

# Planning the Future U.S. Nuclear Force

Volume I: Executive Report

October 2009



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## Table of Contents

|   |    |
|---|----|
| I. Introduction .....   | 1  |
| II. Some Lessons From the Past.....                                       | 2  |
| Multiple Roles of Nuclear Weapons .....                                   | 3  |
| Unacceptability of Nuclear Inferiority.....                               | 4  |
| Inadequacy of Minimum Deterrence .....                                    | 4  |
| Advantages of a Nuclear Triad .....                                       | 5  |
| III. Extended Deterrence and the Assurance of Allies.....                 | 6  |
| Effects on Nuclear Plans and Forces.....                                  | 6  |
| Contemporary Challenges .....   | 7  |
| Allied Views .....  | 8  |
| Some Implications.....  | 9  |
| Non-Proliferation Benefit.....  | 10 |
| IV. Nuclear Force Planning With a Strategic Perspective .....             | 10 |
| Deterrence .....  | 11 |
| Damage Limitation .....   | 13 |
| Dissuasion .....  | 14 |
| Goal-Related Force Requirements .....                                     | 15 |
| Need for Resilience.....  | 16 |
| Resilience and Force Reductions .....                                     | 17 |
| Additional Means for Mitigating the Risks of Nuclear Reductions .....     | 19 |
| Future Force Modernization .....  | 21 |
| V. A Note on Nuclear Elimination.....                                     | 21 |
| U.S. Pursuit of Elimination Can Increase Proliferation.....               | 22 |
| U.S. Conventional Superiority Creates Nuclear Incentives for Others ..... | 22 |
| Verification and Enforcement Dilemmas Impede Elimination.....             | 23 |
| Elimination Depends on the Unlikely Transformation of the World Order ... | 23 |
| VI. Conclusions.....  | 24 |
| Notes .....   | 26 |
| About the Contributors .....  | 33 |
| About the Reviewers.....  | 37 |



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## Executive Report

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### I. Introduction

“Public interest in our strategic posture has faded over the decades,” former Defense Secretary James Schlesinger has observed. “In the Cold War, it was a most prominent subject. Now, much of the public is barely interested in it. And that has been true of the Congress as well.”<sup>1</sup> This situation is likely to change, however, as several developments in the coming months and years return to prominence issues concerning the future of U.S. nuclear forces and the dangers from the nuclear weapons of others. President Obama and his Russian counterpart have announced the framework for an arms reduction agreement to replace the 1991 Strategic Arms Reduction Treaty (START), which expires in December 2009. The new agreement will be the subject of Senate and public debate. The president, along with a number of former top officials, world leaders, and advocacy groups, also has urged redoubled efforts to eliminate nuclear weapons altogether. This “zero” proposal already has caused controversy. In addition to these arms control initiatives, a congressionally mandated Nuclear Posture Review (NPR) is under way in the Defense Department and scheduled for completion by the end of 2009. NPR findings concerning U.S. nuclear weapons policy, strategy, and force structure undoubtedly will be matters of interest and contention both at home and abroad. In particular, key allies may look to the review for new measures to reinforce the commitment of U.S. nuclear forces to their defense. Allied anxieties have been aroused by the nuclear weapons programs of North Korea and Iran, the nuclear force modernization activities of Russia and China, and the various threats made by these countries. The North Korean and Iranian programs also have highlighted the increasing danger of nuclear proliferation. That danger and possible remedies will be topics for the May 2010 international conference to review the nuclear Non-Proliferation Treaty (NPT). In short, the press of near-term events will compel greater attention to nuclear weapons-related issues.

One important set of issues concerns the purposes and qualities of the U.S. nuclear force best suited to contemporary security conditions. These are questions of force planning that bear directly on U.S. arms control, alliance, and non-proliferation policies. Given the potentially grave consequences of error, careful analysis should inform discussion and decisions concerning the future of the nuclear force. Yet, too often contributions to the debate simply are assertions that a certain number of nuclear warheads is adequate for deterrence. The number specified—1,500, 1,000, 500, 100—typically is lower than the existing level. Few, if any, analytic underpinnings are provided to support the preferred figure. Such emphasis on the total number of deployed warheads is misplaced for a number of reasons. First, it implies a false precision for an inherently uncertain and untidy enterprise. The threat posed by a specific number of warheads against a particular set of targets, for example, is unlikely to have highly

predictable deterrent effects on would-be aggressors, particularly in varied circumstances. Second, it neglects the many complexities involved in force design. Among other things, focus on the warhead total slight other critical attributes of the nuclear force, including the delivery vehicles (missiles and aircraft) that carry those warheads, the ways in which the delivery vehicles are deployed, the distribution of warheads among vehicles, the readiness of different force elements, the prospective interactions between the force and enemy offensive and defensive counters, and even the characteristics of the warheads themselves (deployed or non-deployed status, performance reliability, explosive yield, fuzing options, and lethality against specified targets). Third, and perhaps most important, the merit of any warhead number—and overall force—cannot be assessed without detailed examination of how well the proposed capability serves not only deterrence, but also the additional pertinent objectives of the United States and its allies. Though the process is arduous, inexact, and influenced by judgment calls, the size and composition of the nuclear force should be derived in a logical and readily apparent manner from the national security requirements of the United States and its allies, not determined simply by intuition, targeting formula, or the next lower round number of warheads in an arms control process.

How then should executive branch officials, members of Congress and their staffs, journalists and commentators, and interested citizens think about the nuclear force needed by the United States for the security challenges of the next decade or two? One approach is outlined in sections that follow.

## **II. Some Lessons From the Past**

Looking to the past can be a guide to the future. The history of the last 60 years reveals a number of fundamental continuities in U.S. goals, nuclear weapons policy, strategy, plans and forces that extend across major changes in international politics and 10 changes in presidential administrations. These continuities stem from enduring factors that create imperatives and constrain choices in shaping the U.S. nuclear posture (the combination of nuclear plans, forces, deployments, and readiness). These factors include the essential nature of nuclear weapons, the persistence of certain types of threats, the long-standing commitments of the United States to the security of allies, the limitations of non-nuclear capabilities as substitutes for nuclear weapons, the generally incremental change in organizations and personnel with nuclear responsibilities, and the reluctance of officials to make radical changes in the nuclear posture.

Listed below are several continuities in the nuclear-related positions taken by past presidential administrations. They are distilled from a large number of presidential directives and other statements, memoirs, interviews, official histories, government reports, congressional hearings, and secondary sources.<sup>2</sup> While there are others, these are among the continuities of basic importance. Each continuity is stated as a clear-cut proposition that, based on the evidence, is consistent with the views of most or all previous administrations. Together they represent a consensus of sorts on some central



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nuclear issues. This consensus, it is worth noting, has not been contrived by a think tank or task force, but forged in the hard experience of different administrations, both Republican and Democratic, struggling with the difficult problems posed by nuclear weapons, both during and after the Cold War. The continuities are as follows:

1. Nuclear arms are special weapons and not just more powerful versions of high-explosive munitions.
2. The safety, security, and authorized control of nuclear weapons are essential.
3. Military alternatives to nuclear weapons, where possible, are preferred.
4. The roles for nuclear weapons go beyond the deterrence of nuclear use.
5. The threat of nuclear retaliation, not defenses, provides the primary protection against nuclear attack.
6. Nuclear forces must not be inferior to those of another power.
7. Nuclear forces support security commitments to defend key allies.
8. The option to use nuclear weapons first should be retained.
9. A minimum deterrence force is inadequate to meet defense requirements.
10. A triad of strategic nuclear forces is valuable for its resilience, survivability, and flexibility.

Of these continuities, five (4, 6, 7, 9, and 10) have special significance for the types, numbers, and deployments of nuclear weapons and delivery vehicles needed by the United States, as well as the roles nuclear forces play.

### ***Multiple Roles of Nuclear Weapons***

U.S. nuclear forces always have served purposes in addition to preventing nuclear intimidation or attack (Continuity 4). Presidents have considered nuclear use or made nuclear threats to reinforce crisis diplomacy, deter or defeat large-scale conventional aggression, counter chemical or biological attacks, and hold at risk priority targets (hard and deeply buried command bunkers, for example) for which conventional strike capabilities are ill-suited. U.S. policy has never been to restrict the ambit of nuclear weapons to the deterrence of nuclear use. Although in recent conflicts the United States has enjoyed conventional superiority, obviating any need to reinforce general-purpose capabilities with nuclear arms, this was not always true in the past and might not be true in future contingencies where an adversary may hold a significant edge in conventional military power, even if that advantage were only local (confined to a specific region) or

temporary (evaporating with the eventual arrival of additional U.S. expeditionary forces). Because past administrations have seen nuclear weapons as helping to check non-nuclear aggression against U.S. allies and forward-deployed forces, the capabilities of, and attack options for, U.S. nuclear forces have gone beyond those necessary for deterring only nuclear strikes against the United States itself.

### ***Unacceptability of Nuclear Inferiority***

The principle that the United States must avoid apparent nuclear inferiority (Continuity 6) clearly has implications for force sizing. Denying opponents nuclear superiority appears to matter, even if many believe the catastrophic nature of nuclear war argues otherwise. Political leaders and the public may accept not being ahead, but are loath to fall manifestly behind. While administrations have used a variety of quantitative and qualitative formulations to define the nuclear position required for the United States (including “superiority,” “parity,” “equivalence,” and “second to none”), all past presidents have called for at least parity with the nearest nuclear rival. They have taken the view that the United States must either have a nuclear advantage itself or deny such an advantage to its competitors. The aversion to inferiority reflects at least three concerns: apprehension by presidents and their advisers that an unfavorable nuclear imbalance could encourage aggression by an opponent, even if the limits of superiority were apparent to U.S. officials; unease that allies might be unsettled by such an imbalance and rendered less sure of U.S. leadership; and worry that ceding an advantage to an adversary could have adverse repercussions not only in foreign capitals, but also in the domestic political realm (recall the controversies over the “bomber gap,” “missile gap,” and “window of vulnerability”). The July 2009 Joint Understanding that requires the United States and Russia to reduce strategic nuclear weapons to a common level of 1,500-1,675 warheads under a post-START treaty is consistent with the principle of preserving parity and avoiding inferiority.<sup>3</sup>

### ***Inadequacy of Minimum Deterrence***

Previous administrations have never accepted “minimum deterrence” as a planning construct for the U.S. nuclear force (Continuity 9). Under the minimum deterrence concept, the retaliatory threat posed by no more than a few hundred nuclear warheads, carried by a small fleet of nuclear-powered ballistic missile submarines (SSBNs) or other highly survivable force, and targeted against an adversary’s urban-industrial centers, would be sufficient to meet U.S. security requirements. While proponents claim a minimum deterrence force would save money, prevent “overkill,” and slow the “arms race,” the concept repeatedly has been rejected by past administrations. Officials have judged such a posture inadequate because it would: violate moral and legal restrictions against deliberately targeting noncombatants; encourage attempts by lesser nuclear powers like China to match or surpass the United States; undermine nuclear commitments to allies; make the U.S. nuclear force more vulnerable to disarming attacks; offer few retaliatory options in the event of war; invite nuclear attacks on American cities in the wake of U.S. retaliatory strikes; and leave little, if any, offensive

capability for limiting damage to the United States and allies in wartime through strikes against enemy forces that had not yet been used. Instead of the minimum deterrence alternative, the United States has maintained a larger and more varied force suitable for a wider range of contingencies, including confrontations in which allies are endangered.

### ***Advantages of a Nuclear Triad***

For a half century, administrations have found value in a nuclear triad of intercontinental ballistic missiles (ICBMs), submarine-launched ballistic missiles (SLBMs), and long-range bombers (Continuity 10). The triad has consistently been valued for its four major advantages. First, each of the three “legs” has a useful and unique set of force characteristics. Notable attributes of the legs include the high survivability of SSBNs and short flight times of SLBMs, the variable-yield and earth-penetrating weapons of bombers, and the single-warhead payload of most ICBMs (which aids the planning of U.S. attack options) along with a large number of ICBM silos (which creates problems for an enemy planning a first strike). Second, weaknesses in one leg are offset by strengths in the others. For example, from the 1960s through the 1980s, the presence of ballistic missiles in the strategic force allowed pursuit of a long series of remedies for deficiencies in the bomber leg caused by Soviet air defense improvements. Third, the three legs in combination make an enemy attack on these forces especially difficult (as well as more costly to prepare for), thereby discouraging a first strike. A simultaneous attack on the entire strategic force is made a daunting task by the varied deployment modes of bombers, submarines, and ICBMs, and the three legs confront any prospective attacker with the threat of retaliatory strikes by multiple means, from various directions, and along different trajectories. Fourth, if deterrence breaks down, the varied capabilities of the triad enable a range of military responses, depending on the nature of the attack and the aims of the United States. Together these advantages provide the nuclear triad with survivability, flexibility, and resilience.

The nuclear triad today comprises 14 Trident SSBNs with D5 SLBMs, 450 silo-based Minuteman III ICBMs, and 76 B-52H and 20 B-2 bombers (B-1B bombers do not have a nuclear role). Each SSBN has 24 missile launch tubes, making the entire fleet capable of carrying a total of 336 SLBMs. Two SSBNs typically are in overhaul at any given time, however, reducing the SLBM total to 288. The B-52H and B-2 bombers are dual-capable for conventional as well as nuclear missions. The B-52Hs can be armed with nuclear air-launched cruise missiles (ALCMs), while the B-2 penetrating bombers can carry nuclear free-fall bombs. Only 44 B-52H and 16 B-2 bombers are available for combat; the other bombers are training, test, backup and attrition reserve aircraft.<sup>4</sup> The total number of strategic delivery vehicles (SLBMs, ICBMs, and bombers) is 882 or 798, depending on how the counting is done. For these delivery vehicles, there are somewhat more than 2,100 operationally deployed strategic nuclear warheads (ODSNWs).<sup>5</sup> This figure is roughly the same as the number of warheads carried by the strategic force in the late 1950s. The delivery vehicle total is similar to that of the early 1950s, although the only delivery vehicles at that time were bombers (intercontinental-range ballistic missiles and ballistic missile submarines had not yet been developed).<sup>6</sup>

In summary, the consensus of past administrations offers four traditional rules of thumb relevant to sizing and structuring the U.S. strategic nuclear force: the U.S. nuclear force does more than deter an opponent's nuclear use; anything less than nuclear parity is unacceptable; a minimum deterrence force is insufficient; and, a nuclear triad (or similarly diversified force) should be maintained. As noted earlier, one other continuity has significant implications for the kind of nuclear capabilities required by the United States: the role U.S. nuclear forces play in the security of key allies. This is the subject of the next section.

### **III. Extended Deterrence and the Assurance of Allies**

In one of his annual reports as secretary of defense, William Perry wrote, “[T]he United States has not only a national deterrent posture, but an international nuclear posture.”<sup>7</sup> Since the late 1940s, nuclear guarantees, extended deterrence, and assurance have been critical to the strategy, diplomacy, and forces related to the defense of U.S. allies. “Nuclear guarantees” are pledges that communicate the readiness of the United States to use nuclear forces to deter or defend against attacks on allies. These guarantees constitute a “nuclear umbrella” under which select countries are protected against aggression, whether nuclear, chemical, biological, or conventional. “Extended deterrence,” the deterrence of attacks against allies by means of U.S. nuclear retaliatory threats, is the intended effect of nuclear guarantees. “Assurance” is the purpose of measures designed to convince allies of the credibility of U.S. security commitments and the suitability of arrangements for mutual defense, particularly those involving nuclear forces.

Currently some 30 countries are covered by the U.S. nuclear umbrella. These include NATO allies, Japan, South Korea, and Australia.<sup>8</sup> Though most nuclear guarantees originated in the Cold War, they remain important in the current era. As international conditions change, additional countries in Europe (possible future NATO members) and the Middle East (friendly Arab states menaced by a nuclear Iran) might come under the umbrella.

#### ***Effects on Nuclear Plans and Forces***

The need to extend deterrence has been a major determinant of the characteristics of U.S. nuclear forces. Nuclear forces of the first rank are among the military advantages the United States brings to its alliances. One reason the last (2001) Nuclear Posture Review set a force level of 1,700-2,200 warheads (ODSNWs) was to maintain parity with Russia, the other leading nuclear state, and avoid an inferior U.S. position that allies might find troubling. The “second to none” nuclear standard that resulted from the 2001 NPR in fact was termed an “assurance-related requirement” by Defense Department officials.<sup>9</sup> Protection of allies also explains why U.S. nuclear weapons for decades were forward deployed in Asia and continue to be forward deployed in Europe. While the United States no longer has nuclear weapons on Asian soil, bombs for dual-capable F-

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15E and F-16 strike aircraft remain in some NATO countries.<sup>10</sup> In addition, a limited number of attack submarines can be outfitted with nuclear-armed Tomahawk land-attack missiles (TLAM-Ns) now kept in storage, and then deployed to locations near allies in Europe, Asia, or elsewhere.<sup>11</sup>

Along with force levels and force deployments, force employment plans have been affected by the requirements of extended deterrence and assurance. Over the years, the United States has incorporated into its war plans an increasing number of nuclear attack options that, by limiting the scope and scale of U.S. retaliation, are intended to bolster the credibility of deterrent threats made on behalf of allies.<sup>12</sup> These plans in turn have created requirements for certain nuclear force characteristics, including capabilities for striking sets (perhaps small sets) of military targets (including hard targets) with precision and control. (“Precision” and “control” are, of course, relative terms in the context of nuclear use.) Under past and present NATO strategy, options for limited attacks, and the aforementioned forward-deployed forces, represent “escalation linkages” that tie U.S. strategic nuclear forces to the defense of Europe, thereby reinforcing the deterrence of aggression. The aims of defending and assuring allies thus have real significance for the size, composition, other qualities, and potential use of U.S. nuclear forces.

### **Contemporary Challenges**

Today there are three challenges to extended deterrence and assurance. One involves increasing Russian aggressiveness, especially toward East European countries now aligned with the West, coupled with the growing role of nuclear weapons in Russian foreign policy and military strategy. The willingness of Russia to brandish its nuclear forces against former satellites is evident in its nuclear threats intended to discourage Poland and the Czech Republic, two of the newer members of NATO, from permitting U.S. missile defense sites on their territories. In contrast to their West European allies, the East European countries in NATO worry that they are at the edge of the nuclear umbrella, because of their closer proximity to Russia, their decades in Moscow’s orbit, their less well-established ties to the West, and their lack of NATO infrastructure and allied force deployments, including nuclear forces.

The proliferation of weapons of mass destruction (WMD) and their means of delivery pose the second challenge. North Korea’s two nuclear tests, in October 2006 and May 2009, as well as its more frequent missile tests, have caused grave anxiety in Japan and South Korea. Ongoing Chinese nuclear modernization adds to Japanese concerns. Iranian acquisition of nuclear-armed ballistic missiles could endanger U.S. allies in the Middle East and Europe. Future threats by Pyongyang, Tehran, or Beijing could test the credibility of U.S. nuclear guarantees. Allies already have raised questions about how the United States would respond if they were the targets of nuclear coercion or attack by these powers. The U.S. failure so far to roll back the North Korean and Iranian nuclear programs probably has fed doubts about the ability of the United States to fulfill its security commitments in East Asia and the Middle East.

The third challenge arises from the vulnerability of the United States itself to long-range nuclear threats. Nuclear threats to the U.S. homeland can undercut the credibility of U.S. nuclear guarantees and weaken bonds with allies. The intercontinental nuclear forces of Russia and China have been trained on the homeland for decades. Chinese nuclear forces are undergoing improvements that will increase the threats they pose. In the near future, North Korea and Iran also could deploy nuclear-armed ballistic missiles capable of reaching the United States. Adversaries could exploit this vulnerability to deter the United States from coming to the defense of friends and allies. As Chinese general Xiong Guangkai once instructed a former American diplomat regarding any future conflict over Taiwan, “In the 1950s, you three times threatened nuclear strikes on China [during the Korean war and the two Taiwan Strait crises], and you could do that because we couldn’t hit back. Now we can. So you are not going to threaten us again because, in the end, you care a lot more about Los Angeles than Taipei.”<sup>13</sup>

### ***Allied Views***

Determining what measures are necessary to assure allies of U.S. commitments in the face of these challenges will depend to a large extent on a careful understanding of allied views. Just as deterrence, including the extended variant, should be “tailored” to particular confrontations and particular opponents, so too should strategies of assurance be tailored to the distinct security requirements of the different allies under threat. In the end, it is the allies, not the United States, who decide if U.S. policies, plans, capabilities, and actions are sufficiently credible to provide their assurance.<sup>14</sup>

It appears that all allies want U.S. nuclear guarantees continued, if not strengthened. NATO countries collectively favor the continued deployment of “non-strategic” nuclear capabilities (the dual-capable strike aircraft and bombs in Europe). Comments by some U.S. officials regarding the possible withdrawal of non-strategic nuclear forces to foster better relations with Russia and to move toward the complete elimination of nuclear weapons have left some European allies uncertain about the long-term future of the extended deterrent. Questions about the modernization of non-strategic nuclear forces—for example, whether the United States will commit to developing a dual-capable version of the F-35 strike fighter—also have caused concern. Those in NATO nearer the Russian shadow—including the Poles and Czechs—have talked of the need for U.S. military facilities and personnel on their soil, participation in alliance nuclear planning, and perhaps deployment of dual-capable aircraft to local bases to ensure the protection afforded by the nuclear umbrella.

In Asia, South Korea sought reaffirmation of the U.S. nuclear guarantee in the wake of the North Korean nuclear tests; the United States obliged with public statements by ranking officials, including President George W. Bush and President Obama.<sup>15</sup> Seoul reportedly has asked for greater detail about U.S. nuclear plans for dealing with a range of possible aggressive acts by the North. In the event of war, the South Koreans expect Washington to provide “immediate support” and to act as if the United States itself had

been attacked.<sup>16</sup> Some former South Korean defense ministers have called for a return of U.S. nuclear weapons to the peninsula, weapons that were withdrawn in 1991 as part of a larger arms control initiative by President George H.W. Bush.

Nuclear developments in North Korea as well as in China similarly have created anxiety in Japan and drawn Japanese attention to the U.S. nuclear guarantee and the forces backing it. Japanese officials have expressed serious concern about the credibility of the U.S. extended deterrent. Some believe the United States must be cautious about further nuclear reductions lest they create an incentive for China to spur its own nuclear buildup in the hope of closing the gap with U.S. forces. Representatives of the Japanese government also have indicated that certain qualitative characteristics of U.S. nuclear forces are, in their view, important for deterrence and assurance. These include flexibility in the potential employment of nuclear capabilities, prompt delivery of weapons, and precision application of force, so that credible deterrent threats might be made for a range of contingencies.<sup>17</sup> The Japanese, moreover, value the ability of submarines with nuclear-armed cruise missiles (TLAM-Ns) or ballistic missiles (Trident D5s) to deploy to their region, exert a deterrent effect through forward presence, and yet not violate the decades-old prohibition against nuclear weapons on Japanese soil. One official has expressed the view that the United States could strengthen the extended deterrent during a period of heightened tension by announcing that an SSBN was being “deployed to the Western Pacific.”<sup>18</sup> The Japanese—like the South Koreans, Poles, and Czechs—would like greater insight into U.S. nuclear planning in light of the developing challenges to extended deterrence and assurance. Toward this end, Japanese and U.S. foreign and defense officials agreed in July 2009 to establish, according to a Ministry of Foreign Affairs statement, close consultations on “the Japan-US security alliance including nuclear deterrence.”<sup>19</sup>

### ***Some Implications***

Thorough, case-by-case, political-military analyses would be necessary to derive detailed nuclear force requirements from the broad goal of assuring allies confronted by the danger of major aggression. Nonetheless, some tentative generalizations can be made. Existing nuclear guarantees should be continued. The possibility of additional guarantees in the future cannot be ruled out. The United States should not be inferior to any nuclear rival (both for the purposes of assurance and for the reasons discussed in Section II). Current forward deployments of nuclear forces in Europe should be maintained. Forward deployments of nuclear-capable systems (e.g., submarines or strike aircraft) to Northeast Asia or East Europe may be options considered in the future. Because of the political sensitivities of allies as well as adversaries, the deployments might be temporary rather than permanent.

Regarding the adverse effect of homeland vulnerability on nuclear guarantees, a significant capability to limit damage from a nuclear attack could reduce the risk the United States would incur by coming to the aid of an embattled ally, thereby increasing the likelihood that the aggressor in a regional confrontation would be deterred and the

U.S. ally assured. Nevertheless, assurance is not simply a function of nuclear force configurations. For example, discussions to give the appropriate officials in Japan, South Korea, and the newer members of NATO a better understanding of the relationship between the security of their countries and the nuclear plans and capabilities of the United States would be one way of bolstering confidence in U.S. nuclear guarantees that does not involve force changes.

At bottom, assurance depends on the overall relationship between the United States and another party, whether a single country or a multinational alliance. The strength of the relationship and the U.S. stake in the security of the other party will be critical determinants of the trust that party places in the U.S. commitment, as well as how an adversary assesses the likelihood that the United States will honor its obligation *in extremis*. Assurance, and deterrence, are likely to be enhanced if the United States previously has deployed forces in a crisis, supplied military assistance, or otherwise acted to defend the other party; the track record is a demonstration of the U.S. commitment. And clear, repeated, and consistent public and private statements by ranking U.S. officials can underscore the commitment and lend credibility to security guarantees and deterrent threats; on the other hand, ambiguity may not assure allies and may embolden enemies.

#### ***Non-Proliferation Benefit***

The consequences of failing to maintain extended deterrence and the related assurance of allies should not be underestimated. If allies have less faith in, and adversaries less fear of, U.S. nuclear guarantees, not only could the risk of coercion and conflict increase, but the danger of nuclear proliferation could grow. Allies that no longer look to the United States for nuclear protection may seek their own nuclear alternatives instead. Conversely, there is considerable evidence that U.S. nuclear guarantees have kept a number of countries from acquiring nuclear weapons of their own. The list includes Germany, Norway, Turkey, Japan, South Korea, and Taiwan.<sup>20</sup> “The extension of a credible U.S. nuclear deterrent to allies and friends has been an important nonproliferation tool,” Walter Slocombe, a senior defense official in the Carter and Clinton administrations, has concluded. “Indeed, our strong security relationships probably have played as great a role in nonproliferation over the past 40 years as the NPT or any other single factor.”<sup>21</sup>

Although of fundamental importance, extended deterrence and assurance are only two of the many considerations that must be weighed in determining the required characteristics of U.S. nuclear forces. Other aspects of force planning are treated in the following section.

#### **IV. Nuclear Force Planning With a Strategic Perspective**

An approach to nuclear force planning that emerged during the Cold War involved setting deterrence as the sole or primary goal, positing a punitive threat (type and scale



of destruction) necessary to deter, calculating the number of warheads needed to inflict specified levels of damage against target sets related to that punitive threat, and designing nuclear forces able to survive a first strike and retaliate against the assigned targets. Contemporary claims that a specific, very low number of nuclear warheads will suffice for deterrence often reflect this Cold War approach.

Even in the Cold War, sizing the U.S. nuclear force in this manner was questionable. More doubts can be raised about its suitability now. Two problems were noted in the introductory section: the approach neglects the other purposes nuclear forces serve, including assurance; and, it assumes a predictable linkage between destructive potential and deterrent effect, something that may not be the case. Indeed, the factors that render deterrence unpredictable are heightened by the contemporary security environment.

### **Deterrence**

Consider the second problem first. The threat of nuclear escalation probably deterred conflict during the Cold War, although this cannot be known with certainty, even in retrospect. In future confrontations, an opponent might be compelled by overriding domestic or international imperatives, time pressures, and an absence of acceptable alternatives to wage war despite the grave risks presented by a U.S. nuclear deterrent threat. If Taiwan were to declare independence, for example, Chinese aggression against the island might be impossible to deter even through punitive nuclear threats. The success of U.S. deterrence in such a case certainly cannot be considered predictable. Reunification with Taiwan is an essential part of a nationalist agenda that supports the legitimacy of the Chinese regime. The use of force to quash an independence bid by Taiwan might seem unavoidable to the Chinese regime because of fears that loss of Taiwan could lead to the fall of other “dominoes” (notably the non-Han regions of Tibet, Xinjiang, and Inner Mongolia) and replacement of the current leadership in Beijing. Chinese general Zhu Chengdu thus has warned that in the event of U.S. military opposition in a war over Taiwan, China will be prepared “for the destruction of all the cities east of Xian” (the area with most of the population), and added, “Of course the Americans will have to be prepared that hundreds of cities will be destroyed by the Chinese.”<sup>22</sup>

Similarly, while punitive threats of physical destruction might have deterred the Marxist materialists who ruled from the Kremlin, other adversaries might place higher priority on intangible, transcendent values. They might be willing to take high-risk actions to defend or further those values. They also might believe they enjoy providential or supernatural protection. For example, Iranian president Mahmud Ahmadinejad is a believer in the imminent return of the Hidden Imam, or Mahdi, who disappeared in the 9<sup>th</sup> century and is prophesied to reappear, usher in a true Islamic government, and convert the world to Islam. Ahmadinejad has said that the policies of the Iranian government should be based on the Mahdi’s return. The Iranian president may even see himself as an agent of the Mahdi, able to prepare for, or perhaps hasten, his return.<sup>23</sup> The potential danger of

this millenarian view has been highlighted by Bernard Lewis, the distinguished historian of the Middle East: “In this context, mutual assured destruction, the deterrent that worked so well during the Cold War, would have no meaning. At the end of time, there will be general destruction anyway. What will matter will be the final destination of the dead—hell for the infidels, and heaven for the believers. For people of this mindset, MAD is not a constraint; it is an inducement.”<sup>24</sup>

This example also points to the possibility that lack of familiarity with the worldview and decision making of an opponent will impede design of effective deterrent threats. An answer to the question, “How much do you know?” about an opponent should precede any claim regarding “How much is enough?” to deter it. In the Cold War, the United States had decades of political-military interaction with the Soviet Union, which afforded the opportunity to get a better fix on the adversary and to refine strategies and capabilities for deterring aggression. The United States may not have this luxury for the full range of potential opponents that it now faces. As a consequence, there may be uncertainty about which elements of an opposing regime to threaten, with what punishment, by what means, and in what manner to communicate the deterrent threat reliably.

The present multiplicity of possible adversaries, conflicts, and threats significantly complicates the targets-and-warheads approach to deterrence. In the Cold War, nuclear force planning was dominated by the requirements for deterring one adversary, the Soviet Union, and two contingencies, a large-scale Warsaw Pact offensive that could escalate to intercontinental nuclear war and a (more improbable) Soviet “bolt out of the blue” (a surprise nuclear attack). The deterrence planning problems today are more varied and in some ways more complex. Conflict with the Russian Federation, successor to the Soviet Union, cannot be ruled out and other confrontations in which nuclear threats might come into play also are possible. How many warheads would be needed for a retaliatory threat aimed at deterring military action by Russia to secure “privileged interests” in its “border regions”?<sup>25</sup> Would the same threat deter various sorts of Russian intimidation directed against the East European members of NATO? What punitive threat would be necessary to deter a Chinese attack against Taiwan? Would a single retaliatory threat with a given number of warheads be sufficient to deter a North Korean invasion of the South, or salvo of conventional missiles against Japan, or nuclear-armed missile strike against the United States, or WMD attack against U.S. and South Korean forces moving on Pyongyang? Would the threat for deterring a non-nuclear Iran from acting against its neighbors be the same as the threat needed to deter a nuclear Iran? Are the requirements different for deterrence of attacks against Turkey and Israel? Are the warhead requirements for this spectrum of contingencies additive or does the warhead number for the most demanding contingency also cover the “lesser included cases”? Do all warhead types have the same deterrent value for all purposes? Simply asking these questions shows the error in reducing deterrence problems and related force planning to exercises in targeting analysis and warhead counting. No warhead number, whether 100, 1,000, or 10,000 (the number of U.S. deployed strategic warheads at the end of the Cold War), is an adequate measure of deterrence.

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Finally, the deterrent value of a punitive threat may depend not only on the type of retaliatory damage promised, but also on the limitation of that damage. In a future regional conflict—where U.S. national survival is not at stake, the fallout danger to neighboring countries is a concern, and post-conflict reconstruction is anticipated (as in Operation Iraqi Freedom or in a new Korean war)—any U.S. nuclear deterrent threat may need to be limited to be credible. A blunt threat of atomic apocalypse might be discounted as dubious rather than daunting by a shrewd opponent.

In short, tying confident predictions about deterrence to a particular number of warheads (and a related level of retaliatory damage) is ill-advised for a number of reasons: deterrence hinges on many known and unknown factors, making it inherently uncertain; some adversaries may not be deterred by threats of physical destruction, even if the promised damage is enormous; deterrence requirements—including requisite warheads—vary with opponent, context, and action to be deterred; the ability to avoid as well as inflict damage can affect the credibility of deterrent threats; and, finally, the necessary understanding of the opponent may be inadequate or missing altogether.

Moreover, the U.S. requirements for deterrence cannot equate to overall U.S. nuclear requirements because deterrence is not the only purpose served by U.S. nuclear forces. Those forces also should be capable of meeting other broad goals. One already has been discussed—**assurance** of allies that U.S. commitments to their defense, especially nuclear guarantees, are solid. U.S. capabilities that appear to be important to this goal are nuclear parity (or better) and forward-deployed (or deployable) nuclear forces, among other force characteristics. Two additional goals relevant to the size and shape of U.S. nuclear forces are damage limitation and dissuasion.

### ***Damage Limitation***

Damage from an attack could be limited through defensive measures (missile, air, and civil defenses), offensive strikes to prevent the launch of enemy missiles and bombers, and strategies for employing offensive forces in ways that might control escalation of a conflict. As in the past, damage-limiting capabilities today can offer insurance against the failure of deterrence. Now, however, that insurance could have much greater value than during the Cold War. With the United States facing several potential adversaries, rather than one major opponent, the chances increase that lack of mutual familiarity, misunderstanding, and miscommunication will lead to deterrence failure. In addition, both offensive and defensive damage limitation are likely to be more feasible against opponents armed with tens, rather than hundreds, of nuclear-armed ballistic missiles. Note in this regard the confidence expressed by high-ranking U.S. military commanders in the ability of existing defensive systems to intercept North Korean long-range ballistic missiles.<sup>26</sup>

And, as previously explained, damage-limiting capabilities not only may provide a measure of protection for the United States, but also may help protect allies by lending credibility to the deterrent threats made in their defense.

### ***Dissuasion***

“Dissuasion” refers to strategies and actions intended to discourage adversaries from developing threatening military capabilities, channel threats in less dangerous directions, shape military competition in ways favorable to the United States, and complicate the military planning and operations of opponents. Like deterrence, assurance, and damage limitation, dissuasion is not a new national security goal, but one with antecedents in past policy and strategy. The last two Quadrennial Defense Reviews (QDRs), for example, set dissuasion as a defense strategy objective, with the 2006 review calling for nuclear forces and related capabilities that help in “dissuading potential competitors.”<sup>27</sup> Looking further back, in the mid-1960s Defense Secretary Robert McNamara advised President Johnson that missile defense against an emerging Chinese ballistic missile force “might not only be able to negate that threat...but possibly discourage their production and deployment of such weapons altogether.”<sup>28</sup> While deterrence is aimed at preventing aggression and damage limitation at mitigating the consequences of deterrence failure, dissuasion is intended to inhibit adversaries from pursuing military activities in peacetime that could increase both the danger and the destructiveness of war.

In today’s security environment, dissuasion-related tasks for U.S. nuclear forces include discouraging rogue states from pursuing WMD arsenals and ballistic missiles, the Chinese from a “sprint toward [nuclear] parity,”<sup>29</sup> and Russia from reverting to its Cold War pursuit of a first-strike capability. The basic objective in each case is to make more difficult or less advantageous military activity that menaces the United States or its allies. For example, the threat of attack posed by strike systems (nuclear and non-nuclear) compels rogues to protect key WMD facilities (through concealment, dispersal, hardening, burial, redundancy, and defense), which adds costs, produces inefficiencies, and creates delays in WMD programs, making acquisition of WMD capabilities less attractive. Maintaining a sizable, diverse, and potent nuclear force makes it harder for China to catch up with the United States in this crucial dimension of military power. (The United States currently has hundreds more nuclear-capable delivery vehicles than China and an order of magnitude more operationally deployed warheads.)<sup>30</sup> The ability of the U.S. nuclear force to withstand attack—the result of force diversity, readiness, and protection—diminishes the strategic advantage Russia might otherwise hope to gain from improvements in its nuclear counterforce potential. Preserving the option to upload U.S. bombers, SLBMs, and ICBMs with additional warheads now kept in storage could help discourage either Russia or China from engaging in a nuclear arms competition with the United States. Missile defenses might cause adversaries to forgo investments in ballistic missiles, as McNamara speculated in the sixties, but much would depend on the effectiveness of the defenses, the wherewithal and will of the United States to persist in the measure-countermeasure game, and, of critical importance, the motivations,

goals, and perceptions of each adversary. The linkages between the actions of the United States and the behavior of an adversary are no more certain for dissuasion than they are for deterrence. As with deterrence, it is the adversary who ultimately decides whether dissuasion works.

Nuclear force planning should be guided, then, not only by what is needed for deterrence, but also by the goals of assurance, damage limitation, and dissuasion. The relationships among the four goals, it should be noted, are complex. For example, dissuading an adversary from acquiring an especially threatening military capability might be a more pressing problem, at least for a time, than deterring that opponent. Damage limitation ensures, at least to some extent, against the failure of deterrence, but also may reinforce deterrence by contributing to the credibility of certain threats. Because assurance involves allies, and deterrence, damage limitation, and dissuasion concern adversaries, force requirements for assurance may differ from those related to the other three goals. On the other hand, a single force characteristic may serve multiple goals. Nuclear parity, for instance, is useful for assurance and may be so for dissuasion.

### ***Goal-Related Force Requirements***

Regardless of the complexity of their interrelationships, all four goals pertain to the variety of adversaries, confrontations, and threats for which U.S. nuclear forces must be prepared. The challenges facing the nuclear forces are not simply those apparent today, but those that might emerge from what Secretary of Defense Robert Gates has called “a security landscape steadily growing more dangerous and unpredictable.”<sup>31</sup> To deal with multiple opponents, conflicts, and sets of opposing military capabilities, both now and in the future, the U.S. nuclear force as a whole will require a number of attributes, including:

- ***parity or better*** vis-à-vis nuclear-armed adversaries, to defend against the full range of opponents, meet alliance commitments, and discourage nuclear competition;
- ***capabilities for tailored deterrent threats*** specific to each adversary, based on what is known of leadership motivations, values, worldview, decision making, and behavior;
- ***forward deployments*** (or forward-deployable forces) to maintain, where needed, a nuclear presence overseas;
- ***augmentation options*** by which additional warheads can be loaded on bombers and ballistic missiles in response to changing political and military circumstances;
- ***survivability*** to withstand attack and respond with deliberation and control;

- **lethality** to hold at risk and, if necessary, neutralize designated targets, whether they are hard or soft, fixed or mobile, or area or point targets;
- **prompt weapons delivery** for striking time-sensitive targets in minutes rather than hours or days;
- **flexibility** to attack different types, sets, and combinations of military, leadership, and economic targets;
- **discriminate capabilities** (high delivery accuracy, controlled-effects weapons, and related attack planning) to limit civilian damage; and
- **diversity** (variety of delivery vehicles, weapons, warheads, deployment modes, basing, and the like) necessary for the other attributes.

Above all, U.S. nuclear forces will require **resilience**.

### **Need for Resilience**

“Resilience,” as defined by Webster, is the “ability to recover from or adjust easily to misfortune or change.” For U.S. nuclear forces, resilience is the ability to recover from or adjust to unfavorable strategic developments, technical difficulties, operational challenges, or technological surprises. Adverse strategic developments would include deterioration in U.S. relations with Russia or China that led to intensified military rivalry with one or both countries. Among the military-technical problems of concern would be a defect in a warhead type, significant deficiencies (structural, mechanical, or electronic) in delivery vehicles, or a notable decrease in the survivability or expected operational effectiveness of a force element due to improvement, perhaps of a sudden nature, in enemy offensive or defensive capabilities.

The resilience needed to respond to these potential hazards includes:

- First, the ability of the existing nuclear force posture (the current deployed force, readiness level, and weapons stockpile) to meet new political, military, and technical challenges without remedial changes;
- Second, the ability of that force posture to adapt to challenges through increased alert rates, warhead uploading, dispersal, redeployments, different tactics, and selective reallocation of tasks among force elements; and,
- Third, the ability of the force to remain effective through retrofits of deployed systems (with upgraded electronics, modified weapons, and other hardware fixes) or, over the longer run, the addition of follow-on missiles, aircraft, submarines, and weapons.

Ensuring that the nuclear force retains a significant degree of resilience is especially important today. In a fluid “security landscape” that is increasingly “dangerous and unpredictable,” resilience offers hedges against the uncertainties of international politics and military change. With little force modernization now programmed, resilience over the next few decades must come from the existing stock of nuclear delivery vehicles and warheads.<sup>32</sup> Most importantly, reductions in that existing stock under future arms treaties could impair the adaptability of the nuclear force. To avoid such an outcome, U.S. diplomats must negotiate agreements consistent with the requirement of resilience and cuts made by U.S. defense planners should be done with a clear eye toward maintaining a resilient force. Unless this broad guideline informs reductions, the U.S. nuclear force is likely to suffer decreases in the capabilities needed for assurance, deterrence, damage limitation, and dissuasion.

### ***Resilience and Force Reductions***

In considering future reductions in U.S. nuclear forces, it is important to recognize the substantial reductions that already have been made. They include the following:

- dismantlement of more than 13,000 warheads since 1988;
- reduction of the total nuclear stockpile by half between 2004 and 2007;
- reduction in ODSNWs from 10,000 in 1991 to some 2,100 today;
- reduction of non-strategic nuclear weapons to less than one-tenth their Cold War level;
- removal of all non-strategic nuclear weapons from surface ships and naval aircraft;
- dismantlement of all nuclear artillery shells, Lance missile warheads, and naval nuclear depth bombs;
- elimination of all but eight nuclear warhead types from the tens of types designed during the Cold War;
- retirement of more than 1,000 strategic missiles, 350 long-range bombers, 28 SSBNs, and 450 ICBM silos; and
- conversion of four Trident SSBNs to carry non-nuclear cruise missiles and removal of the B-1B bomber from a nuclear role.<sup>33</sup>

These past reductions have left limited margin for future cuts consistent with the need to preserve resilience. As further reductions are pursued, what are some general

guidelines for preserving resilience with a smaller force? One is that resilience is greater with more rather than fewer delivery vehicles because fewer delivery vehicles could diminish the ability of the force to survive attack, a fundamental basis of resilience. In addition, fewer delivery vehicles also means less capacity for uploading warheads in response to adverse international change. (U.S. bombers and ballistic missiles today do not carry their maximum payloads and the present strategic force as a whole is capable of carrying roughly twice the current number of operationally deployed warheads.)<sup>34</sup> In addition, with fewer delivery vehicles, options would be more limited for uploading one or two legs of the triad in response to a decrease in the expected effectiveness of a third (if, for example, the bomber force were to face more lethal air defenses and an offset involved increasing the number of deployed ballistic missile warheads).

Another guideline is that more rather than less force diversity provides greater resilience. This is the time-tested lesson of the nuclear triad and one of the key reasons for its continuity. Although the current force has a mix of delivery vehicles, weapons, warhead designs, and warhead yields, it also is a collection of one-of-a-kind weapon systems. This means there is only one type of ICBM (Minuteman III), SLBM (Trident D5), penetrating bomber (B-2), standoff bomber (B-52H), and air-delivered standoff weapon (ALCM). Having only one type of each weapon system limits resilience because a technical difficulty or operational challenge could afflict the entire type. Completely eliminating a type—all ICBMs, for example—might offer substantial savings (operation and maintenance, upgrade, and replacement outlays), but also would create further problems by removing a unique set of weapon system capabilities, reducing military options, and increasing force vulnerability, all of which would diminish resilience. In the case of ICBMs, complete elimination of Minuteman III missiles would significantly reduce the number of targets for an enemy first strike, the U.S. ability to attack hardened targets in minutes, the targeting flexibility afforded by single-warhead ballistic missiles, the upload capacity of the overall strategic force, and the diversity of the weapons stockpile (which hedges against warhead defects).

Trimming the triad—making cuts but maintaining three strategic force legs—would be more conducive to resilience. In fact, this is the alternative that has been followed for the many strategic arms reductions made to date. But, given those reductions, shrinking the triad further will likely have new drawbacks. The smaller each leg becomes, the less economical it will seem, because of the increased costs per unit and per deployed warhead. This cost consideration could undermine political support for the spending necessary to sustain and modernize even smaller numbers of each leg. The scientific, technical, and military cadres for developing, building, maintaining, and operating each leg also will grow smaller, and this could lead to problems of safety and force effectiveness, problems already experienced by the Air Force portions of the triad (which the service is working to correct).<sup>35</sup> A smaller triad also would have reduced upload capacity, less potential for adjusting the distribution of warheads among force legs, and increased force vulnerabilities (unless the threats posed by enemy capabilities also diminished). In addition, if a smaller triad with fewer SSBNs caused the Navy, on efficiency grounds, to consolidate all ballistic missile submarines at a single base,



assurance and deterrence could be adversely affected. The SSBN fleet currently is split between the Pacific and Atlantic, with bases at Bangor, Washington and Kings Bay, Georgia. Asian friends, as well as the Chinese, might see withdrawal of SSBNs from the Pacific base as indicating a weaker U.S. commitment to allied security. Similarly, basing all SSBNs at Bangor and withdrawing from the Atlantic might cause European allies to question the strength of ties between U.S. strategic forces and their defense. (Moreover, the British would lose access to the facilities at Kings Bay that support their D5 SLBMs.)<sup>36</sup>

A last guideline is that a reserve of non-deployed warheads in the nuclear weapons stockpile is essential for resilience. A varied inventory of reserve warheads is necessary for replacing warheads with safety or reliability problems, changing the mix of operationally deployed warheads, and uploading the force if necessary. During the last 15 years, a considerable number of warheads have been kept in the stockpile to support upload options. The Clinton administration referred to this as a “hedge,” while the Bush administration called it a “responsive capability.”<sup>37</sup> Due to the significant limitations of the U.S. nuclear weapons production infrastructure, the United States must rely more on its stockpile of existing warheads rather than the capability to produce more warheads for force resilience. If these infrastructure problems are addressed, the stockpile needed for this purpose likely could be reduced.

These guidelines—a combination of the numbers and types of delivery vehicles, force diversity, and a reserve of non-deployed warheads—should inform U.S. positions in the negotiation of the post-START treaty and in the planning for the post-START strategic force. From what is publicly known, some provisions of the emerging treaty are consistent with the guidelines. For example, the treaty will stipulate, according to the July 2009 Joint Understanding, “that each Party will determine for itself the composition and structure of its strategic arms.” Within the announced treaty limits, the United States probably can fashion a smaller triad that retains the qualities of survivability, flexibility, and resilience. The treaty will have a limit “in the range of 500-1100” for strategic delivery vehicles and another limit of 1,500-1,675 for their warheads. While the United States currently has some 798-882 strategic delivery vehicles actually in the force (see p. iv), it has roughly 1,100 “START-accountable” vehicles, a number that includes empty ICBM silos, non-nuclear B-1B bombers, and other vehicles no longer assigned nuclear missions.<sup>38</sup> If the U.S. strategic nuclear force remains at the upper end of the delivery vehicle range, preservation of a triad and its critical advantages should be possible. If not, maintaining a triad and its advantages would be more difficult, a concern emphasized by Gen. James Cartwright, vice chairman of the Joint Chiefs of Staff and former head of Strategic Command.<sup>39</sup>

### ***Additional Means for Mitigating the Risks of Nuclear Reductions***

Along with force resilience, greater reliance on non-nuclear offensive and defensive capabilities could help mitigate the risks of further nuclear reductions. Current and future non-nuclear strike systems—ballistic missiles, manned and unmanned aircraft, cruise

missiles, hypersonic missiles, boost-glide vehicles, and other delivery means—might substitute for nuclear weapons against some portion of the targets included in U.S. war plans. “[T]here is a large target set,” according to Gen. Cartwright, “which we can go at with conventional [weapons].”<sup>40</sup> Better intelligence and analysis regarding the functions, locations, and vulnerabilities of targets could aid the substitution of non-nuclear for nuclear weapons and make possible more efficient targeting of the latter, something which could also reduce nuclear requirements.

Non-nuclear strike systems cannot be considered complete substitutes, however. Non-nuclear means may not provide comparable deterrent effect in some cases, may not counterbalance the nuclear or biological weapons capabilities of others, nor adequately support the leadership position of the United States in its military alliances. Furthermore, high-confidence destruction rather than temporary neutralization of certain priority targets may require nuclear weapons; command posts and WMD facilities located hundreds of feet underground are examples. And extensive replacement of nuclear forces by non-nuclear systems would entail considerable expense and risk because non-nuclear weapons must be delivered in larger numbers, by more missiles or aircraft, in more strikes and restrikes, even with smarter targeting.

With a smaller nuclear force, improved non-nuclear missile defenses might assume more of the burden for limiting damage from ballistic missile attack. Enemy missiles would be intercepted in flight rather than destroyed on the ground. Defenses might reduce the number of nuclear weapons allocated against fixed missile launchers (which might fire their missiles before they were struck) and against the suspected locations of mobile launchers (which could be numerous). Depending on their level of effectiveness, defensive systems might become the preferred means for dealing with the mobile missiles that represent an increasing portion of the hostile nuclear forces facing the United States and its allies. Detecting, tracking, and intercepting missiles after launch might prove less difficult than finding, acquiring, and attacking dispersed and hidden mobile launchers.

If non-nuclear strike capabilities are to mitigate the risks of nuclear reductions, then they cannot be constrained by nuclear arms agreements. Russia would like to limit both U.S. non-nuclear strike systems and missile defenses in the post-START treaty because they are areas of military advantage for the United States. The July 2009 Joint Understanding indicates that the prospective treaty will contain provisions on “the impact of intercontinental ballistic missiles and submarine-launched missiles in a non-nuclear configuration on strategic stability” and “the interrelationship of strategic offensive and strategic defensive arms.” Any Russian proposals to convert these relatively innocuous-sounding statements into formal limitations on non-nuclear strike systems and missile defenses should be firmly rejected by the United States.

Revitalization of the nuclear weapons infrastructure also could contribute to risk mitigation for further nuclear reductions. Non-deployed warheads in the nuclear stockpile now provide the hedge against technical problems with nuclear warheads and,

through upload options, unfavorable political and military developments. Reliance is placed on stockpiled warheads because the United States, alone among the nuclear-armed countries, lacks a fully functional nuclear warhead production capability. With a future capability to produce adequate numbers of replacement and augmentation warheads within appropriate timelines, a growing share of the hedge could be shifted to the infrastructure and concomitant decreases could be made in the stockpile of non-deployed warheads.

### ***Future Force Modernization***

Maintaining resilience and mitigating risk with a smaller nuclear force have been the focus of the forgoing discussion because current fiscal and political realities make significant nuclear force modernization unlikely. Spending on strategic nuclear forces over the last decade and a half has accounted for only two-to-three percent of annual defense budgets (in comparison to an average of eight percent during the 1970s and 1980s).<sup>41</sup> Present economic problems, increasing non-defense expenditures, and the demands of two wars limit new claims on the defense budget. Since the end of the Cold War, the executive branch, Congress, and the services have shown little interest in pursuing nuclear force modernization. Nuclear reductions have been the order of business. At some point, however, questions of force modernization will have to be faced squarely. The Minuteman III will reach the estimated end of its service life between 2020 and 2030, the Trident SSBN around 2027, the ALCM by 2030, the B-52H and B-2 around 2035, and the Trident D5 in 2040.<sup>42</sup> Although these dates may seem far in the future, the 10-15 years typically needed for major system acquisition means decisions to start modernization programs must be made much earlier.<sup>43</sup> And the exigencies of the “dangerous and unpredictable” security environment could lend urgency to modernization plans, just as other “security alarms”—the Korean war, the tensions associated with the bomber and missile “gaps,” and the Soviet military advances in the 1970s—prompted past buildups in U.S. strategic forces. Force modernization will raise new issues besides those that now challenge defense planners as they contemplate further force reductions. But the set of broad goals—assurance, deterrence, damage limitation, and dissuasion—and goal-related requirements outlined here will remain important to the size, structure, and other qualities of U.S. nuclear forces.

### **V. A Note on Nuclear Elimination**

There are those who favor not simply reductions in nuclear weapons but their complete elimination. This vision, often called “nuclear abolition” or “nuclear zero,” originated at the outset of the nuclear era, periodically attracted increased support, and recently has been revived, notably by former Secretaries of State George Shultz and Henry Kissinger, former Secretary of Defense William Perry, and former Senator Sam Nunn.<sup>44</sup> President Obama, who has met with the four men, endorses the goal of nuclear elimination.<sup>45</sup> In his April 2009 speech in Prague, the president declared “America’s commitment to seek the peace and security of a world without nuclear weapons.”<sup>46</sup>

While the vision of nuclear elimination has appeal, its realization would depend on an unprecedented transformation of international politics. Several fundamental contradictions in the various nuclear zero initiatives will prevent their success.

### ***U.S. Pursuit of Elimination Can Increase Proliferation***

Proponents of elimination assert that steps toward nuclear zero by the United States would make other countries less likely to acquire nuclear weapons. In reality, the opposite could be true. As discussed in the section on extended deterrence and assurance, U.S. nuclear guarantees have played a critical role in convincing a number of allied countries not to build nuclear weapons of their own. To the extent zero-inspired policies and force posture changes compromised the credibility of U.S. guarantees, allies menaced by the threat of WMD use or overwhelming conventional attack would have reason to embrace, not abjure, nuclear weapons. Deep reductions and a diminished U.S. nuclear presence in the Pacific, for example, might lead Japan to “go nuclear.” China then might feel compelled to step up its nuclear buildup, which could put further pressure on India to increase its nuclear arsenal, perhaps in turn inducing Pakistan to do the same.

### ***U.S. Conventional Superiority Creates Nuclear Incentives for Others***

Conventional superiority, according to advocates of nuclear zero, enables the United States to reduce reliance on nuclear weapons and move toward their eventual abolition. Proponents of zero argue that the manifest air, land, and maritime predominance of U.S. general-purpose forces makes resort to nuclear threats or use unnecessary. Those same powerful conventional forces, however, make adversaries seek nuclear and other weapons of mass destruction to counter the same U.S. advantage, which works against the prospect of general nuclear disarmament. Furthermore, allies threatened by those WMD-armed countries depend on the protection of the U.S. nuclear umbrella, making it more difficult for the United States to forgo nuclear weapons. Where that protection is absent or ineffective, allies may develop indigenous nuclear arsenals to defend themselves.

The same U.S. conventional superiority that supposedly facilitates the U.S. embrace of zero will likely preclude Russian cooperation on nuclear elimination, which would be essential to the success of the endeavor. This point has been emphasized by Russian sources. The United States would be hard-pressed to make deep nuclear reductions if these were not done in conjunction with Russia. Yet Moscow depends on nuclear forces, particularly theater-range nuclear weapons, to compensate for deficiencies in the conventional capabilities that defend its borders. Indeed, Russia maintains a 10:1 advantage over the United States in non-strategic nuclear weapons.<sup>47</sup> With chronic tensions along its periphery and insecurity over its conventional weaknesses, Russia is unlikely to be a reliable partner on the path toward nuclear zero.

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***Verification and Enforcement Dilemmas Impede Elimination***

Proposals for nuclear elimination rightly call for an “airtight” verification and enforcement regime. Without such a regime, some states inevitably would not comply with their elimination commitments. At zero or very low numbers of nuclear weapons, even a few hidden bombs could provide a violator with great coercive leverage and military potential. And countries otherwise prepared to abide by their commitments would have an incentive to maintain nuclear weapons as insurance against cheating by others.

The experience to date with international agreements that ban chemical and biological weapons is not reassuring in this regard. The Chemical Weapons Convention and Biological and Toxin Weapons Convention have not resulted in anything approaching zero for these categories of WMD. Not only are there holdouts, but, more important, there has been significant cheating and no verified reversal of the violations. The United States was willing to sign the agreements, despite the risks of cheating by others, in part because it retained nuclear weapons to deter chemical or biological use. Now advocates of nuclear zero propose to eliminate that hedge.

Nor does the failure of international efforts to pressure North Korea and Iran to abandon their nuclear weapons programs offer much hope that a zero agreement would be strictly enforced. These two cases demonstrate the limits of cooperation and concerted action among sovereign states with often competing interests and varying perceptions of risk. Many members of the international community might be unwilling to pay the price of forcing recalcitrant countries to relinquish their nuclear capabilities, capabilities seen by those countries as the ultimate guarantors of their security and unique symbols of national prestige. Members who perceived less danger from violators and believed that their interests would be better served by accommodation might act to restrain other countries whose interests and fears compelled them to take more assertive positions.

The same lack of trust among states that would make necessary an “airtight” verification and enforcement regime also would prevent states from ceding authority and power to the international organization essential to that regime. How could they make such a transfer when some states might not disarm and the international organization itself might prove hostile to their interests? This dilemma alone is likely to prove an insuperable obstacle to the effective functioning of the compliance organization necessary for nuclear zero.

***Elimination Depends on the Unlikely Transformation of the World Order***

To achieve nuclear zero, the international order would have to be such that all pertinent countries could conclude that their interests would be best served by forgoing nuclear weapons. The United States and its allies no longer would need nuclear weapons for deterrence and assurance. Others no longer would need nuclear weapons to counter U.S. conventional superiority. All would need confidence that long-standing disputes and any new conflicts would be resolved peacefully. Nuclear weapons would need to be

judged as unnecessary for deterrence, assurance, trumping an opponent's conventional superiority, or balancing opponents' WMD. An airtight verification and enforcement regime under a trusted and powerful international organization would need to be established. And all of these conditions would need to appear enduring; otherwise some countries would retain hidden nuclear weapons as a hedge.

In short, a basic transformation in the nature of states and the structure of the international system would be required, from a system of competitive states with autonomous power and authority to an essentially cooperative world order, or to an order overseen by a universally trusted international or centralized institution. The realization of either alternative would constitute the greatest transformation of the international system in history. That such a dramatic transformation would be necessary for nuclear elimination does not mean that the goal is impossible. But it does suggest that near-term disarmament steps should not be predicated on such an elusive end. Indeed, the road to nuclear zero involves so many unknowns that steps taken now in the hope of promoting nuclear zero are as likely to have unintended consequences that endanger U.S. and allied security as to advance the goal of elimination. Moreover, making elimination a policy priority could encourage political opposition to measures needed to sustain U.S. nuclear capabilities in the world as it is, not as proponents of zero believe it ought to be.

## **VI. Conclusions**

As the United States negotiates nuclear reductions and plans for a smaller nuclear force, several key points should be kept in mind:

- The nuclear forces of the United States serve critical purposes in addition to deterring nuclear coercion or attack. They can help deter escalation of crises, deter or counter chemical or biological attacks, deter or defeat large-scale conventional aggression, and hold at risk or neutralize priority targets resistant to non-nuclear attack.
- Nuclear forces protect a large number of allies as well as the United States itself. Allies must be assured that any force posture changes will not weaken their security. Otherwise their ties with the United States could be strained and they could feel pressure to acquire nuclear weapons of their own. Forward-deployed forces are important for the assurance of allies as well as the deterrence of aggression.
- As insurance against the failure of deterrence, the United States should maintain capabilities for limiting the damage from a nuclear attack. Damage-limiting capabilities include offensive forces, force employment strategies for preventing conflict escalation, and defensive measures, including missile defense and civil defense. Changes since the Cold War—the greater

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uncertainties of deterrence and the greater possibilities for countering smaller nuclear forces—suggest an increased role for damage limitation.

- Nuclear forces with the appropriate size, structure, survivability and lethality could help dissuade adversaries from pursuing military activities that would increase the danger and destructiveness of war (for example, rogue state acquisition or improvement of WMD capabilities, an intensified Chinese nuclear buildup, or a Russian return to first-strike ambitions).
- The United States should never be in a position of nuclear inferiority, whether real or perceived, in relation to other countries. U.S. nuclear parity (or better) remains important for assuring the security of allies and may help to discourage nuclear competition and aggression by adversaries.
- Nuclear forces must be kept resilient, especially as they grow smaller. Resilience is the ability to recover from or adjust to unfavorable strategic changes, technical difficulties, operational challenges or technological surprises. During the Cold War, resilience to a significant extent was inherent in the large, varied, and regularly modernized nuclear forces and the supporting defense-industrial infrastructure then maintained by the United States. Now it must be an explicit and central objective of nuclear force planning. In the absence of significant modernization, resilience will depend on preserving a force with more rather than fewer delivery vehicles, more rather than less force diversity, and a reserve of non-deployed warheads. Retaining a triad of SLBMs, ICBMs, and bombers contributes significantly to resilience.
- In addition to resilience, greater reliance on non-nuclear offensive and defensive capabilities could mitigate some of the risks of nuclear reductions. If non-nuclear strike systems and missile defenses are to play this role, however, they cannot be limited by arms agreements.
- A nuclear force capable of deterring aggression, assuring allies, limiting damage, dissuading competition, and adapting to change must be diverse, survivable, flexible, lethal, able to be used with discrimination, forward deployable (for some force elements in certain cases), and suitable for augmentation. Warhead numbers alone do not define force adequacy.
- Assurance, deterrence and dissuasion require not only the appropriate forces, but careful understanding of the worldviews and decision making of others, along with application of that understanding to force planning.
- Fundamental flaws in the proposal for nuclear elimination almost certainly will prevent its realization. Basing current policy on this problematic long-term objective could diminish U.S. and allied security.

## Notes

<sup>1</sup> Quoted in Melanie Kirkpatrick, "The Weekend Interview With James R. Schlesinger: Why We Don't Want a Nuclear-Free World," *Wall Street Journal*, July 11-12, 2009, p. A9.

<sup>2</sup> See Kurt Guthe, *Ten Continuities in U.S. Nuclear Weapons Policy, Strategy, Plans, and Forces* (Fairfax, Va.: National Institute for Public Policy, 2008).

<sup>3</sup> "Joint Understanding," signed by President Barack Obama and Russian Federation President Dmitry Medvedev in Moscow, July 6, 2009, Office of the White House Press Secretary release, July 8, 2009.

<sup>4</sup> "Fleet Ballistic Missile Submarine—SSBN," Navy fact sheet, May 11, 2009; Hans M. Kristensen, "U.S. Strategic Submarine Patrols Continue at Near Cold War Tempo," Federation of American Scientists Strategic Security Blog, March 16, 2009, available at <http://www.fas.org>; Department of the Air Force, *Air Force Handbook for the 109<sup>th</sup> Congress* (Washington, D.C.: Department of the Air Force, 2005), pp. 68-70, 123, 139; Secretary of Defense Task Force on DoD Nuclear Weapons Management, *Phase I Report: The Air Force's Nuclear Mission* (Washington, D.C.: Department of Defense, September 2008), p. D-1; *U.S. Air Force Long-Range Strike Aircraft White Paper* (Washington, D.C.: Department of the Air Force, November 2001), p. 2; and Maj. Gen. C. Donald Alston, USAF, Air Force assistant chief of staff for strategic deterrence and nuclear integration, prepared statement before the Senate Armed Services Committee Subcommittee on Strategic Forces, June 3, 2009, p. 7.

<sup>5</sup> Bureau of Verification, Compliance, and Implementation, "The Legacy of START and Related U.S. Policies," Department of State fact sheet, July 16, 2009. "Operationally deployed strategic nuclear warheads" are defined by the United States as "reentry vehicles on ICBMs in their launchers, reentry vehicles on SLBMs in their launchers onboard submarines, and nuclear armaments loaded on heavy bombers or stored in weapons storage areas of heavy bomber bases. ...a small number of spare strategic nuclear warheads (including spare ICBM warheads)...located at heavy bomber bases [are] not consider[ed]...to be operationally deployed strategic nuclear warheads." "Article-by-Article Analysis of the Treaty Between the United States of America and the Russian Federation on Strategic Offensive Reductions," in Senate Foreign Relations Committee, *Treaty on Strategic Offensive Reduction: The Moscow Treaty*, S. Hrg. 107-622, 107<sup>th</sup> Cong., 2d sess. (Washington, D.C.: GPO, 2002), p. 271.

<sup>6</sup> Natural Resources Defense Council Nuclear Program, "Table of US Strategic Offensive Force Loadings, 1945-2012," November 25, 2002, available at <http://www.nrdc.org>.

<sup>7</sup> *Department of Defense Annual Report to the President and the Congress* (Washington, D.C.: GPO, February 1995), p. 88.

<sup>8</sup> Secretary of Defense Task Force on DoD Nuclear Weapons Management, *Phase I Report*, op. cit., transmittal letter by Task Force Chairman James Schlesinger.

<sup>9</sup> Written response for the record by Secretary of Defense Donald Rumsfeld in Senate Foreign Relations Committee, *Treaty on Strategic Offensive Reduction*, op. cit., p. 117.

<sup>10</sup> "NATO's Nuclear Forces in the New Security Environment," fact sheet, January 24, 2008, available at <http://www.nato.int>.



<sup>11</sup> Defense Science Board Task Force on Future Strategic Strike Forces, *Final Report* (Washington, D.C.: Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, February 2004), pp. 5-8.

<sup>12</sup> For information on the evolution of U.S. nuclear attack options since the Kennedy administration, see Desmond Ball, "The Development of the SIOF, 1960-1983," in Desmond Ball and Jeffrey Richelson, eds., *Strategic Nuclear Targeting* (Ithaca, N.Y.: Cornell University Press, 1986), pp. 57-83; Leon Sloss and Marc Dean Millot, "U.S. Nuclear Strategy in Evolution," *Strategic Review*, Vol. 12, No. 1 (Winter 1984), pp. 19-28; Ernest R. May, John D. Steinbruner, and Thomas W. Wolfe (Alfred Goldberg, ed.), *History of the Strategic Arms Competition, 1945-1972, Part II* (Washington, D.C.: Historical Office, Office of the Secretary of Defense, March 1981) (Top Secret/Restricted Data/No Foreign Dissemination; declassified in part), pp. 592, 596-600, 607, 804-805, available at <http://www.dod.mil/pubs/foi/rdroom.html>; General Accounting Office, *Strategic Weapons: Nuclear Weapons Targeting Process*, NSIAD-91-319FS (Washington, D.C.: General Accounting Office, September 1991), pp. 11-13; L. Wainstein et al., *The Evolution of U.S. Strategic Command and Control and Warning, 1945-1972*, S-467 (Arlington, Va.: Institute for Defense Analyses, June 1975) (Secret; declassified, September 1992), pp. 290-291, available at <http://www.dtic.mil>; Draft Memorandum from Secretary of Defense McNamara to President Johnson, subj: Recommended FY 1965-FY 1969 Strategic Retaliatory Forces, December 6, 1963 (Top Secret; declassified in part, January 5, 1983), pp. I-33-I-34, available at <http://www.dod.mil/pubs/foi/rdroom.html>; Draft Memorandum from Secretary of Defense McNamara to President Johnson, subj: Strategic Offensive and Defensive Forces, January 15, 1968 (revised) (Top Secret; declassified in part), pp. 6, 9, available at <http://www.dod.mil/pubs/foi/rdroom.html>; Draft Memorandum from Secretary of Defense Clark Clifford to President Johnson, subj: Strategic Offensive and Defensive Forces, January 9, 1969 (Top Secret; declassified in part), pp. 5, 6, 12, available at <http://www.dod.mil/pubs/foi/rdroom.html>; Terry Terriff, *The Nixon Administration and the Making of U.S. Nuclear Strategy* (Ithaca, N.Y.: Cornell University Press, 1995); William Burr, "The Nixon Administration, the 'Horror Strategy,' and the Search for Limited Nuclear Options," *Journal of Cold War Studies*, Vol. 7, No. 3 (Summer 2005); Burr, "'To Have the Only Option That of Killing 80 Million People is the Height of Immorality': The Nixon Administration, the SIOF, and the Search for Options, 1969-1974," *National Security Archive Electronic Briefing Book No. 173*, November 23, 2005, available at <http://www.gwu.edu/~narchiv/>; Secretary of Defense James R. Schlesinger, in Senate Foreign Relations Committee, *U.S.-U.S.S.R. Strategic Policies*, 93d Cong., 2d sess. (Washington, D.C.: GPO, 1974); Schlesinger, in Senate Foreign Relations Committee, *Briefing on Counterforce Attacks*, 93d Cong., 2d sess. (Washington, D.C.: GPO, 1974); Secretary of Defense Harold Brown, in Senate Foreign Relations Committee, *Nuclear War Strategy*, 96<sup>th</sup> Cong., 2d sess. (Washington, D.C.: GPO, 1981) (Top Secret hearing held on September 16, 1980; sanitized and printed on February 18, 1981); William E. Odom, "The Origins and Design of Presidential Decision [sic]-59: A Memoir," in Henry D. Sokolski, ed., *Getting MAD: Nuclear Mutual Assured Destruction, Its Origins and Practice* (Carlisle, Pa.: Army War College Strategic Studies Institute, November 2004); Secretary of Defense Caspar Weinberger, in Senate Foreign Relations Committee, *U.S. Strategic Doctrine*, 97<sup>th</sup> Cong., 2d sess. (Washington, D.C.: GPO, 1983), pp. 18-20; Weinberger, *Department of Defense Annual Report to the Congress for Fiscal Year 1987* (Washington, D.C.: GPO, February 5, 1986), pp. 74-75; Dick Cheney, *Department of Defense Annual Report to the President and the Congress* (Washington, D.C.: GPO, January 1991), p. 51; R. Jeffrey Smith, "U.S. Trims List of Targets in Soviet Union," *Washington Post*, July 21, 1991, p. A1; Deputy Secretary of Defense John M. Deutch, in Senate Armed Services Committee, *Briefing on Results of the Nuclear Posture Review*, S. Hrg. 103-870, 93d Cong., 2d sess. (Washington, D.C.: GPO, 1994), p. 13; William S. Cohen, *Department of Defense Annual Report to the President and the Congress* (Washington, D.C.: GPO, 1998), p. 57; R. Jeffrey Smith, "Clinton Directive Changes Strategy on Nuclear Arms," *Washington Post*, December 7, 1997, p. A10;

Donald H. Rumsfeld, *Department of Defense Annual Report to the President and the Congress* (Washington, D.C.: GPO, 2002), pp. 84, 85, 87; Deputy Assistant Secretary of Defense for Forces Policy Brian Green, remarks at the 36<sup>th</sup> Annual Institute for Foreign Policy Analysis-Fletcher Conference on National Security Policy, "Nuclear and Non-Nuclear Forces in 21<sup>st</sup>-Century Deterrence: Implementing the New Triad," Washington, D.C., December 14, 2005, transcript available at <http://www.fletcherconference.com/oldconf.htm>; and Secretary of Energy Samuel W. Bodman and Secretary of Defense Robert M. Gates, *National Security and Nuclear Weapons in the 21<sup>st</sup> Century* (Washington, D.C.: Department of Energy and Department of Defense, September 2008), p. 13.

<sup>13</sup> Quoted in Barton Gellman, "U.S. and China Nearly Came to Blows in 1996," *Washington Post*, June 21, 1996, p. A1.

<sup>14</sup> For a more detailed discussion of allied views, see Chapter III of *Planning the Future U.S. Nuclear Force*.

<sup>15</sup> President George W. Bush, Remarks on the Situation in North Korea, October 9, 2006, in *Weekly Compilation of Presidential Documents*, Vol. 42, No. 41 (October 16, 2006), p. 1768; Secretary of State Condoleezza Rice, Remarks With Japanese Foreign Minister Taro Aso After Their Meeting, Tokyo, October 18, 2006, Department of State transcript; Secretary of Defense Donald Rumsfeld, Pentagon News Briefing with South Korean Minister of National Defense Yoon Kwang-Ung, October 20, 2006, Department of Defense transcript; and Remarks by President Obama and President Lee Myung-Bak of the Republic of Korea in Joint Press Availability, June 16, 2009, Office of the White House Press Secretary release.

<sup>16</sup> Keith B. Payne, in House Armed Services Committee, *U.S. Nuclear Weapons Policy*, HASC No. 110-73, 110<sup>th</sup> Cong., 1<sup>st</sup> sess. (Washington, D.C.: GPO, 2008), p. 56; and Kang Ch'an-ho, "Totally Different ROK and US Explanation of the Outcome of SCM; and US Official Says 'Nothing New,'" *JoongAng Ilbo* (Internet version), October 27, 2006, translated by Open Source Center, Doc. ID: KPP2006102703700.

<sup>17</sup> John S. Foster, member of the Congressional Commission on the Strategic Posture of the United States, hearing before the Senate Armed Services Committee, May 7, 2009, committee transcript, p. 22; and remarks by a former senior U.S. official, workshop on "Exploring the Implications of U.S. Extended Deterrence for Its Nuclear Posture," Center for Strategic and International Studies, June 3, 2009.

<sup>18</sup> Conversation between NIPP staff and a Japanese official, January 15, 2009.

<sup>19</sup> Quoted in "Japan, US Discuss Nuclear Deterrence," Agence France Presse, July 18, 2009.

<sup>20</sup> Rebecca Hersman and Robert Peters, "Nuclear U-Turns: Learning from South Korean and Taiwanese Rollback," *Nonproliferation Review*, Vol. 13, No. 3 (November 2006), pp. 539-553; and Kurt M. Campbell, Robert J. Einhorn, and Mitchell B. Reiss, eds., *The Nuclear Tipping Point: Why States Reconsider Their Nuclear Choices* (Washington, D.C.: Brookings Institution, 2004).

<sup>21</sup> Testimony before Senate Governmental Affairs Committee, *The Future of Nuclear Deterrence*, S. Hrg. 105-159, 105<sup>th</sup> Cong., 1<sup>st</sup> sess. (Washington, D.C.: GPO, 1997), p. 11.

<sup>22</sup> Quoted in Joseph Kahn, "Chinese General Threatens Use of A-Bombs If U.S. Intrudes," *New York Times*, July 15, 2005, p. A8.

<sup>23</sup> Thomas Erdbank, "Ahmadinejad Criticized for Saying Long-Ago Imam Mahdi Leads Iran," *Washington Post*, May 8, 2008, p. A13; and Paul Hughes, "Iran President Paves the Way for Arabs' Imam Return," Reuters, November 17, 2005.

<sup>24</sup> Bernard Lewis, "August 22: Does Iran Have Something in Store?" *Wall Street Journal*, August 8, 2006, p. A10.

<sup>25</sup> "Privileged interests" and "border regions" are phrases used by Russian President Dmitry Medvedev. See Andrew E. Kramer, "Russia Claims Its Sphere of Influence in the World," *New York Times*, September 1, 2008, p. A6.

<sup>26</sup> Adm. Timothy J. Keating, USN, commander, U.S. Pacific Command, in Martha Raddatz and Lauren Sher, "U.S. Ready to Respond to N. Korea Missile," ABC News, February 26, 2009, available at <http://abcnews.go.com>; Gen. Victor E. Renuart, Jr., USAF, commander, U.S. Northern Command, hearing before the Senate Armed Services Committee, March 17, 2009, committee transcript, pp. 27-28, 47; Gen. James E. Cartwright, USMC, vice chairman, Joint Chiefs of Staff, hearing before the Senate Armed Services Committee, June 16, 2009, committee transcript, p. 41; Gen. Renuart, in Bill Gertz, "U.S. 'Ready' for N. Korean Missile," *Washington Times*, July 2, 2009, p. A1; and Gen. Walter L. Sharp, USA, commander, U.S. Forces Korea, Department of Defense briefing, July 14, 2009, Federal News Service transcript.

<sup>27</sup> Department of Defense, *Quadrennial Defense Review Report* (Washington, D.C.: Department of Defense, September 30, 2001), pp. iv, 11, 12, 15, 36, 57, 58, 62, 71; and Department of Defense, *Quadrennial Defense Review Report* (Washington, D.C.: Department of Defense, February 6, 2006), pp. 30, 49.

<sup>28</sup> Draft Memorandum From Secretary of Defense McNamara to President Johnson, Subject: Recommended FY 1967-71 Strategic Offensive and Defensive Forces, November 1, 1965, in Department of State, *Foreign Relations of the United States, 1964-1968, Vol. X: National Security Policy* (Washington, D.C.: GPO, 2002), p. 305.

<sup>29</sup> The phrase is Donald Rumsfeld's. See his testimony in Senate Foreign Relations Committee, *Treaty on Strategic Offensive Reduction*, op. cit., p. 81.

<sup>30</sup> For data on Chinese nuclear delivery vehicles and warheads, see Robert S. Norris and Hans M. Kristensen, "Nuclear Notebook: Chinese Nuclear Forces, 2008," *Bulletin of the Atomic Scientists*, Vol. 64, No. 3 (July/August 2008), pp. 42-45.

<sup>31</sup> Speech at the Economic Club of Chicago, July 16, 2009, Department of Defense release. See also Gates, speech at the Carnegie Endowment for International Peace, October 28, 2008, Department of Defense release.

<sup>32</sup> While the Navy has a program to replace Trident submarines with new SSBNs beginning in 2028, the Air Force has no comparable programs for follow-on bombers or ICBMs. Neither service has committed to new non-strategic nuclear systems. The nuclear weapons infrastructure (labs, plants, and workforce) has insufficient capacity for producing plutonium pits and thus cannot build nuclear weapons in number. See Rear Adm. Stephen E. Johnson, USN, director, Navy Strategic Systems Programs, speech to the National Defense University/National Defense Industrial Association Seminar, July 23, 2009, prepared text; Secretary of Defense Robert M. Gates, Defense Budget Recommendation Statement, April 6, 2009, Department of Defense release; Marc V. Schanz, "Minuteman Extended, and Beyond," Daily Report Archive, *Airforce-Magazine.com*, July 31, 2009; Congressional Commission on the Strategic Posture of

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<sup>33</sup> "Progress Towards Nuclear Disarmament by the United States of America," NPT/CONF.2010/PC.III/WP.31, working paper submitted by the United States of America to the Preparatory Committee for the 2010 Review Conference of Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Third Session, New York, May 4-15, 2009, pp. 2-3; and John Harvey, director of the policy planning staff, National Nuclear Security Administration, "US Nuclear Weapon Programmes: Implications for Non-Proliferation," in Joseph F. Pilat and David S. Yost, eds., *NATO and the Future of the Nuclear Non-Proliferation Treaty* (Rome: NATO Defense College, May 2007), p. 74.

<sup>34</sup> Secretary of State Colin L. Powell and Secretary of Defense Donald H. Rumsfeld, in Senate Foreign Relations Committee, *Treaty on Strategic Offensive Reduction*, op. cit., pp. 41-43, 72, 111-112.

<sup>35</sup> Secretary of Defense Task Force on DoD Nuclear Weapons Management, *Phase I Report*, op. cit.; and Air Force Nuclear Task Force, *Reinvigorating the Air Force Nuclear Enterprise* (Washington, D.C.: Headquarters United States Air Force, October 24, 2008).

<sup>36</sup> Secretary of State for Defence and Secretary of State for Foreign and Commonwealth Affairs, *The Future of the United Kingdom's Nuclear Deterrent* (London: Her Majesty's Stationery Office, December 2006), p. 26.

<sup>37</sup> Deutch in Senate Armed Services Committee, *Briefing on Results of the Nuclear Posture Review*, op. cit., pp. 11-12, 14, 48-49; Rumsfeld, *Department of Defense Annual Report to the President and the Congress*, op. cit., pp. 89-90; and Douglas J. Feith, under secretary of defense for policy, in Senate Armed Services Committee, *Department of Defense Authorization for Appropriations for Fiscal Year 2003, Part 1*, S. Hrg. 107-696, Pt. 1, 107<sup>th</sup> Cong., 2d sess. (Washington, D.C.: GPO, 2003), pp. 328-329.

<sup>38</sup> Bureau of Verification, Compliance, and Implementation, "The Legacy of START and Related U.S. Policies," op. cit.

<sup>39</sup> Testimony in hearing before the Senate Armed Services Committee, July 9, 2009, committee transcript, p. 22.

<sup>40</sup> Quoted in Elaine M. Grossman, "Senior U.S. General Sees High Nuclear Threshold," Global Security Newswire, October 2, 2007, available at <http://gsn.nti.org/gsn/>.

<sup>41</sup> Department of Defense, *National Defense Budget Estimates for FY 2010* (Washington, D.C.: Department of Defense, June 2009), p. 76.

<sup>42</sup> Secretary of Defense Task Force on DoD Nuclear Weapons Management, *Phase II Report: Review of the DoD Nuclear Mission* (Washington, D.C.: Department of Defense, December 2008), Table 3-1, p. 30.

<sup>43</sup> Defense Science Board, *Creating a DOD Strategic Acquisition Platform* (Washington, D.C.: Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, April 2009), p. 1.

<sup>44</sup> Henry A. Kissinger, Sam Nunn, William J. Perry, and George P. Shultz, "A World Free of Nuclear Weapons," *Wall Street Journal*, January 4, 2007, p. A15.

<sup>45</sup> Remarks by the President After Meeting with Former Secretary of State George Schultz [sic], Former Secretary of State Henry Kissinger, Former Senator and Chairman of the Armed Services Committee Sam Nunn, and Former Secretary of Defense William Perry to Discuss Key Priorities in U.S. Non-Proliferation Policy, May 19, 2009, Office of the White House Press Secretary release.

<sup>46</sup> Remarks by President Barack Obama, Hradcany Square, Prague, Czech Republic, April 5, 2009, Office of the White House Press Secretary release.

<sup>47</sup> Thomas P. D'Agostino, under secretary for nuclear security, Department of Energy and administrator, National Nuclear Security Administration, in hearing before the Senate Armed Services Committee Subcommittee on Strategic Forces, June 3, 2009, Federal News Service transcript.



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Before his retirement from the Department of Defense, Dr. Schneider served in a number of senior positions within the Office of Secretary of Defense for Policy, including Principal Director for Forces Policy, Principal Director for Strategic Defense, Space and Verification Policy, Director for Strategic Arms Control Policy and Representative of the Secretary of Defense to the Nuclear Arms Control Implementation Commissions. He also served in the senior Foreign Service as a member of the State Department Policy Planning Staff, the Professional Staff of the Senate Select Committee on Intelligence, the Department of Energy, the Energy Research and Development Administration and the Atomic Energy Commission. Prior to his government career, Dr. Schneider served as a Senior Political Scientist with the BMD Corporation and as a policy analyst with the Stanford Research Institute.

**Henry Sokolski** is the Executive Director of the Nonproliferation Policy Education Center, a Washington-based nonprofit organization founded in 1994 to promote a better understanding of strategic weapons proliferation issues for academics, policy makers, and the media. He served from 1989 to 1993 as Deputy for Nonproliferation Policy in the Office of the Secretary of Defense and earlier in the Office of Net Assessment and as a legislative military aide in the U.S. Senate. Mr. Sokolski has authored and edited a number of works on proliferation-related issues including, *Best of Intentions: America's Campaign Against Strategic Weapons Proliferation*.

He currently serves as an adjunct professor at the Institute of World Politics in Washington, and as a member of the Congressional Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism, to which he was appointed in May 2008. In addition, Mr. Sokolski has been a resident fellow at the National Institute for Public Policy, the Heritage Foundation, and the Hoover Institution.

**Dr. Andrei Shoumikhin** is a Visiting Professor at the Graduate Department of Defense and Strategic Studies of Missouri State University. Until recently, he worked as Senior Analyst at the National Institute for Public Policy. He has expertise in arms control, ballistic missile defense, U.S.-Russian strategic relations, and Russian foreign and military policies.

From 1995 to 1998, he was Director of the Washington Office of the Moscow Public Science Foundation coordinating the Foundation's projects in the United States. From 1976 to 1996, Dr. Shoumikhin was associated with the Institute of USA and Canada Studies of the Russian Academy of Sciences. From 1992 to 1996, he was head of the Institute's U.S. Regional Policy Department. He headed the USA Institute's Center for the Middle East from 1989 to 1992. In these positions, he was responsible for analyses of U.S. foreign policy and the preparation of recommendations for use by the Russian president, parliamentary committees and various ministries.

In addition to his work at the USA Institute, from 1987 to 1996 Dr. Shoumikhin was President of the Center for Conflict Resolution, a non-profit organization studying political, economic and social conflict between and within states of the former Soviet Union.

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## About the Reviewers

- **Dr. Kathleen Bailey**, *Former Assistant Director of the Arms Control and Disarmament Agency*
- **Dr. Barry Blechman**, *Co-Founder of the Henry L. Stimson Center*
- **ADM Henry Chiles** (ret), *Former Commander-in-Chief, U.S. Strategic Command*
- **Ms. Paula DeSutter**, *Former Assistant Secretary of State for Verification and Compliance*
- **Dr. Mark Esper**, *Executive Vice President, U.S. Chamber of Commerce*
- **Dr. John Foster**, *Former Director of Defense Research and Engineering for the Department of Defense and Former Director of the Lawrence Livermore Laboratory*
- **Dr. Aaron Friedberg**, *Professor of Politics and International Affairs at Princeton University and Former Deputy Assistant to the Vice President for National Security Affairs*
- **Dr. Colin Gray**, *Professor and Director, Centre for Strategic Studies, Department of Politics and International Relations, University of Reading, United Kingdom*
- **Amb. Max Kampelman**, *Ambassador to the Conference on Security and Cooperation in Europe under Presidents Carter and Reagan*
- **Mr. Erin Moore**, *Former Vice President for Missiles and Space, Lockheed Martin*
- **Dr. Gordon Oehler**, *Senior Fellow at the Potomac Institute of Policy Studies*
- **Mr. Michael Rühle**, *Brussels, Belgium*
- **Maj Gen Robert Smolen, USAF** (ret), *Former Deputy Administrator for Defense Programs at the U.S. Department of Energy's National Nuclear Security Administration (NNSA)*
- **Mr. Henry Sokolski**, *Executive Director of the Nonproliferation Policy Education Center*
- **Dr. Petr Suchý**, *Head of the Department of International Relations and European Studies, Masaryk University, Brno, Czech Republic*
- **Dr. Bruno Tétrais**, *Senior Research Fellow at the Fondation pour la Recherche Stratégique, Paris, France*









