheat, as there would be no rival against whom to cheat.

However, establishing a global government seems unlikely, especially under the current circumstances. Recent attempts to form a world body have either resulted in failure, as with the League of Nations, or general disappointment, as in the case of the United Nations. Indeed, during the life of these international bodies it has been one

---

[83] Banning even simple "equalizer" weapons has proven impossible. For example, during the Middle Ages a knight was considered to be the pre-eminent military system, worth a significant multiple of basic infantrymen. Both the long bow and the crossbow changed this calculus dramatically. Although the Magna Carta (1215) sought to ban foreign crossbowmen from England, and the Catholic Church had tried to ban the weapon as well, these bans were simply ignored, and the crossbow remained a favored weapon across both Europe and England. Bernard and Fawn M. Brodie, *From Crossbow to H-Bomb* (Bloomington, IN: Indiana University Press, 1973), pp. 35-39.

country—the United States—and not international institutions that has stood as the world's principal source of stability. The United States decisively tipped the scales in favor of the Allies in World War II (and likely World War I as well), kept the malignancy of Communism at bay during the Cold War, and is the principal force for global stability in the modern era, as evidenced by the absence of any serious effort by the rest of the world to form a counterbalancing alliance against it. Yet the United States has neither the resources nor the stomach to attempt a bid at global hegemony. Nor is any other country poised to take on the role of benign global hegemon.

Further, it is not clear that, assuming one could be created, a global government would reflect the liberal, democratic values that many nuclear abolitionists hold dear. If a global government were to reflect the world as it exists today, it may not be at all to the United States' liking. Democracy is receding in places where it had taken root, as in Russia and parts of Latin America. Many "democratic" governments in the developing world are rife with corruption, and hardly democratic by US standards.

If a global government were to reflect the world as it exists today, it may not be at all to the United States' liking.

Moreover, given the disparity between population growth in the developing world and the dramatic declines underway in the populations of the great democracies of Japan and Western Europe, a global government may not necessarily be democratic or reflective of Western Civilization values. This raises doubts over whether a global government would represent even a poor substitute, let alone an improvement, over the form of government Americans have developed over the past 234 years.

If a global government is the most practical way of ensuring the integrity of a nuclear-free world, it may be neither achievable in a form that the United States would accept, nor desirable in the form in might assume. In short, those arguing for the practicality of creating a global government that is widely accepted as legitimate and which has the power to enforce its writ over any country or group that might oppose it have a very high barrier of historical evidence and contemporary concerns to surmount.

"Uninvention"

The world cannot simply "uninvent" nuclear weapons. No weapon developed thus far in the course of human history has been successfully banned. The chemical weapons convention has not prevented states from creating chemical weapons, or from creating them at some future point in time if need be. The same can be said of biological weapons.

Some argue that this is beside the point. They note that "civilization has nevertheless prohibited and dismantled artifacts deemed too dangerous, damaging, or morally objectionable to deal with."[84] They cite Nazi Germany's gas chambers as an example. Yet decades after these gas chambers were put out of commission, Iraq used poison gas both against Iran during the Iran-Iraq War and against its own citizens, killing

[84] Perkovich, "Abolishing Nuclear Weapons: Why the United States Should Lead," p. 3.

tens of thousands of people. Simply stated, the world has yet to ban successfully any weapon deemed to be effective by those with the desire and the means to acquire it.

"Spillover"

Moreover, steps to eliminate nuclear weapons will likely have spillover effects in the form of efforts to limit other weapons. For example, at some point negotiations over nuclear arms reductions might need to account for precision-guided weapons as well, given their devastating impact in recent conflicts.[85] This raises the specter of a greatly expanded abolition agenda beyond nuclear weapons themselves, to include guided weapons, directed energy weapons, and non-nuclear weapons of mass destruction (i.e., chemical and biological weapons). At what point does this cascading effect stop? Would states be willing to abandon these kinds of weapons as well? If so, how would their compliance be assured? Enforced? As a practical matter, such an agenda can be viewed as one in which those states with an advantage in technology—the United States and its key allies (i.e., Australia, Japan and NATO), the major forces for stability in the world—are obliged to give up a major source of their military advantage and, by extension, their security. This raises the question of whether the world would encounter periods of great instability on the road to nuclear weapons abolition.

What means will be available to ensure that cheating will be promptly and unambiguously detected?

Detection and Enforcement

The Four Horsemen express deep concern over the limitations of existing methods of detecting cheating and enforcement actions against those who cheat. Their concerns are well-founded. Persuading nuclear-armed states to dismantle their nuclear arsenals will, at a minimum, require iron-clad guarantees that cheaters will be, without exception, promptly detected and punished before they can gain a significant military advantage, *pour encourager les autres*.[86] What means will be available to ensure that cheating will be promptly and unambiguously detected? The First Gulf War revealed

---

[85] The Chinese have taken the position that "it is necessary to prevent a small number of countries, by taking advantage of their advanced military technology and economic power, from seeking their 'absolute' security and military superiority over others and concentrating the target of disarmament at the developing countries and depriving their legitimate right and means of self-defense…." Sha Zukang, Ambassador for Disarmament Affairs of the People's Republic of China, Statement at the First Committee of the 52nd Session of the United Nations General Assembly, New York, October 14, 1997.

[86] "Pour encourager les autres" is a quote from Voltaire's *Candide*. The full quote is "dans ce pays-ci, il est bon de tuer de temps en temps un amiral pour encourager les autres" ("in this country {i.e., England], it is good, from time to time, to kill an admiral, to encourage the others"), and refers indirectly to the execution of Admiral John Byng, who was executed at the outbreak of the Seven Years' War. Byng was sent to relieve the island of Minorca from French assault. At that time Minorca was seen by some as being as valuable as Gibraltar. Byng's attack on the French fleet was deemed half-hearted. Byng withdrew to Gibraltar, Minorca fell, and the British Admiralty court-martialed Byng. The court found that he "did not do his utmost to take, seize, and destroy the ships of the French king, which it was his duty to have engaged." He was convicted of negligence. His execution sent a message to other admirals (*pour encourager les autres*) regarding the need to maintain an aggressive fighting spirit. Ashley Pomeroy, "Pour Encourager Les Autres," accessed at http://everything2.com/index.pl?node_id=1469618 on April 3, 2009.

that Iraq's nuclear weapons program was much further along than believed at the time.[87] Iran claims that it is developing its nuclear energy capability. Yet this conflicts with suspicions by other states that it is moving along the path to nuclear weapons development.

To date the existing detection regime has not met this standard, either in uncovering a clandestine nuclear weapon program in a state that has not signed the NPT (e.g., South Africa)[88] or providing unambiguous evidence that an NPT signatory state is violating its obligations under the treaty to foreswear a nuclear arms capability. Indeed, each of the three states cited above was a signatory to the NPT and subject to inspections by the International Atomic Energy Agency during the period while these violations — real or apparent — were occurring.

Cheating — *and getting away with it* — is nothing new when it comes to major arms control agreements.

Cheating — *and getting away with it* — is nothing new when it comes to major arms control agreements.[89] For example, the Americans and Japanese skirted the terms of the 1930 London Naval Treaty by building "light" cruisers that were effectively heavy cruisers.[90] German violations of the Versailles Treaty were egregious after Adolf Hitler's rise to power in 1933. For example, the British government reacted to Germany's overt violations of the treaty by concluding the 1935 Anglo-German Naval Agreement (AGNA). During negotiations the Germans informed the British that two "pocket battleships" being built were, in fact, battle cruisers. This was a major violation of the Versailles Treaty's established limits.[91] Although Great Britain possessed an overwhelming advantage in naval power, and with her ally France a decisive advantage in land power as well, the violation did not produce enforcement, but rather yet another arms treaty that accepted Germany's violations of the previous treaty. The ink on the AGNA was no sooner dry than, in 1936, the Germans began construction of the battleship *Bismarck*. Although technical data provided by the Germans purported to show that *Bismarck* and her sister-ship *Tirpitz* were within treaty limits,

---

87 Paul Kerr, "Bush's Claims about Iraq's Nuclear Program," *Arms Control Today*, September 2003.

88 South Africa signed the NPT only after it had developed nuclear weapons. To date, it is the only state that both indigenously developed nuclear weapons and voluntarily dismantled its nuclear arsenal.

89 See Robin Ranger, "A Positive Compliance Regime for the INF Treaty," Heritage Lecture #140, December 14, 1987, accessed at http://www.heritage.org/Research/NationalSecurity/HL140.cfm on April 1, 2009.

90 Joseph A. Maiolo, "Anglo-Soviet Naval Armaments Diplomacy Before the Second World War," *English Historical Review,* April 2008, p. 6.

91 Germany violated the 10,000 ton displacement cap in Versailles by 17 percent. Barton Whaley, "Covert Rearmament in Germany, 1919-1939: Deception and Misperception," in John Gooch and Amos Perlmutter, eds., *Military Deception and Strategic Surprise* (London: Frank Cass, 1982), p. 33.

the two battleships each violated the agreement's limits by roughly 20 percent (41,700 tons vice the treaty's 35,000 ton limit).[92]

More recently, the Soviet Union violated the 1972 ABM Treaty by constructing a radar prohibited by the treaty at Krasnoyarsk.[93] The Soviet Union also violated the Biological Weapons Convention from the day it signed the treaty in 1972. The illegal program was finally revealed, not by any inspection regime, but by scientists formerly involved in the program, and was finally confirmed by Boris Yeltsen, Russia's first post-Soviet president.[94]

Finally, what states, having given up nuclear weapons, will be anxious to take on a state that, having cheated, is now armed with nuclear weapons? Take the above examples. Three minor powers were determined to have violated the terms of an agreement that restricted their development of nuclear weapons. They confront an international community whose leading powers not only possess nuclear weapons, but overwhelming superiority in every other dimension of military power. Yet there has been no move to punish them promptly or severely. Indeed, North Korea went on to test a nuclear weapon, and Iran is reported to have enough low enriched uranium for a single nuclear bomb, if that uranium is further enriched into weapons-grade material.[95] In the case where prompt and severe action was taken (albeit mistakenly) by the United States and its allies against Iraq in 2003, the international community generally opposed it. In short, there appears to be little basis for states to assume that both swift detection and prompt retribution will be a reliable component of any nuclear disarmament regime.

What states, having given up nuclear weapons, will be anxious to take on a state that, having cheated, is now armed with nuclear weapons?

Consider a simple thought experiment. If the world proposed by nuclear abolitionists existed today, and both China and Russia were discovered to be pursuing clandestine nuclear weapons programs, what countries would be willing to go to war to stop them? And what would the costs of such a war entail? Suppose China and Russia had a stockpile of biological weapons in addition to their traditional military capabilities? What if it was unclear whether or not they had succeeded in building even a dozen thermonuclear weapons? What states would answer the call to enforce the

---

92 The Germans lied about the displacement of *Bismarck* and *Tirpitz*—they said each ship would displace no more than 35,000 tons, the cap established by the Washington Treaty in 1922, but each ship's actual displacement was 41,700. Ibid., p. 34. Technically, however, the warships may have ended up within the treaty limits. The 1936 London Treaty had an escalator clause that allowed for heavier armaments and displacement up to 45,000 tons if Italy and Japan didn't sign by the following year. They did not. William H. Gartzke, Robert O. Dulin, and Alan Raven, *Battleships: Axis and Neutral Battleships in World War II* (Annapolis: Naval Institute Press, 1985), p. 203.

93 "Yeniseysk (Krasnoyarsk)," accessed at http://www.globalsecurity.org/wmd/world/russia/yeniseysk.htm on April 16, 2009.

94 Amy E. Smithson, "Biological Weapons: Can Fear Overwhelm Inaction," *The Washington Quarterly, Winter* 2004-05, pp. 168-169; and Federation of American Scientists, "Chemical and Biological Weapons Chronology," accessed at http://www.fas.org/nuke/control/bwc/chron.htm, on April 16, 2009.

95 William J. Broad and David E. Sanger, "Iran Has More Enriched Uranium Than Thought," *New York Times*, February 19, 2009.

ban on such weapons? What would be the cost if an attempt were made to disarm the violators?

The situation calls to mind the motion picture *High Noon*. In it, a nineteenth century small western American town confronts a band of killer gunmen. While the townspeople greatly outnumber the killers, none offer to help the town sheriff, who must confront them alone. Faced with the prospect of endangering themselves by confronting the killers or hoping someone else will take the responsibility, the townspeople act as "free riders" hoping that the sheriff will prevail. Implicit is the townspeople's willingness to live under the shadow of the killer gunmen if the sheriff, confronting long odds, fails to prevail. In other words: If the international community is unwilling to confront decisively the relatively weak violators of the NPT today, what can be inferred about their willingness to confront the "killer gunmen" violators of the peace tomorrow?

The Increased Incentive to Cheat

The incentive to cheat may also be greater in a nuclear-free world. Ongoing violations of the NPT may, at most, result in a country like Iran or North Korea getting a handful of nuclear weapons before their violations are unambiguously confirmed. This (as will be discussed presently) is most unfortunate, but when compared to some two thousand nuclear weapons in the US arsenal, the cheating countries' nuclear weapons would not radically alter the nuclear balance.

In a nuclear-free world, however, even a handful of nuclear weapons offer enormous advantages to the one state that can acquire them, or at least the weapons can be perceived as offering great advantage. As the saying goes, we have been to this movie before. During the brief period of US nuclear monopoly, Josef Stalin, the Soviet Union's dictator, instructed his chief nuclear weapons program scientist, Igor Kurchitov, to

> Provide us with atomic weapons in the shortest possible time.... The [military] balance has been destroyed. Provide the bomb—it will remove a great danger from us.[96]

It would seem the United States agreed. During the period following World War II American conventional forces were reduced to such low levels that even a minor contingency—the Korean War—found the United States woefully unprepared to deal with the conventional forces of a minor military power. George C. Marshall, the Army's chief of staff during World War II and secretary of state in the late 1940s, recalled that

> I was being pressed constantly, particularly when I was in Moscow... to give the Russians hell.... At that time, my facilities for giving them hell–and I am a soldier and know something about the ability to give hell—was one and a third divisions over the entire United

[96] Newhouse, *War and Peace in the Nuclear Age*, p. 53

States. That is quite a proposition when you deal with somebody with over 260 [divisions] and you have one and a third.[97]

President Truman, however, seemed to believe that, since two atomic bombs had "ended" World War II, the US atomic monopoly evened things out. His faith in the power of the United State's handful of fission bombs led him to suggest that the great seal of the United States be adapted so that the arrows grasped in the eagle's claws would have lightning bolts emanating from them as a "symbolic reference to the tremendous importance of the atomic bomb."[98]

Cheating also seems to favor totalitarian or authoritarian regimes relative to democracies. This may be due in part to the fact that democracies are characterized by internal government "whistle-blowers," an independent press that acts as a watchdog on government activities, and a legislative branch in which the minority party (or parties) provides oversight on the party in power. Dictatorships do not suffer from such "handicaps" and are able to violate their treaty obligations with significantly greater ease.

Cheating also seems to favor totalitarian or authoritarian regimes relative to democracies.

In summary, cheating in a nuclear-free world is likely to offer greater potential advantages to successful cheaters. Moreover, the states likely to be the most successful at cheating are those who are most likely to be hostile to the interests of free peoples and democratic institutions.

Redirection

The history of arms control has also been one in which military competition is deflected or redirected, rather than resolved. Thus the Washington Naval Treaty led the major powers to place relatively greater emphasis on aircraft carriers, given the tonnage limits placed on battleships, and to increase focus on qualitative improvements. The Strategic Arms Limitation Talks (SALT) I Treaty, which limited nuclear weapons delivery systems (but not the weapons themselves), incentivized the United States and Soviet Union to arm their missiles with multiple nuclear warheads.[99]

Given these precedents, the abolition of nuclear weapons could easily find states in hot pursuit of biological weapons, directed-energy weapons (DEW) and other novel forms of military power, in addition to enhancing their conventional forces. The world could be confronted with a new arms race of unpredictable and potentially disastrous consequences. One possibility could be a major protracted conflict in which both sides begin a race to (re)develop nuclear weapons.

---

97 Rhodes, *Dark Sun: The Making of the Hydrogen Bomb*, p. 282.

98 Ibid.

99 Andrew F. Krepinevich, *Revolution at Sea: The US Navy and Carrier Aviation*, unpublished manuscript, Center for Strategic and Budgetary Assessments, 2000, pp. 14-17; and Walter Isaacson, *Kissinger: A Biography* (New York: Simon and Schuster, 1993), p. 436.

Making the World Safe for World War III?

As implied above, in a nuclear-free world where today's nuclear powers can no longer rely on their nuclear arsenals to offset their inferiority in other areas of the military competition, states could gravitate toward a competition in conventional military capabilities or new forms of military power. While even countries with small nuclear arsenals have discouraged countries with much larger nuclear forces from attacking them,[100] the same cannot be said with respect to countries whose conventional forces are greatly inferior to those of their enemies. (Indeed, this is likely a strong motivating factor for countries like North Korea and Iran to acquire nuclear weapons.) Engaging in a conventional arms competition would prove costly, especially for the United States, a country with global interests and responsibilities. The US defense budget share allocated to nuclear weapons has for decades represented a small slice of the overall budget.[101]

Moreover, it is far from clear that the absence of nuclear weapons would decrease the risk of large-scale conflict. In the sixty-four years since the invention of nuclear weapons, there have been no major wars among the great powers, while in the thirty-one years preceding the invention of nuclear weapons, there were two global wars.

---

[100] The United States contemplated preventive war against both China and the Soviet Union while these powers' nuclear arsenals were small, but did not proceed. The Soviet Union considered a preventive nuclear strike on China during the late 1960s when its arsenal was small but, like the United States, did not follow through. Marc Trachtenberg, *History and Strategy* (Princeton: Princeton University Press, 1991), chap. 3; William Burr and Jeffrey T. Richelson, "Whether to 'Strangle the Baby in the Cradle': The United States and the Chinese Nuclear Program, 1960-64," *International Security*, Winter 2000/01; and Avery Goldstein, *Deterrence and Security in the 21st Century: China, Britain, France, and the Enduring Legacy of the Nuclear Revolution* (Stanford: Stanford University Press, 2000), pp. 101, 107. Nor has the United States attacked North Korea, an enemy who recently demonstrated a nuclear weapons capability.

[101] Between 1940 and 1996, the United States spent $5.5 trillion on its nuclear weapons program—29 percent of its total military spending over that period. Steven I. Schwartz, "The Cost of U.S. Nuclear Weapons," *Nuclear Threat Initiative*, October 2008, accessed at http://www.nti.org/e_research/e3_atomic_audit.html on April 16, 2009. Estimating such costs is as much an art as a science. This figure is significantly larger than any previous official or unofficial estimate of nuclear weapons expenditures, and thus should be treated as an upper bound.

The deaths suffered in the two world wars alone far exceed those incurred since the introduction of nuclear weapons.[102]

Simply stated, the implicit risk of suffering immediate and catastrophic destruction to one's society and economic infrastructure from a nuclear attack has been a powerful deterrent to those states contemplating war. What will replace this powerful deterrent once it is gone?

A Nuclear Condominium?

Ironically, perhaps the best chance of moving toward a de-proliferated world, if not a world without nuclear weapons, would occur in the wake of nuclear weapons use. Should the tradition of non-use of nuclear weapons be broken in such a way as to cause fear of further use among the great nuclear powers, and thereby galvanize them to action, they might band together in a grand coalition of sorts. The objective of this Grand Nuclear Alliance would be to remove all nuclear weapons from those states deemed to be hostile, irresponsible or unstable minor powers, and to prevent by force if necessary the spread of nuclear weapons to any other state or entity. In exchange, the Grand Nuclear Alliance might offer nuclear "guarantees" to all states similar to the commitment made by the United States to those countries under its nuclear umbrella. Such a nuclear backlash could occur following a major nuclear exchange between minor nuclear powers (e.g., Iran and Israel; India and Pakistan). Such an event would likely horrify the world. It might also create severe second-order effects on the international system, such as a nuclear exchange that disrupts or destroys much of the Persian Gulf's energy production. Similarly, any nuclear attack on a major power, whether emanating from a "rogue" nuclear power or a nonstate entity, could also trigger a severe backlash against nuclear proliferation in the developing world.

Ironically, perhaps the best chance of moving toward a de-proliferated world, if not a world without nuclear weapons, would occur in the wake of nuclear weapons use.

While the prospect of a nuclear condominium merits serious examination, it is beyond the scope of this report. Moreover, the goal of such a group would not involve creating a nuclear-free world, although it could lead to a less proliferated world than the one that exists today.

---

[102] Deaths suffered in World War I are estimated at 21.5 million soldiers and civilians, while estimated deaths in World War II range between 35 and 60 million soldiers and civilians, for a total of between 56.5 and 81.5 million fatalities. In the large-scale conflicts involving a major power that have taken place in the sixty-four years since World War II, the total number of fatalities is estimated at approximately seven million (2.5 million deaths during the Korean War, 3.4 million deaths in Vietnam beginning in 1954, 15,000 Soviet soldiers and one million Afghans during the Soviet invasion and occupation of Afghanistan, 300 allied troops and between 8,000 and 100,000 Iraqi soldiers during the First Gulf War, 4,596 coalition troops and nearly 100,000 Iraqi civilians in operations since 2003, and 1,130 coalition troops and some 8,800 Afghan civilians since 2001). Sources: *MSN Encarta*, *Encyclopedia Britannica Online* (Academic Edition), and "War Casualties to Date," April 25, 2009, accessed at http://www.washingtonpost.com/wp-dyn/content/article/2009/04/24/AR2009042403681.html?Sub=AR on April 27, 2009. While these data do not prove that nuclear weapons have greatly lowered the risk of major war and widespread human suffering, they do challenge the assertion that a nuclear-free world will be a far more placid world than we have experienced over the past sixty-four years.

BABY STEPS

Dark Alleys Along the Path

Nuclear abolitionists generally admit that the path to achieving their ultimate goal is likely to be long and difficult, and so they advocate taking a series of interim steps to generate momentum along this path. In so doing, they risk evaluating the desirability of each step solely in terms of whether it advances the aim of moving further along the path to zero. Setting aside the debate over whether or not the ultimate destination of a nuclear-free world is desirable or even achievable, one must still take into account the matter of whether these initial "baby steps" would lead the world down many dangerous stretches along the chosen path — dangers that would not exist had the world not embarked on such a journey.

This section examines some of the risks that may exist along the path toward a world without nuclear weapons. As a baseline we will explore several initiatives advanced by the nuclear abolitionists that have also been embraced by the Obama Administration, to include a commitment to "set a goal of a world without nuclear weapons, and pursue it." Toward this end, the administration reaffirms its determination to "always maintain a strong deterrent as long as nuclear weapons exist." However, to move "down the long road toward eliminating nuclear weapons" the president has also pledged to "stop the development of new nuclear weapons; work with Russia to take US and Russian ballistic missiles off hair trigger alert; seek dramatic reductions in US and Russian stockpiles of nuclear weapons and material; and set a goal to expand the US-Russian ban on intermediate-range missiles so that the agreement is global."[103] These steps closely conform to those advocated by nuclear abolitionists. Are these steps desirable? Practical? Consistent? The following assessment suggests a mixed bag.

Dramatic Reductions of US and Russian Nuclear Weapons and Material

As noted above, some nuclear abolitionists argue that the United States can safely reduce its deployed nuclear warhead levels — currently projected at between 1,700 and 2,200 — to 1,000 or fewer, especially if the Russians were to do the same. There would be some benefits if the Russians were inclined to join in such a move, the obvious ones being that there would be fewer Russian nuclear weapons to concern American defense planners and, prospectively, fewer Russian weapons that needed to be secured against the risk of theft or entry into that country's black market.

Regarding overall numbers, however, there is at least one important asymmetry that must be addressed. It involves the substantial number of states that are sheltered

[103] "Barack Obama and Joe Biden's Plan to Secure America and Restore our Standing," accessed at http://origin.barackobama.com/issues/foreign_policy/#nuclear, on April 2, 2009.

under the US nuclear umbrella — the states to which Washington has given a guarantee that the United States will respond decisively against any enemy state that employs nuclear weapons against them. To the states under the nuclear umbrella — including America's NATO allies, Australia, Japan and South Korea — the implicit understanding is that the United States will retaliate with nuclear weapons in the event of a nuclear attack on their country. Anything less would represent a weakening of deterrence against such an attack. This nuclear guarantee is a major reason why countries like Japan and South Korea, who could field nuclear arsenals of their own, have refrained from doing so. Russia does not have anything like this level of commitment.

Consequently, the United States must be prepared to defend both itself and over a dozen other countries from nuclear attack. Further compounding the problem, as the number of hostile nuclear powers (e.g., Iran, North Korea) increases, and as potential rivals such as China expand their nuclear arsenals,[104] the demands on the US nuclear deterrent seem likely to exceed those of the Russian arsenal, and by a significant margin.

Reductions in non-deployed nuclear weapons would also seem to make sense, especially if the deployed weapons were judged to be reliable enough that no reserves were needed. Yet, as will be discussed presently, this initiative likely works against the administration's commitment to "stop the development of new nuclear weapons" and "maintain a strong deterrent." Reductions here also make sense if there is high confidence that neither side will attempt to break out of the agreement by quickly building up its nuclear capabilities. This implies the need to have very strong monitoring and enforcement regimes in place to guard against cheating. As noted above, such regimes have not always been successful in the past, to put it mildly.

Indeed, a wholly different dynamic seems to be at work in successful mutual arms reductions. Countries whose interests closely coincide, and which are bound by a strong sense of shared values — such as the United States, Great Britain and France — have no need to monitor reductions in their nuclear armaments, as they do not view one other as threats. On the other hand, countries that are rivals are constantly seeking an advantage, or taking steps to ensure the other side does not develop one. Perhaps it is that successful arms reductions are more a product of common aspirations than of treaties and enforcement regimes, and that long-term success resides in the former, rather than the latter.

There is yet another factor that must be considered: the disposition of other powers. As the Americans and Russians reduce their nuclear armaments, it has been asserted that this will be viewed as a demonstration to other countries that the value of nuclear weapons in international relations is diminishing. This, it is argued, will act as a disincentive to other countries to pursue nuclear armaments of their own. But will it? One can easily fashion an alternative case that dramatic reductions in US and

---

[104] Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People's Republic of China 2009* (Washington, DC: Department of Defense, 2009), pp. 24-25.

Russian nuclear weapons will so lower the threshold (and the cost) to nuclear great power status that it will actually spur some other nuclear powers to seek parity with the two Cold War nuclear superpowers. How might such an outcome be avoided? If it cannot, would a multi-polar nuclear world represent a stable stretch along the path toward nuclear abolition? How would the United States calculate its nuclear weapons requirements in a world where both China and Russia each had one thousand nuclear weapons?[105] What if the calculus were further complicated by countries like Iran, North Korea and Pakistan having fifty to a hundred nuclear weapons each? Would the world be a more or less stable place than it is today? Would the likelihood of nuclear use have increased or reduced? These questions, while beyond the scope of this assessment, should be thoroughly examined before embracing what amounts to a 50 percent or more reduction in the United States' nuclear forces.

Would a multi-polar nuclear world represent a stable stretch along the path toward nuclear abolition?

Multilateral Missile Defenses

As leading advocates for a US nuclear policy and strategy centered on the goal of a world without nuclear weapons, the Four Horsemen encourage initiating negotiations toward developing cooperative multilateral ballistic-missile defenses and early warning systems. "This should include agreement on plans for countering missile threats to Europe, Russia and the US from the Middle East, along with completion of work to establish the Joint Data Exchange Center in Moscow." They support their call for such negotiations on the basis that

> Reducing tensions over missile defense will enhance the possibility of progress on the broader range of nuclear issues so essential to our security. Failure to do so will make broader nuclear cooperation much more difficult.[106]

This proposal is fraught with unanswered questions. Who will pay for these defenses? Who gets to man them? Who decides what targets take priority in the event of an attack? Does this scheme involve the transfer of sensitive technologies? If so, how will they be safeguarded? What kinds of enforcement mechanisms are to be put in place in the event the safeguards are breached? A successful intercept of a ballistic missile must be accomplished along very tight timelines: How many countries will have to approve an order to fire the missile defense interceptors? What country has priority in terms of its defense in the event that more than one country is attacked? These are just a few of the unanswered questions that must be resolved in order for a multilateral missile defense scheme to prove effective. By implication, this raises

---

[105] This does not address the sizeable number of nuclear weapons Russia possesses in addition to strategic nuclear weapons. Russia also has over 1,000 non-strategic nuclear weapons in addition to those counted under the START and SORT agreements. Also outside the counting rules are roughly 4,000 nuclear weapons associated with missile and air defense, and weapons awaiting dismantlement or in reserve. Norris and Kristensen, "Russian Nuclear Forces," pp. 55, 57.

[106] Shultz et al., "Toward a Nuclear-Free World."

the broader question of whether a multilateral missile defense regime is a realistic possibility.

Secure Nuclear Weapons and Fissile Materials

Efforts to enhance the security of nuclear weapons and nuclear weapons materials (i.e., enriched uranium and plutonium) have been ongoing since the early 1990s, most notably as part of the so-called Nunn-Lugar program.[107] The program has yielded some notable successes. Efforts to secure both nuclear weapons and fissile materials should continue and be enhanced where possible, especially with respect to nuclear-armed states characterized by government corruption, incompetence or instability. Having said that, such efforts do not represent a significant departure from current practices.

End the Development of Nuclear Weapons

Many advocates of a nuclear-free world argue that in order to strengthen the NPT, the United States should forego developing any new nuclear weapons. This, they believe, would signal a US commitment to pursue a path toward eventual nuclear disarmament, an obligation of nuclear weapons states under the treaty. At first blush, this seems to make eminent sense. The United States built tens of thousands of nuclear weapons during the Cold War. The US nuclear forces today are a small fraction of those that were fielded in the long struggle with the Soviet Union. Why would it need to build more? Opponents of foreswearing the development of new nuclear weapons offer three reasons: first, weapons design teams have very specialized skills that risk being lost if they are not put to use; second, the United States may, at some point, need to develop a new generation of nuclear weapons to address security challenges for which there may be no other alternative; and third, the existing stockpile of nuclear weapons is becoming less reliable as it ages, necessitating a replacement of old weapons with newer, reliable ones known as reliable replacement warheads, or RRWs.

The current debate centers on the third issue, the need (or lack thereof) for the RRW. The decision on this issue will likely have a major impact on the other two. Those advocating the RRW note that both the plutonium pits and the warhead components in US nuclear weapons are aging. This is because most US nuclear warheads were built in the 1970s and 1980s and are being retained longer than was planned.

---

[107] Also known as the Cooperative Threat Reduction (CTR) Program, this initiative provides US funding and support to states in the former Soviet Union (including Russia, Ukraine, Georgia, Azerbaijan, Uzbekistan, and Kazakhstan) in decommissioning their nuclear, biological, and chemical weapon stockpiles, as agreed by the Soviet Union under various arms control agreements, and insuring that critical components are placed in secure storage facilities. Since the program's inception in 1991, it has contributed to the deactivation of thousands of nuclear warheads and to the safeguarding of large quantities of fissile materials. The National Academies, "Under White House Leadership, Cooperative Threat Reduction Programs Should Be Revamped to Address 21st Century Threats," March 6, 2009, accessed at http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=12583 on April 4, 2009.

They believe efforts like the Department of Energy's Stockpile Stewardship Program (SSP) and its Life Extension Program (LEP) are reaching the limits of what they can reasonably be expected to accomplish in terms of maintaining the reliability of the nation's nuclear weapons.

The reliability of these aging weapons could be confirmed with testing. However, the United States has observed a test moratorium since 1992, and opponents of the RRW (as well as the Four Horsemen) are calling for the United States to ratify the Comprehensive Test Ban Treaty (CTBT), which would permanently ban all nuclear weapons testing. The Obama Administration intends to seek Congressional ratification of the treaty, foreclosing this option for certifying the reliability of the US nuclear deterrent.[108]

Can the United States' nuclear warheads be maintained with high confidence in their reliability, in the absence of nuclear testing, by replacing deteriorating components with new ones?

Absent testing, the method adopted to maintain the nuclear stockpile's reliability involves rebuilding existing warheads with components as similar as possible to original specifications. Since 1992 the Secretaries of Defense and Energy have used this approach to certify stockpile safety and reliability in the absence of nuclear testing.[109] The National Nuclear Security Administration (NNSA), which oversees the US nuclear weapons programs, is concerned that it will become progressively more difficult to certify current warheads using this approach as even small variations in replacement components may erode warhead reliability. Simply stated: Can the United States' nuclear warheads be maintained with high confidence in their reliability, in the absence of nuclear testing, by replacing deteriorating components with new ones?

During the Cold War, this question never had to be answered, since the United States regularly modernized its nuclear forces, to include both delivery systems and warheads. This ceased with the end of the Cold War. On the positive side, the SSP and related efforts have enabled NNSA to enhance its understanding of warhead deterioration, to include ways to mitigate it and prevent it.[110] Yet nuclear warheads are exquisitely designed weapons. Some components are difficult to fabricate or involve the use of hazardous substances. Assembling these components can be tricky. Consequently, NNSA administrator Linton Brooks concluded that

> it is becoming more difficult and costly to certify warhead remanufacture. The evolution away from tested designs resulting from the inevitable accumulations of small changes

---

[108] In a speech on April 5 in Prague, President Obama stated that "To achieve a global ban on nuclear testing, my administration will immediately and aggressively pursue US ratification of the Comprehensive Test Ban Treaty." "Obama Prague Speech on Nuclear Weapons," accessed at http://www.huffingtonpost.com/2009/04/05/obama-prague-speech-on-nu_n_183219.html, on April 9, 2009.

[109] Nuclear Weapons Complex Assessment Committee, *United States Nuclear Weapons Program: The Role of the Reliable Replacement Warhead* (Washington, DC: American Association for the Advancement of Science, 2007); accessed at http://cstsp.aaas.org/content.html?contentid=899, on April 8, 2009.

[110] Jonathan Medalia, "The Reliable Replacement Warhead Program: Background and Current Developments," *Congressional Research Service* (CRS), September 12, 2008, p. 6.

over the extended lifetimes of these systems means that we can count on increasing uncertainty in the long-term certification of warheads in the stockpile.[111]

Advocates of the RRW argue that it offers a superior method of certifying the reliability of the US nuclear stockpile, and might be done without testing. On March 2, 2007, a Lawrence Livermore National Laboratory design was chosen to be the first RRW; however, the following year Congress blocked funding for the program and the Obama Administration has not included funding for the program in its Department of Energy (DoE) budget. Instead, emphasis will remain on LEP efforts.[112]

The administration's position conforms to the views of the RRW critics. Many advocates of a total ban on new nuclear weapon development are concerned that even the RRW program will undermine the NPT. They believe the LEP and SSP can maintain the stockpile for an extended period of time, and fear that untested RRWs may ultimately lead to demands for a resumption of nuclear weapons testing, thereby undermining the CTBT, which they assume will be ratified by the Senate. In supporting their views, opponents note that recent studies have found that the plutonium primaries, or pits, of most US nuclear weapons may have minimum lifetimes roughly twice as long as previous official estimates. They assert that LEP efforts can resolve issues associated with the other weapon components.[113]

---

111 Ambassador Linton Brooks, Statement to Senate Armed Services Committee, April 4, 2005, p. 3. Cited in Jonathan Medalia, "The Reliable Replacement Warhead Program: Background and Current Developments," *Congressional Research Service* (CRS), September 12, 2008, pp. 7, 9. Nuclear warhead components comprise two categories: those that are part of the nuclear explosive package (NEP), and those that are not, such as components of the arming system and the weapon's outer casing. The components of the latter far exceed those of the former in number and can be subjected to rigorous testing and certification. The NEP components, however, cannot be similarly tested in the absence of a nuclear detonation. As noted above, the United States has observed a moratorium on nuclear testing since 1992. Consequently, the reliability of NEP components is at the heart of the debate over warhead reliability. Yet warheads contain several thousand components and, as noted, some are difficult to fabricate; others may be hard to assemble. As a result, extending the life of a warhead is a highly complex undertaking requiring years to complete. The LEP for the W76 warhead for Trident submarine-launched ballistic missiles involves the following: "Activities include design, qualification, certification, production plant Process Prove-In (PPI), and Pilot Production. The pre-production activities will ensure the design of refurbished warheads meets all required military characteristics. Additional activities include work associated with the manufacturability of the components including the nuclear explosive package; the Arming, Firing, and Fuzing (AF&F) system; gas transfer package; the Arming, Firing, and Fuzing (AF&F) system; gas transfer system; and associated cables, elastomers, valves, pads, cushions, foam supports, telemetries, and miscellaneous parts."

112 "A New Era of Responsibility: Renewing America's Promise: The US Department of Energy's 2010 Budget," accessed at http://www.whitehouse.gov/omb/assets/fy2010_factsheets/fy10_energy.pdf, on April 10, 2009. The administration states that "Development work on the Reliable Replacement Warhead ceases, while continued work to improve the nuclear stockpile's safety, security, and reliability is enhanced with more expansive life extension programs."

113 Daryl G. Kimball, "New Reasons to Reject New Warheads," Arms Control Today, January/February 2007; and Nuclear Weapons Complex Assessment Committee, *United States Nuclear Weapons Program: The Role of the Reliable Replacement Warhead* (Washington, DC: American Association for the Advancement of Science, 2007); accessed at http://cstsp.aaas.org/content.html?contentid=899, on April 8, 2009.

Opponents of the RRW also assert that there are no military requirements for new weapons. This view is hotly contested by those who argue that if the United States could design its nuclear weapons using a "clean sheet of paper," its nuclear stockpile would look very different from its Cold War ancestor. Noting the changes in US strategy and military missions since the Soviet Union's demise, Linton Brooks believes the existing stockpile is poorly structured to support them. He states that "we would [now] manage technical risk differently, for example, by 'trading' [warhead] size and weight for increased performance margins, system longevity, and ease of manufacture." Existing warheads are not designed for longevity or to minimize cost. Given improvements in weapon accuracy, their yields are likely too high, while they lack capabilities against buried targets or biological and chemical munitions, and they do not take full advantage of precision guidance.[114]

Finally, RRW supporters argue that the NPT can be better strengthened by replacing nuclear warheads than by refurbishing them. Currently, a substantial number of nuclear weapons are maintained as insurance against unanticipated failures in the aging nuclear stockpile. With the RRW, assert its advocates, these reliability issues will not be present, and the United States can safely and substantially reduce the number of reserve weapons in its inventory.

The United States retains "hedge" warheads in large part due to the inability of either today's nuclear infrastructure, or the infrastructure we expect to have when the stockpile reductions are fully implemented in 2012, to manufacture, in a timely way, warheads for replacement or for force augmentation, or to act to correct unexpected technical problems.[115]

Since the challenge of extending the life of nuclear weapons is *terra incognita*, advocates of relying on the LEP in lieu of the RRW challenge every argument made by proponents of the latter approach. They note that no one can predict if and when life-extended warheads might degrade to the point where there is a loss of confidence in their reliability. The LEP proponents note that, unlike existing warheads which have been tested, the RRW could not be tested if the United States ratifies the CTBT, leading to questions regarding its reliability. Given that all warhead designs have some form of "birth defects," they argue that the RRW program simply replaces one set of uncertainties for another, preventing significant reductions in the overall stockpile and—worst of all—ultimately requiring a resumption of nuclear weapons testing.[116]

What are we to make of all this? It appears the United States has two overriding objectives when it comes to the issue of nuclear weapons: maintaining an effective nuclear arsenal, and limiting (and ultimately reducing) the number of nuclear

---

[114] K. Henry O'Brien, Bryan L. Fearey, Michael R. Sjulin, and Greg A. Thomas, *Sustaining the Nuclear Enterprise—A New Approach, Lawrence Livermore, Los Alamos, and Sandia National Laboratories*, UCRL-AR-212442, LAUR-05-3830, and SAND-2005-3834, May 20, 2005, pp. 2-4.

[115] Ibid., p. 3.

[116] Medalia, "The Reliable Replacement Warhead Program: Background and Current Developments," pp. 11-12.

weapons to the point of elimination. In the words of President Obama, the goal is to ensure that "As long as [nuclear]…weapons exist, the United States will maintain a safe, secure and effective arsenal to deter any adversary…." while at the same time…"strengthen the Nuclear Non-Proliferation Treaty" and "achieve a global ban on nuclear testing…[by] immediately and aggressively pursu[ing] U.S. ratification of the Comprehensive Test Ban Treaty."[117]

These objectives may be incompatible. The best way to ensure the reliability of the existing US nuclear stockpile would be to test either existing weapons or the RRWs. This would enable reductions in the overall stockpile by reducing the number of so-called responsive reserve warheads and enable the United States to take another step forward in meeting its obligations under the NPT. There seems to be little dispute that this is possible.

Yet nuclear testing, whether of existing weapons or replacement weapons, is viewed by NPT advocates as detrimental to the treaty, and to the overall objective of moving toward nuclear disarmament. They assert that this provides an excuse for other states to improve their arsenals and conduct their own tests. Moreover, they argue, it also encourages would-be nuclear-armed states to proceed in their efforts in the knowledge that the United States, through its testing, has effectively legitimized the testing of their weapon designs.

Advocates of testing reject this logic. They note that the US moratorium has not prevented states bent on acquiring nuclear weapons—India, North Korea and Pakistan—from either acquiring them or from testing them.

The US moratorium has not prevented states bent on acquiring nuclear weapons—India, North Korea and Pakistan—from either acquiring them or from testing them.

Thus, it appears the real issue is less one of retaining existing warheads or moving to a reliable replacement warhead, but rather one of testing. As one group of experts concludes: "There are risks in either long-term outcome—a stockpile that would be composed of all or mostly RRWs, or one that would be composed of all or mostly legacy warheads—and it is difficult today to weigh the pros and cons."[118] Simply put, the United States must either accept long-term risk in its ability to "maintain a safe, secure and effective [nuclear] arsenal" or the risk associated with testing that might obviate the need for further nuclear weapons production, but also enable substantial reductions in the US nuclear stockpile.

CONCLUSION: THE ILLOGIC OF ZERO?

A world free of nuclear weapons, one that implies the root causes of conflict between states have been overcome and the dangers of a more proliferated world avoided, seems a world well worth aspiring to, and sacrificing for. But is such a world achievable? In 1952, when the Soviet Union's nuclear weapons program was in its infancy

---

[117] "Obama Prague Speech on Nuclear Weapons."

[118] Nuclear Weapons Complex Assessment Committee, *United States Nuclear Weapons Program: The Role of the Reliable Replacement Warhead*.

and the United States nuclear weapons program was gathering momentum, Robert Oppenheimer chaired a State Department panel on nuclear disarmament for Dean Acheson in 1952, among whose four whose members included Vannevar Bush and Allen Dulles. McGeorge Bundy served as rapporteur. The panel's observations are a worthy conclusion to this chapter. Like the Nuclear Abolitionists, the panel found that "[U]nless the contest in atomic armaments is in some way moderated, our whole society will come increasingly into a period of the gravest kind."[119]

While giving voice to the fears of those advocating the need to ban such horrible weapons, the Panel also understood human nature and the realities of the human condition, concluding that however desirable efforts to control the nuclear programs of the two nuclear-armed states might be:

> No regulation of armaments, however limited, has ever proved feasible except as part of a genuine political settlement….
>
> Fundamentally, and in the long run, the problem which is posed by the release of atomic energy is a problem of the ability of the human race to govern itself without war. There is no permanent method of excising atomic energy from our affairs, now that men know how it can be released. Even if some reasonably complete international control of atomic energy should be established, knowledge would persist, and it is hard to see how there could be any major war in which one side or another would not make and eventually use atomic bombs. In this respect the problem of armaments was permanently and drastically altered in 1945.[120]

It appears the advocates of centering US nuclear weapons policy on the goal of global nuclear disarmament have considerable barriers to surmount. These barriers are only partially practical in nature; there is also the matter of whether a nuclear-free world would necessarily be a safer world, or whether such a world would be one in which the best values of Western Civilization, such as individual liberty, democracy, and the free-enterprise system, would endure.

President Obama's Prague speech provides an example of the illogic involved in going to zero nuclear weapons. In the speech, the president declares that nuclear-armed states cannot be relied upon to cooperate in their own self-interests to stop short of using nuclear weapons. As the president declared, "if we believe that the spread of nuclear weapons is inevitable, then in some way we are admitting to ourselves that the use of nuclear weapons is inevitable."[121]

---

[119] Cited in Bowie and Immerman, *Waging Peace*, pp. 223-24. See also Bundy, *Danger and Survival* , pp. 288-290.

[120] Cited in Rhodes, *Dark Sun: The Making of the Hydrogen Bomb*, p. 588. See also Bundy, *Danger and Survival: Choices About the Bomb in the First Fifty Years*, pp. 288-89. President Eisenhower was much influenced by the group's report, urging Oppenheimer to publish a version of it in *Foreign Affairs*. The report stimulated Eisenhower's thinking along lines that led to his "Atoms for Peace" initiative. See Newhouse, *War and Peace in the Nuclear Age*, pp. 92, 107.

[121] "Obama Prague Speech on Nuclear Weapons."

On the other hand, the president declares that

> But we go forward with no illusions. Some countries will break the rules. That's why we need a structure in place that ensures when any nation does, they will face consequences.[122]

Thus the president believes that states that *cannot* be trusted to act in their self-interests to avoid nuclear weapons use *can* be relied upon to cooperate in their own self interests to eliminate all of their nuclear arms, and, once that has been accomplished, they *can* also be relied upon to cooperate in their own self interests to prevent, by military force if necessary, anyone from breaking the rules and again fielding nuclear weapons. Simply put, states cannot be relied upon not to use nuclear weapons if they possess them, but they can be relied upon to disarm themselves of their nuclear weapons, despite knowing that "some countries will break the rules." They can also then be relied upon to go to war if need be—even against a major power that has managed to build covertly a small nuclear monopoly—to enforce nuclear disarmament.[123]

This logic is far from persuasive.

Given these formidable barriers, even those who continue to advocate for a nuclear-free world might see the virtue in developing a "Plan B" policy should their ambitious objectives fail to materialize. Indeed, based on the analysis to this point, it appears likely the future we will inhabit will see a significantly more proliferated world than that which exists today. Prudent planning requires that this future—unpleasant to contemplate though it may be—and its implications for US nuclear forces be examined as well, rather than be shunted aside through willful ignorance on our part. This future, the future of a "Proliferated World," is the focus of the next two chapters.

Even those who continue to advocate for a nuclear-free world might see the virtue in developing a "Plan B" policy should their ambitious objectives fail to materialize.

[122] Ibid.

[123] I am indebted to my colleague Barry Watts for this insight into President Obama's speech.

CHAPTER 4 > THE UNLIT PATH: IRAN AND A PROLIFERATED MIDDLE EAST

Given that the road to nuclear weapons abolition may be long and littered with obstacles, prudent security planners must also prepare to confront a world in which these efforts fail. Some may argue that even to think about a more proliferated world is dangerous, since it may lead to defeatism and become a self-fulfilling prophecy. Yet the risks of confronting such a world unprepared far outweigh the risks of ignoring what seems likely to occur. Indeed, appreciating the consequences of nuclear proliferation may encourage the world to take aggressive actions to prevent it. There are many possible paths toward a more proliferated world. This chapter presents what is arguably the most likely path: Iran's acquisition of a nuclear weapons capability. It then outlines some prospective consequences for global security in general and US security in particular.

PROLIFERATION AT THE GATES: IRAN'S NUCLEAR GAMBIT

While there is continued debate over Iran's *intentions*, Tehran is, at a minimum, almost certainly engaged in a large-scale effort to acquire the *capability* to build nuclear weapons. The Obama Administration has echoed the Bush Administration's concerns on this matter. Accordingly, the new administration's ambassador to the United Nations, Susan Rice, recently declared that the United States "will seek to end Iran's ambition to acquire an illicit nuclear capability…."[124] Persistent (albeit fitful) efforts by the international community to dissuade Iran from its apparent objective have yet to succeed. Tehran has successfully moved a considerable way along the path toward acquiring nuclear weapons. It has working uranium mines near Yazd and Bandar Abbas. Uranium "yellowcake" ore is being processed into uranium hexafluoride feed-

[124] "Rice: U.S. will seek to end any 'illicit' nuclear ambitions by Iran," *CNN.Com/World*, February 26, 2009, accessed at http://edition.cnn.com/2009/WORLD/meast/02/26/us.iran/ on March 3, 2009.

stock at the Esfahan Nuclear Technology Center. The uranium centrifuge enrichment plant at Natanz has the potential to produce weapons-grade highly enriched uranium (HEU). Revealingly, research on uranium enrichment by laser isotope separation was undertaken without the IAEA's knowledge. A nuclear reactor is under construction at Bushehr, while a heavy water reactor suitable for plutonium production is being built at Arak.[125] While it may be hoped that the international community—in particular, the EU-3 and the United States—might prevail upon Iran to forego nuclear arms, absent the use of force it appears there is little that can be done to deflect the Iranians from their apparent goal. It seems only prudent, then, to assess the prospective consequences of Iran's achieving a nuclear potential.

A nuclear-capable Iran may prove far more destabilizing than North Korea's emergence as a nuclear-armed state. North Korea is surrounded either by generally friendly nuclear powers (Russia and China) or states (Japan and South Korea) that are firmly under the US nuclear umbrella, thanks to long-standing formal security commitments. Iran however has four nuclear neighbors, only one of which (Pakistan) is a Muslim state. Two others, India and Russia, have friendly relations with Iran but no formal security relationship. The fourth nuclear-armed power, Israel, is, along with the United States, considered by Tehran to be a mortal enemy. Israel has been a nuclear power for over three decades and is believed to have a nuclear arsenal of several hundred weapons.[126] Turkey, while not a nuclear power, is a member of NATO and thus is considered to be under the US nuclear umbrella. With the exceptions of Israel and Turkey, no other states in the Middle East have either nuclear arms or a US nuclear guarantee. Some states—Algeria, Egypt, Iraq, Saudi Arabia, and Syria—may have both the means and the motive to develop nuclear arms in the event that Iran becomes a nuclear-armed state, or is perceived to have the ability to field a nuclear arsenal in short order.

IRAN: STOPPING SHORT OF THE BOMB

Given the potential cascade of nuclear proliferation that may follow any overt declaration of a nuclear capability, Iran may judge that its interests are best served by establishing a "latent" or "virtual" nuclear capability along the lines of what Israel

---

[125] Reed and Stillman, *The Nuclear Express*, pp. 292-93.

[126] According to estimates, Israel possesses between 100-200 nuclear weapons. R.S. Norris, W. Arkin, H.M. Kristensen, and J. Handler J, 'Nuclear Notebook', *Bulletin of the Atomic Scientists*, vol. 58, number 5, 2002, pp. 73-75; and S. Kile and H.M. Kristensen, "World Nuclear Forces: IX. Israeli Nuclear Forces," in *SIPRI Yearbook 2005* (Oxford, UK: Oxford University Press: 2005), pp. 600-602.

has done.[127] The effects, however, of this course of action may not be as benign as has been the case with Israel. Other states may still feel compelled to develop their own "bombs in the basement."

Moreover, even if Iran were to adopt the posture of a "virtual" nuclear-armed state, it could present challenges for the international community. Iran may try to have its cake and eat it too, by leveraging its latent nuclear capability to extort diplomatic and material concessions from the West (much as North Korea is still doing) as part of a nuclear "shakedown" strategy. Iran might also pursue more aggressively its various forms of ambiguous aggression throughout the Middle East and beyond. This could take the form of much more aggressive behavior on the part of Iran's proxies, such as Hamas and Hezbollah in the case of Israel, and the Mahdi Army in Iraq. It might also lead Iran to attempt to broaden its subversive activities to include countries like Egypt, Jordan, Kuwait, Saudi Arabia and the United Arab Emirates (UAE). Miscalculation here could lead to a nuclear confrontation between Iran and Israel and/or the United States. Evidence of Iranian action along these lines could incentivize targeted Arab states to pursue a nuclear capability of their own.

Iran may try to have its cake and eat it too, by leveraging its latent nuclear capability to extort diplomatic and material concessions from the West (much as North Korea is still doing) as part of a nuclear "shakedown" strategy.

There might be serious drawbacks for Tehran, as well, in adopting a virtual nuclear posture. One is the threat of an Israeli (or US/allied) preventive or preemptive attack, which Iran could not deter by brandishing the threat of nuclear retaliation. Nor could the Iranian people enjoy the pride and prestige they would likely feel if this ancient Persian state were to demonstrate openly its technological prowess through its possession of the world's most fearsome weapon. Indeed, the Iranian people's reaction could be quite the opposite. Having spent enormous resources—resources that are badly needed elsewhere in this developing nation—to arrive at the cusp of nuclear power and then not take the final step could trigger anger and resentment among the people.

POST-NUCLEAR IRAN: NEAR-TERM CONSIDERATIONS

Iran and Israel

If Iran tests a nuclear weapon, the situation for Israel could change dramatically in a manner somewhat similar to that of the United States when the Soviet Union tested its first atomic weapon in August 1949. Israel will have lost its nuclear monopoly in

[127] The question arises whether Iran would be comfortable having a latent nuclear capability without having tested its weapon. The answer is unknown. However, the design of the atomic bomb dropped by the United States on Hiroshima—using highly enriched uranium—had not been tested. (The Trinity test the month before involved a plutonium-based implosion design.) While Israel has never tested a weapon overtly, some assert that the cooperation between France and Israel on nuclear weapons development in the 1950s was so extensive that, when France tested its first atomic weapon on February 13, 1960, "two nations went nuclear with one test." Israel may also have played a strong role in the apparent test of a nuclear device off the coast of South Africa in 1979. Reed and Stillman, *The Nuclear Express*, pp. 79, 177-79.

the region, confronting an implacable enemy that will almost certainly be working to develop a sizeable[128] nuclear arsenal of its own. During the late 1940s and early 1950s both the Truman and Eisenhower administrations weighed the prospective advantages and risks of waging a preventive war against the Soviet Union. One must expect a similar debate in Tel Aviv. The world knows the answer to the US debate. The Israeli debate has yet to occur.

The debate would necessarily center on accepting this major shift in the security environment and adapting to it, or taking action to reverse Iran's actions, by force if necessary. In a strictly military sense Israel would likely be better positioned to derail the Iranian nuclear program before it reached the weaponization phase. Yet the political case for preventive action might be stronger once Iran had openly demonstrated its duplicity in the face of genuine efforts by the international community to assist Tehran in its "peaceful" development of nuclear energy. In any event, few save the most ardent arms control advocates would continue to believe in the power of negotiations to bring about Iranian nuclear disarmament after Tehran had tested a weapon.[129]

Should Israel forego military action against Iran, a bipolar regional nuclear competition could ensue, at least in the near term while other regional powers decide whether or not to enter the nuclear arena. Again, as in the early stages of the Soviet Union's efforts to create a nuclear arsenal, Iran would be highly vulnerable to an Israeli nuclear first strike. Whereas the United States had no record of preventive action against nascent nuclear powers in the early 1950s, Israel has shown a willingness to engage in both preemptive (e.g. the Six-Day War) and preventive strikes (e.g., the 1981 attack on Iraq's Osirak reactor and the 2007 attack on Syria's alleged nuclear facilities).[130] Iran would doubtless try to make it difficult for Israel to wage a successful preventive nuclear war. Tehran has taken steps in its nuclear program both to deceive the international community and to make it difficult to derail the program through conventional military strikes, by dispersing its capabilities and hardening them (e.g., burying them). How would Iran look to offset its "window of vulnerability" between the time it tested a weapon and the time (if ever) it fielded a secure second-strike capability? One possibility is for Iran to produce sufficient quantities of fissile material (highly enriched uranium (HEU) or plutonium) to build a dozen or so weapons before testing a design.

---

[128] Projecting the exact size of an Iranian nuclear arsenal is not possible, owing to myriad factors that would influence the result. However, it seems reasonable to conclude that, having made the enormous effort to acquire the capability to make nuclear weapons, Iran would initially seek to produce at least few score weapons, perhaps as many as fifty, to hedge at least against the prospect of the Israelis conducting a disarming first strike.

[129] With the possible exception of South Africa, no state that has tested a nuclear weapon has disarmed.

[130] The IAEA discovered trace amounts of radioactive material at the site of the Israeli attack on Syria. The Syrian government has failed to cooperate fully with the IAEA, limiting its efforts. Borzou Daragahi, "Speculation Grows Over Syria Site," *Los Angeles Times*, November 20, 2008, p. A-11.

A "Sunni/Arab" Bomb? A Turk Bomb?

Non-nuclear states in the region which feared Iran's new nuclear capabilities would have powerful incentives to acquire nuclear weapons of their own, or to seek new security guarantees from outside powers lest they find themselves coerced into adjusting their policies to accommodate Tehran.[131] Assuming they accepted this dramatic shift in the Middle East power balance, the Western nuclear powers would likely seek to dissuade further proliferation of nuclear arms. One method for accomplishing this during the Cold War, and which has been sustained over the twenty years following the fall of the Berlin Wall, has been the nuclear guarantee extended by the United States to non-nuclear allied states. It has played an important, and perhaps decisive role in the decision by states that are clearly capable of building atomic weapons (Canada, Germany, Italy, Japan, and South Korea, to name a few) to forego a nuclear capability. A possible alternative to a major round of nuclear proliferation would be for states in the region to seek shelter under the nuclear umbrella of a nuclear power such as the United States, or perhaps France or Great Britain. This would require a nuclear-armed state—or states—to commit to defending a non-nuclear armed state.

There appear to be significant problems associated with this concept. For one, the existing US nuclear guarantees cited above were originally directed toward one state: the Soviet Union. In the multipolar world of the Middle East, would the United States be willing to extend a guarantee to Egypt or Saudi Arabia against an Israeli attack, as well as one emanating from Iran? Or would a US guarantee pave the way for these states to engage in antagonistic behavior in the form of ambiguous aggression (e.g., against Israel) similar to concerns arising over how Iran might leverage its nuclear capabilities in more subtle ways? What will the US guarantee be worth if and when countries like Iran develop the capability to strike at the United States directly? While there were doubts during the Cold War that the United States might not risk Chicago to save Bonn, they would seem to pale in comparison regarding the American people's willingness to risk Atlanta to save, say, Riyadh. Finally, it seems almost inconceivable that any Arab state would view as credible a United States "guarantee" to launch retaliatory strikes against Israel.[132] In short, the use of nuclear guarantees, by the United States or other powers, to restrain Arab (or Turk) proliferation in a Middle East inhabited by a nuclear-armed Iran and Israel faces some stiff barriers to achieving the generally salutary effect it did during the Cold War.

While there were doubts during the Cold War that the United States might not risk Chicago to save Bonn, they would seem to pale in comparison regarding the American people's willingness to risk Atlanta to save, say, Riyadh.

[131] Of course, some states that secretly harbor a desire to pursue a nuclear capability may find Iran's nuclear weapons provide welcome excuse to move forward with their plans.

[132] On the other hand, this may not preclude Arab states from welcoming a US nuclear guarantee. Leading states in the Arab World, such as Egypt and Saudi Arabia, have not vigorously pursued nuclear weapons in the forty years since Israel developed its own nuclear weapons, yet seem inclined to do so should Iran acquire nuclear weapons. It may be that a extending the US nuclear umbrella to cover a nuclear threat from Iran could dissuade key Arab states from pursuing a nuclear weapons capability of their own. I am indebted to my colleague Jim Thomas for this insight.

Nuclear Arms Control: The Last Stand?

While arms control advocates may be dealt a heavy blow should Iran achieve a nuclear weapons capability, they are not likely to pack their kit and quietly leave the scene; nor should they. Faced with the prospect of a burst of proliferation throughout the region and the collapse of the Nuclear Nonproliferation Treaty (NPT), those whose goal is nothing short of nuclear abolition may well see Iran's act as presenting a "tipping point" moment where forceful action must be taken lest hopes for progress on the road to eliminating nuclear weapons be dashed forever.

Arab support for a nuclear-free zone is doubtless a function of the fact that Arab states do not have nuclear weapons while two prospective enemies of theirs either have them or may soon have them.

Thus there might be continuing negotiations with the Iranians, somewhat similar to the protracted "shakedown" negotiations apparently ongoing with the nuclear-capable North Koreans. From Tehran's point of view, such negotiations might provide protection against both sanctions by the international community and a preventive attack from Israel. As a bonus, Iran may also reap a series of political and economic concessions from a West desperate to keep the lid on further proliferation and whose populations are unwilling to confront the harsh implications of what has occurred.

In the course of these negotiations, the idea of a nuclear-free zone in the Middle East might be reopened. The matter has long been advanced by the leading Arab states in the region. Of course, Arab support for a nuclear-free zone is doubtless a function of the fact that Arab states do not have nuclear weapons while two prospective enemies of theirs either have them or may soon have them. Suggestions have been made that a good first step toward this goal would see both Iran and Israel cease producing fissile material. Iran seems unlikely to lock itself into a position where Israel has a sizeable nuclear arsenal while it forswears the ability to acquire even a modest capability. It is not surprising that neither has jumped at this opportunity. Israel has paid lip service to the idea of regional nuclear disarmament, but only once there is "a comprehensive peace in the area and there are no dangers of attacks or delegitimization by any other country."[133]

For any regional nuclear-free zone proposal to work, the United States (and perhaps other states) would likely have to "guarantee" they would not invade Iran.[134] This guarantee could be somewhat similar to the guarantee the United States proffered to the Soviet Union following the Cuban Missile Crisis that it would not invade Cuba. There are, however, some obvious differences between that guarantee and one that Washington might make to Iran today. The first is that the guarantee regarding Cuba was not given to the state in question, but rather to its great power sponsor. In Iran's case, there is no offsetting great power sponsor it can call upon to come to its aid if the United States reneges on its word. Moreover, Iran's mullahs cannot be comforted by the fact that, over the past twenty years, the United States, under both Democratic

---

[133] Walter Pincus, "Push for Nuclear-Free Middle East Resurfaces," *Washington Post*, March 6, 2005; p. A24. The quote is from Israeli Ambassador Daniel Ayalon.

[134] Similarly, other states may have to issue similar guarantees that they will not attack Israel.

and Republican administrations, has forcibly unseated the governments of Panama, Haiti, Serbia, Afghanistan and Iraq. They may, however, find genuine succor in the knowledge that the United States has never attempted to overthrow directly the government of a declared nuclear-armed state. In brief, it appears Iran has little to gain and much to lose by taking initial steps toward a nuclear-free Middle East.

If Iran's proliferation is not reversed, either by negotiation or by force, there will likely be efforts to establish "firebreaks" in terms of stemming both horizontal and vertical proliferation. With respect to the latter, it would seem that prompt, long-range delivery systems (i.e., ballistic missiles), weapon miniaturization (i.e., designing weapons that can be delivered by ballistic and cruise missiles) and thermonuclear weapons represent key capability thresholds that would greatly increase Iran's nuclear potential. Control regimes that are currently in place might prove useful in precluding the transfer of key technologies to the Mullahs in Tehran. However, Iran's neighbor, Pakistan, is home to the infamous A.Q. Khan, once the center of a nuclear-arms market that has greatly undermined the international community's nonproliferation efforts. Iran has also benefitted in the past from its relationship with both North Korea and Pakistan—non signatories to the NPT—and, by extension, China. It is far from certain that any arms control regimes could close such a gaping hole in the NPT regime.

A More Aggressive Iran

How would Iran seek to exploit its investment in nuclear arms? Perhaps the most likely approach would be that taken by nuclear-armed states during the Cold War, the United States and Soviet Union in particular. Once both states had begun to field nuclear forces, the competition focused increasingly on indirect methods for advancing their interests.[135] Avoiding direct military contact, and according each other's homeland sanctuary from direct attack, both nuclear superpowers employed forces abroad to support friendly governments, or to unseat certain regimes that opposed them. Thus the United States defended governments threatened by Soviet-supported aggression or subversion (e.g., El Salvador, Greece, the Philippines, South Korea, and South Vietnam) while also looking for opportunities to weaken communist governments (e.g., Afghanistan, Angola, and Nicaragua) backed by Moscow. Both sides often employed proxies to advance their aims. The Soviets, for example, came to rely on the Cubans to provide expeditionary forces in Africa, while the United States sponsored groups like the Contras in Nicaragua and the Mujahedeen in Afghanistan.

If this pattern were to persist following Iran's acquisition of a nuclear capability, Tehran might ratchet up its support for more ambiguous forms of aggression through the use of proxies (e.g., enhanced support for Hamas, Hezbollah, the Mahdi Army, etc.). It might provide these groups with more advanced forms of weaponry or support

[135] For a discussion of nuclear weapons and limited war, see Robert Endicott Osgood, *Limited War-the Challenge to American Strategy* (Chicago: The University of Chicago Press, 1965).

more provocative actions on their part. Iran might also look to expand its operations to other parts of the world, such as Latin America, where Hezbollah has developed a substantial and growing presence.[136] In summary, while Iran may be deterred from employing its nuclear weapons, it may nevertheless pursue its aims more aggressively than in the past, owing to a sense of security derived from a belief that the costs to those contemplating any punitive action against it have become prohibitively high.

LONG-TERM CONSIDERATIONS: A NUCLEAR-ARMED MIDDLE EAST

The proliferation of nuclear weapons to Iran could signal a major expansion in the number of nuclear powers, primarily in the Middle East. By the end of the next decade Algeria, Egypt, Saudi Arabia and Syria could be added to the ranks of the nuclear-armed states, and perhaps Turkey as well. Depending upon developments over the next few years, Iraq could also join this group. What security challenges would such a proliferated region pose to the United States and its principal allies?

It would be risky to assume that, as M. Védrine asserts, new nuclear powers "automatically" view nuclear weapons solely as a deterrent and do not take "absurd risks."

Crisis Stability

How might crisis stability be preserved under these conditions? How might the tradition of nonuse of nuclear weapons be maintained? Indeed, what is stability in a multipolar competition among regional nuclear powers? During the Cold War, Churchill famously observed that "safety will be the sturdy child of terror, and survival the twin brother of annihilation."[137] Then there is Hubert Védrine's observation, cited above, "that a country that possesses the bomb does not use it and automatically enters the system of deterrence and doesn't take absurd risks."[138] To be sure, the Chinese and the Russians do not share the same cultural heritage that the United States, Britain, and France do, and yet both, at least in terms of their actions, adopted the logic of nuclear deterrence. Moreover, neither Pakistan nor India has resorted to using nuclear weapons against one another, despite several crises that emerged since 1998. The fact that Saddam avoided using WMD against the US-led coalition in 1991 suggests that there may be a fairly strong basis for assuming that most—but perhaps not all—states will be extraordinarily reluctant to use these weapons if they acquire them, regardless of their culture or religion.

Yet it would be risky to assume that, as M. Védrine asserts, new nuclear powers "automatically" view nuclear weapons solely as a deterrent and do not take "absurd risks." This may not prove true in a proliferated Middle East. As Churchill noted,

---

[136] Richard Sale, "US Officials: Hezbollah Gaining in Latin America," *Middle East Times*, February 6, 2009, accessed at http://www.metimes.com/Politics/2009/02/06/us_officials_hezbollah_gaining_in_latin_america/5685/, on February 20, 2009.

[137] Winston S. Churchill, "Never Despair," Speech, House of Commons, March 1, 1955, accessed at http://www.winstonchurchill.org/i4a/pages/index.cfm?pageid=11187 on February 18, 2009.

[138] Sciolino, "Chirac's Iran Gaffe Reveals a Strategy: Containment"

a "deterrent does not cover the case of lunatics or dictators in the mood of Hitler when he found himself in his final dug-out."[139] While Saddam Hussein did not employ chemical weapons in 1991, most democratic leaders could not understand the logic of his decisions to choose war with the United States, not once but twice. Others cannot believe that Mahmoud Amadinejad would seriously advocate employing nuclear weapons (should Iran acquire them) to accelerate the arrival of the 12th Imam.[140] But it is only what Iran's leaders think, not what Western diplomats think, that matters. Moreover, Arab culture is strongly rooted in pride and honor, which may at times trump logic and reason. The 1967 Six-Day War was, in no small measure, a consequence of Egypt's leader, Gamal Abdel Nasser, progressively placing his (and his country's) honor on the line to the point where he was faced with either losing face or provoking a war.[141] The prospective weakening of deterrence from its status as a pillar of Cold War era stability is both an argument for those advocating increased urgency along the long path of disarmament, as well as those who caution that it may be time once again to, in the words of Herman Kahn, "think the unthinkable" regarding the prospect of a nuclear war.

Perhaps a better question is: Can crisis stability be maintained in a Middle East populated by up to a half-dozen nuclear powers? Let us assume that crisis stability means preserving a secure second-strike capability. Given this assumption, a Middle East characterized by a multipolar nuclear competition comprising asymmetric and immature capabilities may be a place of great crisis instability. Consider that the likely possessors of nuclear weapons—Algeria, Egypt, Iran, Saudi Arabia, Syria and Turkey—have nowhere near the resources the United States and the Soviet Union were able to devote to ensuring their nuclear arsenals could withstand a surprise attack, and safeguarding their own arsenals against the danger of an accidental or unauthorized launch.

Given relatively limited resources, the newly minted nuclear powers will have some tough choices to make about how they size and shape their forces, and how they control and protect them. Some nuclear-armed states may not be as concerned about maintaining an assured destruction capability against their enemies. Their choice may be between building more nuclear weapons and delivery systems (e.g., missiles and aircraft)[142] or devoting substantial resources toward building hardened missile silos, maintaining expensive strike aircraft on perpetual high alert, and/or (for those

---

[139] Churchill, "Never Despair."

[140] The largest branch of Shi'a Islam holds that the Twelfth Imam is the Mahdi, the savior of mankind. The Twelfth Imam will emerge following a period of great turbulence in the world, when it has descended into chaos.

[141] For a detailed description of the Six-Day War, see Michael Oren, *Six Days of War* (New York: Ballentine Books, 2002). The 1973 Arab-Israeli War was motivated, in large measure, out of a belief that Arab pride needed to be restored after the humiliating debacle six years earlier.

[142] This is not to say that some countries might favor non-traditional delivery means in addition to (or as a substitute for) traditional delivery systems.

with access to the sea) launching a small fleet of missile submarines. There are also choices to be made concerning command and control systems to ensure against unauthorized launch as well as to guarantee that a retaliatory strike can be ordered even after absorbing the first blow. Undertaking even a portion of these efforts may prove prohibitively expensive.

Even assuming a reliable early warning system exists (a big assumption indeed), states might have to place their forces on a "hair-trigger" "use-it-or-lose it" alert.

It may be simpler for a newly armed nuclear power to build more nuclear weapons and delivery systems, and to hide a portion of them in locations that would be difficult to detect, in the hope that this would ensure the survival of a sufficient number of weapons to retaliate in the event of an attack.[143] Should this condition obtain, a single compromise of positional data could produce a major shift in the nuclear balance and perhaps even invite an attack. Here crisis stability could become very much a game of intelligence and counterintelligence. It would be crisis stability of the most fragile sort.

The problems associated with maintaining crisis stability would not end here. Regardless of the specific characteristics of any state's arsenal, crisis stability may be difficult to achieve in a proliferated Middle East. During the Cold War the United States and Soviet Union essentially had to concern themselves with an attack from a single source.[144] In a multi-polar regional nuclear world, one might find four or five or six states armed with nuclear weapons. As an example, if each of six states possessed sixty weapons, any single state could find itself confronting a coalition armed with three hundred weapons against its sixty weapons, giving the coalition a 5:1 advantage in nuclear capability. For the state (or states) on the short end of this balance, the very short flight times associated with an intra-regional nuclear missile strike implies that early warning of an attack might be crucial to any launch-on-warning retaliatory strike. Even assuming a reliable early warning system exists (a big assumption indeed), states might have to place their forces on a "hair-trigger" "use-it-or-lose it" alert. Conversely, if such an alert system were not integrated into a robust command and control system, the risk of unauthorized or accidental launch could increase significantly.[145] Against such a combination, the competitors might find themselves in a

---

[143] It may be that some of the regional nuclear powers will look to hide nuclear weapons abroad. For example, Iran might place some in Syria. Note the earlier mention of Pakistan deploying nuclear weapons to Saudi Arabia. While such a deployment could benefit Saudi Arabia primarily, it could also reduce the risk to Pakistan's own nuclear forces, especially if "extra" weapons were deployed for the principal purpose of insuring their survival.

[144] The nuclear arsenals of the associated powers—France and Great Britain for the United States, and China for the Soviet Union—were small fractions of the overall nuclear forces of the two superpowers.

145 A sea-based deterrent might reduce the risk of suffering a disarming first strike, and thus the need to maintain more vulnerable land-based forces on high alert. However, it is far from clear that the countries in question, save Israel, are capable of operating a sea-based nuclear-armed submarine force within the foreseeable future. Even if they were, certain states might be deterred from doing so owing to concerns that their submarines could be tracked by the United States, the world's clear leader in antisubmarine warfare. Finally, a sea-based deterrent might prove difficult for countries (e.g., Iran; Iraq) whose access to the sea is limited, or whose submarines would have to pass through narrow chokepoints on their way to a deployment.

perpetual arms race, or accept that mutual destruction is not "assured."[146] Due to the historically dysfunctional civil-military relationships in many Middle Eastern states, the prospects that rogue leaders might gain control of nuclear weapons and use them as a tool of both domestic and foreign coercion cannot be discounted. Under such conditions, the risks of nuclear use might increase significantly.[147]

Another possibility is that one or more nuclear powers will remain neutral during an initial exchange, and then move in for the kill against greatly weakened rivals. While this strategy has certainly been pursued in the past,[148] it was not intensively explored as an element of nuclear strategy during the Cold War.[149]

Moreover, absent sophisticated early warning systems, some (if not most) of the new Middle East nuclear powers may be easy prey not only for a preemptive strike, but for one whose origins may be ambiguous. Put another way, absent an early warning system (e.g., early warning satellites, air defense radar stations) that can identify the origins of an attack, the leadership of the targeted state (assuming it has survived) may not know with confidence from where the attack came. Given the likely pressure to respond to the attack, and to do so promptly, there is a risk that a retaliatory strike could target an innocent third party, potentially creating a catalytic regional nuclear war.

Shaping the Competition

Unlike during Cold War era, when the United States and Soviet Union dominated the nuclear competition, might external powers be able to exert a significant influence on a regional nuclear competition? These efforts might be stimulated by a sense that the regional nuclear balance is unstable and that the established nuclear powers, and perhaps other major powers, with their more advanced capabilities, might take steps

---

[146] A classic example that makes the point here is the dreadnought race prior to World War I. The naval competition included a number among the great powers—Britain, France, Germany, Italy, Japan, Russia and the United States. Britain was unwilling to accept anything less than a "two-power standard," which equated to sufficient numbers of dreadnoughts (i.e., modern battleships) equal in number to the number of combined dreadnoughts in the second and third largest navies. (Britain also allied itself, formally or informally, with France, Japan, Russia and the United States.) Germany, which was seeking to become a great maritime power, was left in a much inferior position. Returning to our nuclear example, one can see the potential for the emergence of unstable nuclear balances in a multi-polar nuclear-armed Middle East.

[147] There is the possibility that a country could create a "dead-man's device" or "Armageddon bomb." This approach was popularized in the motion picture "Dr. Strangelove" in which the Soviet Union buries a massive nuclear weapon designed to be triggered in the event of a surprise attack on the country. The weapon would automatically be triggered, spewing such a high level of fallout that the human race would cease to exist.

[148] For example, the Soviet dictator Josef Stalin hoped that, in signing his non-aggression pact with the German dictator, Adolf Hitler, that Germany and the Western allies (i.e., France and Great Britain) would exhaust each other in war, while the Soviet Union built up its strength unencumbered by war. Alan Bullock, *Hitler and Stalin* (New York; Knopf, 1992), p. 612.

[149] This matter has been raised recently by Paul Bracken in "The Second Nuclear Age: How Much has Changed, How Much Remains the Same?" Draft paper, November 17, 2002. I am indebted to my colleague Barry Watts for bringing this matter to my attention.

Even the lesser nuclear powers may see an opportunity to advance a range of interests by aiding Middle East states in their quest for a nuclear capability.

to enhance stability. Powers external to the region can be expected to attempt to influence the nuclear competition for other reasons as well, such as to gain political advantage or access to key resources. Even the lesser nuclear powers (e.g., Pakistan) may see an opportunity to advance a range of interests (e.g., the military balance, access to energy, foreign assistance funding, enhancing its strategic depth) by aiding Middle East states in their quest for a nuclear capability or, more broadly speaking, security in a nuclear-armed neighborhood. What follows is a brief overview of some possible options for external power involvement, along with some preliminary thoughts on how likely it is that these options would be exercised.

If the objective is to preserve crisis stability in a multipolar nuclear-armed Middle East, one initial step that might be taken is making arrangements to share early warning data that a nuclear attack is underway. For this to be possible the threatened state(s) would have to have an indigenous command-and-control system that can make use of such data, and a high level of trust with the provider. In the case of the former, even prompt attack warning in the event of an incoming ballistic missile strike would only provide a few minutes' warning of the impending attack. Given the highly compressed timelines involved in providing the warning, deciding upon a course of action, and communicating that course of action to the target state's nuclear forces, a robust and highly effective command and control system (to include highly trained individuals operating it) would appear to be a prerequisite for any state to make use of nuclear attack warning.[150] Since such an arrangement presumes a high level of trust between the regional nuclear power and the provider, it is difficult to imagine Iran or Syria signing up for this kind of support from the United States or its allies.[151] Over time, perhaps, China or Russia might make such an offer. Enhanced stability would then be dependent upon the perceived reliability and effectiveness of these countries' early warning systems.

Insurance against accidental and unauthorized launch of a nuclear attack may be provided in the form of permissive action links (PALs), and by cyber defenses to protect against electronic infiltration into a nuclear-armed state's nuclear command and control system. However, to the extent that these protective measures slow down the retaliatory launch sequence, their stabilizing effects may be offset somewhat by the improved odds an enemy might have of pulling off a successful first strike. Moreover, an extremely high level of trust between the recipient and the provider would be required, given that those same PALs could potentially disable the recipient's weapons without its knowledge.

As noted above, another prospective way of addressing the problem of vulnerable nuclear forces is to bring a state under the US nuclear umbrella. The prospect that

[150] In theory, the United States or other states could provide command and control systems. They might also assist in the training of personnel to operate the system.

[151] One also wonders if Arab states friendly toward the United States would trust that Washington would provide them with early attack warning in the event of an attack emanating from Israel.

any nuclear-armed Middle East state could eliminate, through a nuclear first strike, the United States' ability to retaliate with overwhelming nuclear force is microscopic. The same might be said of other major nuclear powers. The issue, as noted above, is the United States' willingness (or that of France or Great Britain, for example) to risk absorbing a countervalue attack[152] from even a few nuclear weapons.[153]

A variation on this theme might see the three great nuclear powers of the West institute a form of collective deterrence, with each pledging to retaliate with overwhelming force against any state that employs nuclear weapons against a non-nuclear state. A would-be nuclear aggressor in this instance would be confronted with discouraging multiple sources of retaliation, which could raise the level of deterrence—and crisis stability—significantly. Aside from the risks each nuclear guarantor might confront in undertaking such an enterprise, there is the matter of which state would draw the short straw and employ its nuclear weapons in the event collective deterrence failed and retaliation were required. In any event, the United States is on record as having provided "positive security assurances" to states that forego acquiring nuclear weapons.[154]

There is the matter of which state would draw the short straw and employ its nuclear weapons in the event collective deterrence failed.

Nuclear powers external to the region may have other motives for assisting Middle East nuclear powers or states aspiring to acquire a nuclear weapons capability. For example, access to key resources such as oil or natural gas could be a powerful motivating factor for some states. Others may seek economic assistance from energy-rich states in exchange for assistance on nuclear matters. Some nuclear powers might be looking for political leverage. For example, China or Russia may see the transfer of nuclear technology and capabilities to states in the region not only in economic terms, but also as a way of making the region a "base-free" zone for foreign powers, given the growing difficulties that would likely be associated with defending such bases in a high nuclear-threat environment. As the United States has by far the most military

---

[152] Countervalue targets are those associated with a country's population and industrial base, rather than its military forces, which are termed counterforce targets.

[153] While it may take some time for Middle East nuclear powers to field ballistic missiles capable of striking the United States with high confidence, more crude measures of delivering these weapons to their targets may prove highly effective. For example, there is the long-discussed problem of detecting a nuclear weapon in a cargo ship entering a major US port. As cruise missile technology proliferates, it may be relatively easy to strike a target along the US coast from a position several hundred miles out at sea—if one can fashion a warhead small enough to fit on it.

[154] The United States has given "positive security assurances" with respect to non-nuclear armed states that are victims of a nuclear attack. These assurances extend back over thirty years. On November 17, 1978 the United States declared it "will not use nuclear weapons against any non-nuclear-weapon State Party to the NPT or any comparable internationally binding commitment not to acquire nuclear explosive devices, except in the case of an attack on the United States, its territories or armed forces, or its allies, by such a State allied to a nuclear-weapon State or associated with a nuclear-weapon State in carrying out or sustaining the attack." In April 1995 the United States affirmed "its intention to provide or support immediate assistance, in accordance with the Charter, to any non-nuclear-weapon State Party to the Treaty on the Non-Proliferation of Nuclear Weapons that is a victim of an act of, or an object of a threat of, aggression in which nuclear weapons are used."

facilities of any external power in the region, this might prove effective in reducing American influence in the region.

Nuclear Warfighting

Once the United States and the Soviet Union acquired large nuclear arsenals during the Cold War, the idea that nuclear wars between the two could be fought to some form of resolution where there would be a "winner" and a "loser" was seen as highly implausible, and thinking about nuclear war-fighting diminished to the point where those in the West who did so were subject to ridicule. As early as the 1950s President Eisenhower concluded that "the only thing worse than losing a global [nuclear] war is winning one."[155] President Kennedy declared that in the event of a nuclear exchange, "the fruits of victory would be ashes in our mouth."[156] President Reagan, among the most hawkish of Cold War-era US presidents, stated that "a nuclear war cannot be won and must never be fought."[157]

Once the United States and the Soviet Union acquired large nuclear arsenals, thinking about nuclear war-fighting diminished to the point where those in the West who did so were subject to ridicule.

In a proliferated Middle East, such a war could be fought, and the world would likely live to confront the aftermath. States armed with a few score fission-based nuclear weapons could wreak unparalleled destruction throughout the region and perhaps beyond. But absent large numbers of thermonuclear weapons, humankind would confront the aftermath. If nuclear war-fighting is no longer an unthinkable proposition from a strategic perspective, how might the United States and allies such as France and Great Britain limit the damage? How could they impose a level of intra-war deterrence? How might they bring about an end to hostilities?

The answers to these questions are far beyond the scope of this brief narrative. The following observations (as is the case with many others presented here) are made in the spirit of stimulating discussion and analysis so as to better understand the potential consequences should Iran acquire a nuclear weapons capability.

Generally discarded halfway through the Cold War, especially by the United States, defenses may play an important role in preserving deterrence and terminating a conflict. The United States possesses advanced air and missile defense systems. If these systems are within range of nuclear-armed delivery systems, they could exert a major influence on the military balance during periods of crisis and war. In a crisis, the United States could, in theory, threaten to intercept the ballistic missiles of any state attempting a first strike. It may also be possible to intercept nuclear-capable aircraft and cruise missiles. In attempting to terminate a conflict, the United States could declare that its forces will intercept any ballistic missiles or nuclear-capable aircraft or cruise missiles launched by any power after a declared cease-fire goes into effect.

---

[155] Ronald R. Krebs, *Dueling Visions* (College Station, Tx: Texas A&M University Press, 2001), p. 59.

[156] John F. Kennedy, Address to the Nation, October 22, 1662, accessed at http://www.americanrhetoric.com/speeches/jfkcubanmissilecrisis.html, on February 20, 2009.

[157] Ronald W. Reagan, State of the Union Address, January 25, 1984, accessed at http://reagan2020.us/speeches/state_of_the_union_1984.asp, on February 20. 2009.

Again, these are preliminary thoughts. Problems may abound in employing air and missile defenses. For one, US forces themselves may become targets of attack, perhaps even a nuclear attack. Would an American administration risk war with a nuclear power under these circumstances? A nuclear-armed state that enjoys a strong advantage in conventional forces over its nuclear-armed adversary may be advantaged by the United States' efforts to remove nuclear weapons from the conflict. Would such an "intercept" policy actually encourage conflict? If the conflict began with a conventional phase, how could the United States be certain that strike aircraft were carrying conventional munitions, and not nuclear weapons? It may be that an intercept policy increases the risk of a "bolt-from-the-blue" attack, as a nuclear-armed state could decide that its best option would be to launch a nuclear attack unexpectedly, before US forces can be brought to bear. Again, this would have the effect of reducing stability.

If the initial stages of a war between two or more nuclear-armed Middle East states did not involve the use of nuclear weapons, the United States could also threaten to disarm a state of its nuclear weapons by striking them before they could be launched, should launch preparations be identified as being under way. Yet this approach seems to suffer from many of the problems associated with employing missile defenses to whittle down the arsenal of a nuclear-armed aggressor. There is also the matter of determining who is launching a nuclear attack. Would the United States be confident that it could definitively identify the source of a nuclear-armed ballistic missile launched from along the Iranian-Pakistani border? Or that preparations for missile strikes under way along the Iranian-Pakistani border could be clearly identified as the actions of one state and not the other? What about a nuclear weapon aboard a transport ship that is detonated as the ship comes into port?

Would the United States be confident that it could definitively identify the source of a nuclear-armed ballistic missile launched from along the Iranian-Pakistani border?

Finally, as in many of the other cases, the issue of Israel comes to the fore. Given its lack of strategic depth, Israel may feel compelled to strike quickly in the event of a conflict in the belief that it could not sustain even a few nuclear detonations on its soil. Would the United States look to intercept an Israeli attack under these circumstances? Destroy Israel's nuclear arsenal? It seems highly unlikely.

To avoid having US forces arrive on the scene too late to influence the calculations of a state (or states) contemplating the first use of nuclear weapons, American forces may need to be forward-based. This, however, also has its drawbacks. Washington could find states increasingly reluctant to permit US forces to base in their country, or even to make regular port visits or conduct combined exercises, lest they become potential targets of attack. Were US forces to base forward, they could be at high risk of being targeted in an aggressor's initial nuclear strikes in order to reduce or even eliminate their ability to stabilize a crisis or create intra-war deterrence. If forward bases are unavailable or access is problematic, the United States would likely need to increase its reliance on long-range systems and maritime forces.

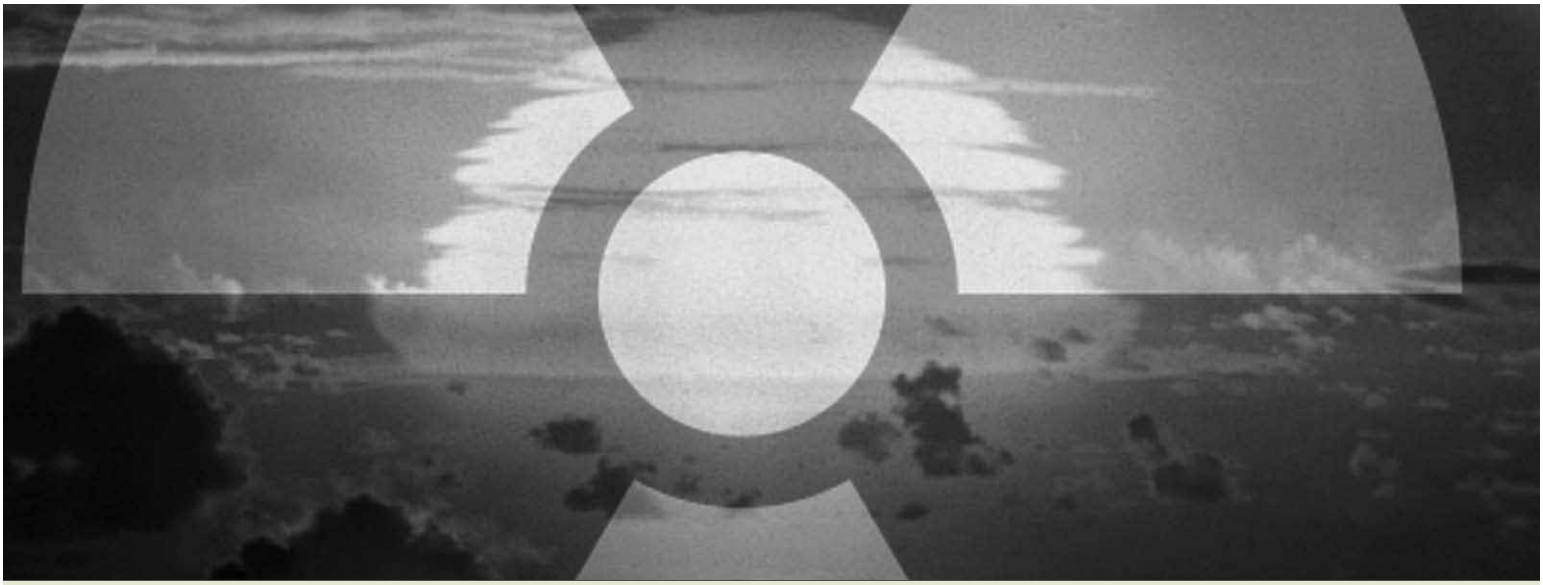
There are other factors relating to war termination, too numerous to be addressed here.[158] However, one does bear mentioning. It may be that, following even a modest nuclear exchange of a dozen weapons or so, the belligerents are so horrified by what they have wrought that the prospect of continuing the conflict is unacceptable. If so, they will still have to find some way of communicating this fact to one another. If the United States retains effective communications with the warring governments, and if they are willing to accept the United States as an honest broker, Washington could be a key factor in bringing about a cessation of hostilities.

Finally, the war could be ended if the United States threatened to enter the conflict on one side or another (or, potentially, against all belligerents) if the warring parties failed to accept a cease fire. As with most of the other war termination options, this approach has significant potential shortcomings. It could trigger an intervention by another nuclear power, raising the specter of a wider war, rather than bring about the end of a war. This calls to mind the First World War, which began as a localized conflict in the Balkans that quickly spun out of control as the great powers became engaged, one right after the other. It may be that the quickest way to end such a war would be for the United States and its allies to use nuclear weapons themselves. Such an action would have profound moral and practical consequences.

Once a limited nuclear war ends, the United States and other leading members of the international community could find themselves engaged in large-scale remediation efforts, humanitarian relief operations, disarmament operations (e.g., confiscating residual nuclear arsenals, other WMD, nuclear weapon delivery systems, etc) and stability operations, to include reconstruction. Success in these efforts could help improve the United States' standing in the region and beyond, and perhaps help restore the tradition of non-use of nuclear weapons.

---

[158] For an excellent study of war termination issues, see Fred Charles Iklé, *Every War Must End* (New York: Columbia University Press, 1971).



CONCLUSION AND RECOMMENDATIONS

US OBJECTIVES AND BASELINE STRATEGY

The fundamental purpose of any democratic government is to safeguard its citizens and ensure their well-being. To this end, preventing a nuclear attack on the US homeland or against key allies and partners must assume a high priority. Subordinate to this overall objective, the United States has pursued a strategy of preventing adversaries from acquiring or using weapons of mass destruction.[159] More broadly speaking, the principal national security objective is to prevent the use of nuclear weapons, either as means of aggression or coercion, against the United States or its allies. Other critical objectives are: to defeat a nuclear attack should deterrence fail or, failing that, to limit the damage to the United States or its allies while maintaining the capacity to respond promptly and effectively in the event of a nuclear attack, whatever its source.

According to the National Defense Strategy (NDS), non-military means will be employed to achieve these objectives. However, US strategy also relies upon deterring the use of nuclear weapons against the United States and its vital interests. Should deterrence fail, the United States will rely on active defenses against nuclear attack and improved consequence management capabilities to mitigate the damage suffered in a nuclear attack. Importantly, "the United States will, if necessary, act preemptively in exercising its right of self-defense to forestall or prevent hostile acts by [its] adversaries."[160]

In an increasingly proliferated world, the threat of nuclear attack may also emerge from the potential for severe instability in nuclear-armed states, which could result in the loss of control over these weapons. Consequently, the National Defense Strategy

---

[159] Secretary of Defense Robert M. Gates, *National Defense Strategy* (Washington, DC: Department of Defense, June 2008), p. 14.

[160] Ibid.

states that the United States must be prepared to detect, tag, track, intercept, and destroy nuclear weapons and related materials. Should the United States, its allies, or its partners be attacked by a minor power with nuclear weapons, the US military must be able to sustain operations, presumably oriented on arresting and, if necessary, destroying the source of the attacks.[161]

While the NDS does not elaborate on its nuclear strategy (the entire discussion runs less than two pages), the fundamental elements—dissuading states from acquiring nuclear weapons, deterring nuclear-armed states from using nuclear weapons, reassuring allies and partners under the US nuclear umbrella, and defending against and ultimately defeating acts of nuclear aggression—are consistent with longstanding US policy, the strategy lacks specifics regarding capabilities. The remainder of this chapter provides some specific recommendations intended to ensure that the US nuclear posture is capable, to the extent possible, of executing this strategy.

Surveying this emerging nuclear regime, one is sobered by its complexity and the lack of mechanisms for imposing some form of stability.

NEEDED: A NEW STRATEGIC CONCEPT

If nothing else, this report seeks to raise awareness of the need for a fundamental rethinking of the underlying strategic logic developed during the Cold War with regard to nuclear weapons. The conditions that informed that logic have, in many respects, passed into history along with the Cold War itself. The number of nuclear-armed states has grown significantly, and more may be on the way. With US and Russian nuclear force reductions, the world may well be shifting from a bipolar nuclear world to a multipolar nuclear world, complete with regional arms races. With the fielding of long-range guided weapons in large numbers and the creation of cyber weapons following the rise of information-based economies, nuclear weapons are not the only means for inflicting prompt and devastating destruction on a broad scale. India and Pakistan, newly armed nuclear powers, lie at the heart of one of the most unstable regions on the globe. The prospect of a regional nuclear war between the two nations—or perhaps, before long, between Iran and Israel—cannot be discounted, no matter how much we would like to ignore it. An increase in the number of nuclear-armed states, some of them unstable, raises the prospect that nuclear weapons may fall into the hands of nonstate entities bent on causing catastrophic destruction. New forms of deterrence may be needed to prevent such attacks, if deterrence is possible at all. Finally, more nuclear powers means an increased risk of ambiguous nuclear aggression, presenting yet another problem that received little attention during the Cold War.

Surveying this emerging nuclear regime, one is sobered by its complexity and the lack of mechanisms for imposing some form of stability. In such an environment, it is easy to see why some statesmen—most notably the Four Horsemen—seek salva-

[161] Ibid., pp. 13, 15. More broadly speaking, the NDS states that the United States "must maintain the capabilities required to defeat state adversaries, including those armed with nuclear weapons."

tion in pursuing a world without nuclear weapons. Yet, as Chapter 3 concludes, such a world is not only highly implausible, it may actually be undesirable.

Where does that leave us? We would do well to take a lesson from our Cold War-era predecessors, a succession of administrations that took a realistic view of what arms control might accomplish, while at the same time devoting great intellectual effort—especially in the early years of the nuclear age—to developing strategies for addressing the challenges of the world they lived in. This report represents only a first step, at best, at raising some of the issues the United States confronts in the world in which it now finds itself. Consequently, pending a thorough examination of the issues raised in the preceding chapters, similar to the efforts of the Truman and Eisenhower administrations in the early 1950s, the recommendations that follow are modest. Their purpose is to keep the United States' nuclear options open until such a review is completed and a well-crafted strategy is in place.

PREVENTING PROLIFERATION

It is in the United States' interest to prevent the spread of nuclear weapons and nuclear weapons-related technology. To this end, building and expanding global counterproliferation partnerships, strengthening NPT compliance and enforcement regimes, and improving human intelligence dedicated to counter-proliferation should be accorded high priority.

Consistent with US strategy, efforts to preventing the proliferation of nuclear weapons are needed in three broad areas: securing weapons-grade fissile material; fielding capabilities that enable global surveillance, detection, and interdiction of nuclear materials; and preparing for a range of nuclear weapons elimination operations, to include preventive action options, should they become necessary.

Securing Weapons-Grade Fissile Material

President Obama has declared his intent to sponsor a range of initiatives designed to secure weapons-grade fissile material. They include seeking a "new treaty that verifiably ends the production of fissile materials intended for use in state nuclear weapons.... a new framework for civil nuclear cooperation, including an international fuel bank, so that countries can access peaceful power without increasing the risks of proliferation.... [and] a new international effort to secure all vulnerable nuclear material around the world within four years." Carefully negotiated, such agreements can provide significant safeguards against the spread of nuclear weapons. The president also reaffirmed the United States' support for other programs designed to block the spread of weapons-grade nuclear materials, reaffirming US support for ongoing ef-

forts such as the Proliferation Security Initiative and the Global Initiative to Combat Nuclear Terrorism.[162]

The United States can also assist friendly governments of new nuclear-armed states in improving their controls over their nuclear weapons, fissionable materials, and weapons production infrastructure. For example, assuming the suspicions of other states can be allayed, technology such as that embedded in permissive action links (PALs) designed to prevent the arming or detonation of a nuclear warhead absent authorization from a nation's nuclear command authority might usefully be shared.[163]

Enhancing Global Surveillance, Detection, and Interdiction

One way of enhancing the prospects for securing weapons-grade fissile material is to discourage cheating on agreements designed to block the transfer of such materials. Of course, should agreements like those proposed by the Obama Administration fail to materialize, capabilities that enhance the United States' ability to detect, intercept and secure both weapons-grade fissile material (and even nuclear weapons themselves) could prove invaluable in enforcing existing control agreements, intercepting nonstate entities armed with so-called dirty bombs or nuclear weapons, and recovering "loose nukes" that arise in the event a nuclear-armed state descends into chaos.

Capabilities that could assist in intelligence gathering include: enhanced human intelligence (HUMINT), especially with regard to nonstate groups such as al Qaeda; and remote surveillance capabilities such as unmanned aerial vehicles (UAVs) and satellites capable of providing imagery and signals intelligence (IMINT and SIGINT, respectively), as well as MASINT.[164] While nuclear weapons detection is greatly limited by the laws of physics, improving the US military's ability to detect nuclear weapons' signatures could prove important in confirming the presence of nuclear-weapons materials or the weapons themselves.[165]

Once the presence of nuclear weapons is confirmed, military options must be available to neutralize or destroy them. Priority should be given to improving white and

---

[162] "Obama Prague Speech on Nuclear Weapons," accessed at http://www.huffingtonpost.com/2009/04/05/obama-prague-speech-on-nu_n_183219.html, on April 9, 2009.

[163] For a discussion of PALs, see Ross Anderson, *Security Engineering* (Hoboken, NJ: Wiley, 2001), pp. 231-36.

[164] According to the Permanent Select Committee, Intelligence, House of Representatives, Measurement and Signature Intelligence is technically derived intelligence (excluding traditional imagery and signal intelligence) which when collected, processed, and analyzed, results in intelligence that detects, tracks, identifies, or describes the signatures (distinctive characteristics) of fixed or dynamic target sources. MASINT includes the advanced processing and exploitation of data derived from IMINT and SIGINT collection sources. MASINT sensors include, but are not limited to, radar, optical, infrared, acoustic, nuclear, radiation detection, and seismic systems as well as gas, liquid, and solid material sampling systems. Permanent Select Committee, Intelligence, House of Representatives, "IC21: The Intelligence Community in the 21st Century," June 5, 1996, accessed at http://www.gpo.gov/congress/house/intel/ic21/ic21007.html, on April 11, 2009.

[165] For an overview of the challenges associated with detecting nuclear weapon emissions, and some possible ways of improving detection capabilities, see Montgomery, *Nuclear Terrorism: Assessing the Threat, Developing a Response*, pp. 76-82.

black Special Operations Forces' (SOF) capabilities to conduct targeted raids, either to intercept "loose" nuclear weapons, or as part of preventive action operations against a hostile state.[166] These operations should also include personnel trained and equipped to disarm or disable those nuclear weapons that are recovered.

More broadly speaking, the United States must develop the full range of defenses against nuclear attack, to include attacks by traditional means (e.g., ballistic missiles, aircraft, and cruise missiles) and nontraditional means (e.g., covert insertion). Such defenses can be useful in addressing the threats posed by both ambiguous and overt forms of nuclear aggression.

DETERRING AND DEFEATING AMBIGUOUS NUCLEAR AGGRESSION

As noted earlier in this report, with increased proliferation comes an increased risk of ambiguous acts of nuclear aggression. One way to deter such acts, or to identify the source of the attack should one occur, is through improvements in US nuclear forensics. While sampling debris from a nuclear explosion could provide clues as to its origins, a major step forward in nuclear forensics would involve the creation of a global nuclear reactor data bank. Such a bank would contain fissile material samples from every nuclear reactor in the world—a nuclear fingerprint of sorts. Assuming the samples are valid (i.e. no false samples are provided), they could be used in the wake of an ambiguous nuclear attack to identify the reactor that provided the bomb's fissile materials and, by extension, point a finger at the perpetrator.[167]

The United States must develop the full range of defenses against nuclear attack, to include attacks by traditional means and nontraditional means.

Should deterrence fail and a limited attack occur, the United States must be able to mitigate the consequences of a limited nuclear attack on itself or its allies in such a manner as to maintain freedom of action to preserve collective interests at home and abroad. Faced by the potential catastrophic threat of a limited nuclear attack, the United States must pursue two tracks of emergency preparedness: prevention, and response and recovery. As noted above, the former depends greatly on intelligence gathering, especially human intelligence, as well as overt and covert actions designed to disrupt enemy efforts to acquire and employ nuclear weapons. The latter requires a unified national effort for response and recovery operations. The first step toward this end is the National Response Framework,[168] which outlines the basic strategy

---

[166] For a detailed set of recommendations pertaining to SOF capabilities as they relate to the missions described here, see Montgomery, *Nuclear Terrorism: Assessing the Threat, Developing a Response*, pp. 84-87. See also Robert Martinage, *Special Operations Forces: Future Challenges and Opportunities* (Washington, DC: Center for Strategic and Budgetary Assessments, 2008), pp. 37-38.

[167] Montgomery, *Nuclear Terrorism: Assessing the Threat, Developing a Response*, pp. 88-90. See also Krepinevich, *Seven Deadly Scenarios*, pp. 69-71; and William Dunlop and Harold Smith, "Who Did It? Using International Forensics to Detect and Deter Nuclear Terrorism," *Arms Control Today,* October 2006.

[168] Department of Homeland Security (DHS), *National Response Framework* (Washington, DC: DHS, January 2008).

and national, state, and local governmental structures needed to enable a national response to a nuclear attack on the United States. National training and exercises will be needed to test, coordinate, and hone all aspects and levels of the nation's response plans and organizations, and to determine the best role for both the active US armed forces and the National Guard and Reserves.

Fielding a consequence management capability in the event of a nuclear attack on the United States may have broader utility. Some capabilities may enable the United States to provide significant disaster relief to third-party countries following a nuclear exchange.

DETERRING OVERT NUCLEAR AGGRESSION

As the United States and Soviet Union reached the point during the Cold War where each had deployed thousands of nuclear weapons, thinking about how a nuclear war would be fought, as opposed to deterred, became an exercise in futility. This remains the case when significant nuclear powers are concerned.[169] Because of the size of their arsenals, US strategy against rival states must continue to emphasize deterrence. This requires maintaining robust nuclear forces capable of annihilating any adversary *or set of adversaries* after absorbing a surprise attack on the United States and/or its allies.

1,500 warheads seems an absolute floor for the time being.

Given the nontrivial possibility that the United States will find itself in a multipolar nuclear world comprising a number of significant non-allied nuclear powers, the size and form of the US nuclear deterrent cannot be solely a function of Russia's, as was effectively the case during the Cold War. Simply stated, the United States must account for significant nuclear threats other than Russia. Some modest reductions in nuclear force levels below the 1,700 minimum called for in the Strategic Offensive Reductions Treaty may be warranted. However, the greater the reductions, the lower the barrier becomes for other prospective rivals to join the United States and Russia as major nuclear powers. Given these considerations, 1,500 warheads seems an absolute floor for the time being. Any future reductions should be tied to commitments from other significant nuclear powers to limit the size of their nuclear arsenals. Failure to achieve such a commitment could risk triggering a multi-polar nuclear arms race—the opposite of what SORT and the Obama Administration hope to accomplish.

---

[169] For our purposes, significant nuclear powers are defined as those whose arsenal comprises over 50 nuclear weapons with designs that are either second-generation fission weapons with advanced boosting options, or first-generation fission-fusion (thermonuclear) weapons. Aside from Russia and China, France and Great Britain clearly fall within this category, and Israel may as well. Both India and Pakistan meet these criteria as well.

NUCLEAR ELIMINATION OPERATIONS

As noted in Chapters 3 and 4, the prospect of a more proliferated world characterized by a number of minor nuclear powers cannot be discounted.[170] In such a world, use of nuclear weapons could occur in which the consequences would not be catastrophic for the United States or any ally. This raises the prospect that the United States may need to engage in nuclear weapons elimination operations to prevent the use of such weapons — or their further use. Having said that, primary emphasis should remain on deterring nuclear use through the threat of overwhelming and devastating retaliation (deterrence through punishment) and the use of active and passive defenses (deterrence through denial).

In the event deterrence fails, the United States should develop capabilities that broaden its options beyond a counter-value nuclear counter strike or damage limitation efforts. Assuming the enemy has retained some portion of its nuclear arsenal, and that a cessation of hostilities is not possible, nuclear elimination operations may be necessary to avoid absorbing another enemy nuclear strike or engaging in nuclear counterforce retaliatory strikes. The United States must have the capability to respond promptly and devastatingly through nonnuclear means (e.g., guided weapons and cyber strikes), to include the ability to effect regime change in minor nuclear powers. To this end, the United States should enhance its capabilities for conducting highly distributed, highly integrated power-projection operations from stand-off ranges (i.e., absent the use of fixed forward bases) under conditions of radioactive contamination, or against an enemy who retains the ability to threaten nuclear attack.

Given the inherent difficulties in conducting these operations and the need to suppress enemy nuclear forces quickly to preclude further use, emphasis should also be placed on extended-range precision-strike operations designed to eliminate enemy weapons, delivery systems and, if need be, command and control links. Although preserving the international community's tradition of non-use of nuclear weapons should be accorded high priority, the United States must be prepared, *in extremis*, to employ nuclear weapons if they are deemed necessary to prevent further nuclear attacks by the enemy. If nuclear use is required, it should be done as discriminately as possible. This implies maintaining a capability to design and test nuclear weapons capable of meeting this requirement.

The United States must be prepared, *in extremis*, to employ nuclear weapons if they are deemed necessary to prevent further nuclear attacks by the enemy.

CONCLUSION

The proliferated world that President Kennedy feared, one of "10 nuclear powers instead of four," a situation that would present "the greatest possible danger and haz-

[170] Minor nuclear powers are those whose arsenals are limited to small numbers (a few dozen at most) first-generation fission weapons.

ard"[171] seems closer than ever. Where there were four nuclear-armed states in the early 1960s, now there are double that number (with the addition of China, Israel, India, and Pakistan). And the number may reach ten (North Korea and Iran) or more before long. As Kennedy realized, such a world would likely be a less stable and more dangerous world than even that which existed only months after the Cuban Missile Crisis.

The best prospect for a world without nuclear weapons is a world in which the causes of human conflict — pride, envy and greed, among them — have been tamed or eliminated.

This report concludes that seeking refuge from this possibility by making the pursuit of a world without nuclear weapons the central theme of US nuclear policy and strategy is not practical. Moreover, serious doubts exist that a nuclear-free world will produce the results its advocates claim. As Robert Oppenheimer noted, "Fundamentally, and in the long run, the problem which is posed by the release of atomic energy is a problem of the ability of the human race to govern itself without war."[172] Thus the best prospect for a world without nuclear weapons is a world in which the causes of human conflict — pride, envy and greed, among them — have been tamed or eliminated. The alternative is a world government which possesses a monopoly of the powers of coercion and which may or may not embody the values Americans hold dear.

Consequently, this report also concludes that while the United States should continue to accord high priority to arresting nuclear proliferation and reversing it where possible, it must craft strategies for the world it will likely inhabit for the indefinite future: a world of eight or more nuclear-armed states — some of which are unstable, have ties to radical nonstate groups, or both — with the prospect of more to follow.

---

[171] President John F. Kennedy, Press Conference, State Department Auditorium, Washington, D.C. March 21, 1963, Cited at http://www.jfklibrary.org/Historical+Resources/Archives/Reference+Desk/Press+Conferences/003POF05Pressconference52_03211963.htm, accessed on January 3, 2009.

[172] Cited in Rhodes, *Dark Sun: The Making of the Hydrogen Bomb*, p. 588.

GLOSSARY

ABM	Antiballistic Missile Treaty
A.Q. Khan	Abdul Qadeer Khan, "father" of the Pakistani bomb
CTBT	Comprehensive Test Ban Treaty
DEW	Directed-energy weapons
DPRK	Democratic People's Republic of Korea (North Korea)
EMP	Electromagnetic pulse
ERW	Enhanced radiation warhead
HEU	Highly enriched uranium
HUMINT	Human intelligence
IAEA	International Atomic Energy Agency
IMINT	Imagery intelligence
INF	Intermediate Range Nuclear Forces Treaty
LEP	Life Extension Program
MARV	Maneuverable reentry vehicle
MASINT	Measurement and signals intelligence
MIRV	Multiple independently targetable reentry vehicles
NATO	North Atlantic Treaty Organization
NDS	National Defense Strategy
NNSA	National Nuclear Security Administration
NPT	Non-Proliferation Treaty (1968 Treaty on the Non-Proliferation of Nuclear Weapons)
NSG	Nuclear Suppliers Group
PALs	Permissive action links
PGM	Precision-guided munition
PSI	Proliferation Security Initiative
RRW	Reliable replacement warhead
SALT	Strategic Arms Limitation Treaty
SDI	Strategic Defense Initiative
SIGINT	Signals intelligence

SOF	Special Operations Forces
SORT	Strategic Offensive Reductions Treaty
SSP	Stockpile Stewardship Program
START	Strategic Arms Reduction Treaty
UAE	United Arab Emirates
UAV	Unmanned aerial vehicle
WMD	Weapons of mass destruction

Acknowledgments

The author would like to thank the CSBA staff for their assistance with this report. The author would also like to thank Evan Montgomery, Jim Thomas and Barry Watts for sharing their time generously in providing comments and insights on draft versions of this report. Special thanks go to Charlotte Brock, Eric Lindsey and Oakland Street Publishing for their editorial and production support.

The analysis and findings presented here are solely the responsibility of the Center for Strategic and Budgetary Assessments and the author.

Center for Strategic and Budgetary Assessments
1667 K Street, NW, Suite 900
Washington, DC 20006
Tel. 202-331-7990 · Fax 202-331-8019
www.CSBAonline.org