


# MINIMUM DETERRENCE: EXAMINING THE EVIDENCE



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# **Minimum Deterrence: Examining the Evidence**



*The National Institute for Public Policy has produced an important and insightful report that is a must-read for policymakers interested in the future of America's nuclear strategy. At a time when the United States is again weighing reductions in our nuclear weapons arsenal, this report makes a timely and compelling case against the key assumptions of "minimum deterrence."*

*Senator Jon Kyl and Senator Joseph Lieberman*



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\*The authors are responsible for the views expressed in this report; these views do not reflect the official policy or position of the National Institute for Public Policy, the Department of Defense, or any institution with which the authors are affiliated.

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## Preface

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Proposals for the U.S. adoption of a Minimum Deterrence approach to deterrence can be traced to the 1950s. The common theme of these proposals is that U.S. nuclear deterrence goals can be underwritten by a relatively small, finite number of nuclear weapons, and that the United States should establish a correspondingly modest definition of its nuclear requirements. As such, Minimum Deterrence recommendations regarding the numeric requirement for U.S. nuclear weapons range from a few to hundreds. Enthusiasm for these proposals as the proper guidance for U.S. policy has waxed and waned over the decades, but actual U.S. policy under Democratic and Republican administrations by and large has not reflected the Minimum Deterrence narrative. Most recently, the Obama administration's embrace of the goal of "nuclear zero," and deep nuclear reductions as milestones en route to that goal appear to have given Minimum Deterrence new vigor, at least in the public debate of U.S. policy about deterrence, nuclear forces and arms control. Given the apparent increasing salience of the Minimum Deterrence definition of deterrence and its corresponding measures of adequacy for U.S. forces, a careful examination of the consistency of its basic assumptions and points with available evidence seems timely. Given its longevity, one would think that there would be many previously-published systematic and comprehensive efforts upon which to draw. This appears not to be the case; I could find no such previous book or report, and not for a lack of trying.

This monograph, *Minimum Deterrence: Examining the Evidence*, is an initial attempt to fill that void and to identify points of departure for measuring U.S. nuclear force requirements consistent with available evidence. It reflects the work of many hands and numerous iterations. The Senior Reviewers took their task very seriously and provided literally hundreds of points to be added or deleted, corrections and helpful suggestions with regard to precise wording. I would like to thank them and each of the authors of initial draft sections for their careful and patient work. In particular, I would like to thank the Honorable James Schlesinger for the considerable time and effort he devoted to this undertaking. Similarly, I would like to thank the Sarah Scaife Foundation for making this work possible. It is the first in a planned series of monographs examining the U.S. goals of deterrence, extended deterrence and the assurance of allies, and how to think about the corresponding U.S. standards of adequacy for measuring "how much is enough?"

*Keith B. Payne*  
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## Executive Summary

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Minimum Deterrence proposals claim that a relatively small number of nuclear weapons, measured in single digits to hundreds, is an adequate nuclear force for all pertinent U.S. deterrence missions, including extending U.S. nuclear deterrence coverage to U.S. allies. The vulnerability of an adversary's population and economy to nuclear weapons and the assumed high value of these targets to opposing leaders is the basis for the confident claims of Minimum Deterrence proponents that U.S. deterrence requirements can be met with a small number of nuclear weapons.

Contemporary proponents of Minimum Deterrence often argue that reducing to low nuclear force levels would:

- provide deterrence that is more “stable” and greater safety than otherwise would be the case;
- facilitate nuclear arms control agreements and successful non-proliferation policies;
- provide substantial savings in the defense budget; and,
- help create the conditions necessary for a more peaceful world order and help realize the goal of eliminating nuclear weapons entirely, i.e., “nuclear zero.”

Recently, some U.S. officials and serving military officers have openly expressed support for the basic points and recommendations of Minimum Deterrence. Given the increased visibility of Minimum Deterrence and its potential to shape forthcoming U.S. policy decisions, it is important to identify the fundamental assumptions, logic and related conclusions of Minimum Deterrence proposals, and determine whether they are sound and consistent with available empirical evidence.

Minimum Deterrence claims generally are predicated on the following series of eight interrelated propositions:

1. Deterrence will function reliably and predictably at low U.S. nuclear force numbers, now and in the future. U.S. conventional forces can substitute in many cases for nuclear forces to meet U.S. deterrence goals.
2. Nuclear deterrence considerations no longer are pertinent to U.S. relations with Russia and China.
3. Nuclear weapons are irrelevant to today's most pressing security threat—weapons of mass destruction (WMD) terrorism.
4. Deterrence considerations alone determine the size and composition of the nuclear force requirements.
5. Ballistic missile submarines (SSBNs) will remain invulnerable for 30 to 50 years. So, a small SSBN fleet can provide most or all of the nuclear capability needed for U.S. deterrence needs, now and in the future.
6. The number of nuclear weapons and the risk of accidents and crises are directly correlated (more nuclear weapons means increased risk, while a decrease in their number reduces the risk).

7. U.S. nuclear force reductions are essential to, and will strengthen non-proliferation efforts; reductions also will facilitate further arms control progress. The Nuclear Non-Proliferation Treaty (NPT) requires U.S. movement toward nuclear disarmament.
8. A small number of nuclear weapons is adequate for deterrence; thus U.S. defense spending can be reduced considerably by reducing nuclear forces.

Not all proposals for Minimum Deterrence include each of the eight elements. Several are of more recent vintage. But, a systematic examination reveals that these elements, implicitly or explicitly, are part of the contemporary Minimum Deterrence narrative.

The Obama administration's expressed policy positions undergirding its initiatives for nuclear reductions implicitly or explicitly reflect some, but not all of these eight Minimum Deterrence points. Particularly apparent in this regard is the presumed ability to predict with confidence and precision how deterrence and extended deterrence will work at much lower U.S. nuclear force levels.

Each of these eight points is described and critically examined here.

**1. Deterrence will function reliably and predictably at low U.S. nuclear force numbers, now and in the future. U.S. conventional forces can substitute in many cases for nuclear forces to meet U.S. deterrence goals**

Minimum Deterrence makes promises about deterrence working at very low nuclear force levels, now and in the future. Such promises are predicated on the presumption that all rational leaders will reliably perceive their situations and make decisions as necessary for deterrence to work predictably at Minimum Deterrence force levels. Yet, historical evidence demonstrates conclusively that such promises and presumption cannot be taken seriously, in part because leadership decision making can be highly variable and idiosyncratic. Leaders often do not perceive their situations and make decisions according to the predictable common script presumed by Minimum Deterrence. They can perceive the world differently, make decisions differently and respond to pressure differently.

For this same reason, the promise that advanced conventional forces will substitute with comparable deterrent effect is not credible. They may very well provide a useful complement to U.S. capabilities for deterrence and the assurance of allies, as may theater ballistic missile defenses. But there is no basis for the confident generalization that these systems can substitute reliably for U.S. nuclear forces for deterrence purposes, now or in the future.

The requirements for deterrence working are highly dependent on the opponent and context of any given contingency. In some cases it appears that nuclear threats can contribute uniquely to deterrence because they can make the consequences of aggression appear uncontrollable and incalculable to a would-be aggressor. We are unlikely to know in advance when such deterrent threats will make the difference between war and peace, but it appears to have done so on occasion in the past.

In the contemporary dynamic and uncertain security environment, prediction of opponent decision making is particularly challenging because of the diversity of decision makers and contexts. In this environment, the flexibility, diversity, resilience, and adaptability of U.S. forces

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and planning may contribute critically to deterrence by providing a spectrum of U.S. threats to deter a broad range of opponents and types of aggression. The value of these qualities may be enormous in an era when a single deterrence failure could be catastrophic.

In some cases U.S. non-nuclear or even non-military power may be adequate to provide the needed deterrent; in other cases, diverse types and significant numbers of U.S. nuclear forces may be necessary for effective deterrence threats. For example, an opponent may place highest value on its instruments of state power and its own survival. The number and type of U.S. capabilities necessary to threaten such assets credibly could be far beyond that recommended by Minimum Deterrence, especially if that opponent has taken steps to protect itself against U.S. deterrence threats.

Similarly, in the post-Cold War international environment, the United States may need to deter multiple opponents simultaneously, including Russia, China, North Korea, and prospectively a nuclear-armed Iran and other state sponsors of terror. This list will evolve and possibly expand over the course of time. Again, the number and diversity of U.S. nuclear capabilities needed to hold all of their respective most highly-valued assets at risk for deterrence purposes could easily surpass the relatively small, fixed arsenals envisaged under Minimum Deterrence. Those assets may be as diverse as is the list of opponents, and identifying them almost certainly will include an inherent degree of uncertainty. In this context, no one can claim with any credibility to know that some fixed and relatively small set of U.S. nuclear capabilities will be adequate to deter, now and in the future, a diverse and dynamic list of opponents.

In addition, in those possible future cases where the United States and allies face an opponent with great local conventional force superiority (possibly abetted by chemical and biological weapons), it will be the United States and allies that must confront the aggressor with the threat of nuclear escalation or suffer great local defeat. It is far from clear that the narrow escalation options available with a Minimum Deterrence nuclear arsenal could support U.S. deterrence goals in such a case.

Since the Cold War, the number of U.S. deployed nuclear weapons has been cut by over 85 percent. Still, Minimum Deterrence proposals aim to lock in further deep force reductions. Doing so could easily narrow U.S. nuclear threat options and threaten the flexibility, resilience and adaptability necessary to deter in a dynamic, uncertain security environment. In 2010, Gen. Kevin Chilton, commander of U.S. Strategic Command, stated in testimony before the Senate that the 1,550 deployed warhead ceiling of the New Strategic Arms Reduction Treaty (START) was the lowest level he could endorse given the need to preserve U.S. force flexibility and diversity.<sup>1</sup> Similarly, in 2012, Lt. Gen. James Kowalski, Commander of Air Force Global Strike Command, cautioned that any further reductions, “need to be bounded by the realpolitik of international relations.”<sup>2</sup> There has been no apparent great benign transformation of international relations since to suggest that much lower force levels would sustain the flexibility and diversity of U.S. forces that may be critical for deterrence purposes.

There may be prudent options for future nuclear arms negotiations and reductions. But, recognition of the linkage between the prospects for effective deterrence and the U.S. arsenal’s flexibility and diversity suggests that U.S. considerations of force sizing should become less of a mechanistic quest for ever-lower numbers and tighter restrictions, and focus more on retaining



an arsenal of sufficient size to provide the flexibility, diversity and resilience of U.S. forces needed for deterrence in a dynamic and uncertain era.

Finally, Minimum Deterrence proponents often recommend that U.S. deterrence threats focus on opponents' civilian targets as the basis for deterrence because such threats are compatible with very low U.S. force numbers. But this Minimum Deterrence approach has legal, moral and credibility problems—which is why it has been rejected consistently by Democratic and Republican administrations for decades.

## **2. Nuclear deterrence considerations no longer are pertinent to U.S. relations with Russia and China.**

This Minimum Deterrence claim reflects hopeful thinking that is contrary to much available evidence that suggests otherwise. At a time when the United States is reducing both defense expenditures and nuclear weapons, Russia and China are not. At a time when Minimum Deterrence proposals assert that hostilities between the United States and Russia or China are implausible, both countries are talking and acting on the opposite premise. Hoping that benign relations will prevail for now and the future is reasonable; ignoring or discounting opponents' expressions of hostility, and instead basing U.S. calculations of deterrence requirements on hope, is not reasonable.

## **3. Nuclear weapons are irrelevant to today's most pressing security threat—weapons of mass destruction (WMD) terrorism.**

The common assertion that nuclear terrorism is the priority threat facing the United States may be true. If so, that priority could shift rapidly and dramatically back to state-based WMD threats against which nuclear deterrence may be uniquely effective. However, even if nuclear terrorism is and remains the priority threat, state-based WMD threats remain, as does the corresponding value of U.S. nuclear capabilities for deterrence and the assurance of allies.

Moreover, the claim that U.S. nuclear deterrence is irrelevant to countering the threat of nuclear terrorism almost certainly is mistaken. Severe threats, including nuclear, may be needed to communicate to state sponsors of terrorism the high stakes involved if they facilitate in any way a terrorist WMD attack on the United States or its allies. The challenge for deterrence is to exploit the vulnerabilities of each state sponsor to convince those parties that such help would risk a devastating response.

Case studies of conflicts between states and non-state actors (NSAs) demonstrate that offensive threats have produced positive results in changing the calculus of terrorist organizations and their sponsors. The use of severe threats against state sponsors and supporters of terrorist organizations, such as Hezbollah, Hamas, and core al-Qa'ida, should not be discarded. The use of severe threats to help deter state sponsors from enabling terrorist nuclear attacks has been recent U.S. policy. Such "indirect deterrence" also was used in the past by the Soviet Union and by Israel. It may be a key to deterring NSAs in the future, and U.S. nuclear capabilities may contribute. Nuclear weapons are not relevant to deterring all types of threats, but they may play an important role in constraining state supporters of terrorism from enabling mass-casualty WMD attacks.

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#### **4. Deterrence considerations alone determine the size and composition of the nuclear force requirements.**

Minimum Deterrence proposals base nuclear force-sizing requirements on a relatively small number of weapons deemed to be adequate for deterrence. Typically, no further goals shape the recommended size or character of the U.S. nuclear arsenal. For example, in Minimum Deterrence proposals, the goal of assuring allies is not included separately in the calculation of U.S. requirements. This lack of distinction is important to the narrative because it removes any unique U.S. nuclear requirements for assurance that might otherwise push U.S. nuclear requirements beyond Minimum Deterrence standards.

Yet, assuring allies of their security is a long-standing U.S. strategic goal. For decades, the United States has provided an extended deterrence commitment, including the “nuclear umbrella,” to NATO allies, Japan, South Korea and Australia. This assurance of allies was key in some cases to allies seeking membership in NATO and to their continuing commitment to remain non-nuclear. Thus, the U.S. assurance of allies has contributed enormously to nuclear non-proliferation and should be a significant consideration in the size and composition of U.S. nuclear forces. As is noted in the report of the Congressional Commission on the Strategic Posture of the United States,<sup>3</sup> this assurance of allies imposes unique nuclear requirements for the United States.

The goal of limiting damage to the United States and allies also should be a factor in determining the size and other characteristics of the U.S. nuclear force. Deterrence may fail for a range of reasons that cannot reliably be precluded now or in the future; and, if deterrence does fail, reducing damage to U.S. society and allies will be the highest national priority. During the Cold War, many considered this to be a hopeless goal given the very large Soviet nuclear arsenal. However, in the post-Cold War era, there are multiple limited WMD threats against which U.S. damage-limiting capabilities could provide a meaningful measure of protection.

Under current conditions, properly including the U.S. national policy objectives of assurance and damage limitation in force sizing could result in U.S. forces that are larger in number and much more diverse than deemed necessary by Minimum Deterrence. But, prudent support for these key objectives should not be a casualty of the Minimum Deterrence mode of measuring requirements solely according to its definition of deterrence.

#### **5. Ballistic missile submarines (SSBNs) will remain invulnerable for 30 to 50 years. So, a small SSBN fleet can provide most or all of the nuclear capability needed for U.S. deterrence needs, now and in the future.**

According to most Minimum Deterrence proposals, U.S. nuclear deterrence requirements can be met with a relatively small number of deployed forces based entirely or mostly on SSBNs armed with submarine-launched ballistic missiles (SLBMs), with one or both of the other legs of the nuclear triad—long-range bombers and intercontinental ballistic missiles (ICBMs)—reduced or eliminated. These proposals rely heavily on the belief that SSBNs are invulnerable and will remain so for decades.

If the U.S.-deployed nuclear force consists primarily of a small number of submarines at sea, the ability to locate and track those submarines would likely become an even higher-priority goal

for certain opponents. These adversaries might then focus more resources on developing anti-submarine warfare (ASW) capabilities and operational innovations directed against U.S. SSBNs. With a Minimum Deterrence force structure based largely or solely on a small number of U.S. SSBNs, if an adversary could track, and then neutralize, the few SSBNs at sea, that adversary would have tremendous leverage over the United States and deterrence could fail. Minimum Deterrence proponents appear to ignore the potentially serious risk associated with the possibility that their long-term prediction of continuing SSBN invulnerability will prove wrong. Democratic and Republican administrations alike have sustained the nuclear triad in large part to hedge against that very risk.

**6. The number of nuclear weapons and the risk of accidents and crises are directly correlated (more nuclear weapons means increased risk, while a decrease in their number reduces the risk).**

Advocacy of a Minimum Deterrence force often reflects the belief that the number of nuclear weapons is a principal determinant of the risks of nuclear war, accidents and theft. Thus, weapon reductions, especially to a Minimum Deterrence level, is said to lessen these risks.

Nuclear accidents, crises, thefts and false alarms can be serious potential dangers. Yet, the asserted relationship between nuclear numbers and nuclear dangers is not borne out by historical data from the decades of the U.S.-Soviet Cold War. The Cold War experience offers evidence that such occurrences are not caused by increases in the numbers of nuclear weapons and would not be diminished by decreases to the Minimum Deterrence level. Those who claim otherwise have yet to describe the causal links between weapon numbers and these risks or to provide evidence contrary to the available historical evidence. The problems they identify are potentially serious, but their solution does not appear to address those problems.

**7. U.S. nuclear force reductions are essential to, and will strengthen non-proliferation efforts; reductions also will facilitate further arms control progress. The Nuclear Non-Proliferation Treaty (NPT) requires U.S. movement toward nuclear disarmament.**

Minimum deterrence proponents assert that lowering reliance on nuclear weapons and adopting very low force levels would encourage—or even be essential to—nuclear non-proliferation and further negotiated nuclear arms reductions. These claims assume the existence of a strong, and specific, cause-and-effect relationship between the U.S. nuclear force posture and other countries' strategic choices on nuclear weaponry. In this purported relationship, other countries' interest in acquiring or keeping nuclear weapons is directly proportional to the size of the American arsenal. In other words, it is assumed that others will lose interest in possessing nuclear weapons, and become more willing to cooperate with us against proliferation, if and as we reduce or abandon our arsenal. By adopting Minimum Deterrence, the United States purportedly will lead the way to progressively deeper negotiated reductions ending in eventual global nuclear disarmament, and persuade actual and potential proliferators to change their ways.

In reality, there is no sign of any such beneficial impact or relationship to date, and little, if any, basis for expecting that U.S. nuclear reductions will have these effects in the future. Indeed, if anything, just the opposite is true. Further deep reductions as recommended by Minimum Deterrence would likely eliminate whatever leverage the U.S. might now retain to motivate

Russian or Chinese nuclear reductions. And, contrary to the beliefs of Minimum Deterrence advocates, experience to date tells us that U.S. nuclear reductions are unlikely to inspire disarmament or non-proliferation rectitude in others. After two decades of dramatic post-Cold War U.S. nuclear reductions and four years of pro-disarmament U.S. nuclear policy, the case for future diplomatic, arms control and non-proliferation benefits of Minimum Deterrence remains exceedingly dubious. So far, “minimalist” approaches have proven essentially fruitless in these regards, and there is no apparent reason to expect that this will change in the future.

**8. A small number of nuclear weapons is adequate for deterrence; thus U.S. defense spending can be reduced considerably by reducing nuclear forces.**

Minimum Deterrence proposals claim that effective deterrence can be maintained based on a small number of U.S. nuclear weapons rather than a large, diverse and more costly nuclear arsenal. They typically argue that any possible degradation in deterrence resulting from deep nuclear reductions can be mitigated with U.S. conventional forces and *regional* missile defense. Consequently, most presentations of Minimum Deterrence claim large potential cost saving via the reduction of nuclear forces without any loss of deterrence.

Nuclear forces represent a very small fraction of U.S. defense spending; the vast majority of U.S. defense dollars are spent in support of non-nuclear capabilities. And, the potential savings from reducing the number of weapons are likely to be modest given the fact that many of the costs involved for a nuclear arsenal are determined largely by factors independent of the number of warheads. As Dr. Don Cook of the National Nuclear Security Administration said in recent testimony, there are not “substantial savings” possible from reducing the number of nuclear warheads because many of the associated costs are independent of the number of warheads.<sup>4</sup>

In addition, the costs involved in substituting advanced non-nuclear forces as replacements for nuclear forces for deterrence would likely overwhelm any savings from reductions in the latter. Minimum Deterrence presentations typically count only the possible savings from not developing and deploying U.S. nuclear forces; they do not take into account the costs associated with the recommended measures to strengthen deterrence via added U.S. conventional capabilities. The U.S. and NATO went through this comparison of options in the past and reached the reasonably obvious conclusion: in the context of serious nuclear and conventional threats, conventional force improvements to compensate for significantly reduced reliance on nuclear weapons would be prohibitively expensive and insufficient to duplicate the nuclear deterrent. There is no apparent reason to conclude that the calculation of the various costs and savings associated with Minimum Deterrence recommendations would yield a significantly different conclusion today.

**How Does Minimum Deterrence Fare Against Available Evidence and What Alternative Guidelines May Be Better?**

When the core Minimum Deterrence propositions are examined against available evidence, it is apparent that they are demonstrably false, implausible or self-contradictory.

For example, the Minimum Deterrence claim that deterrence, as a rule, is irrelevant to countering terrorism is false. Terrorists can be deterred in some circumstances, and there is no

reason to dismiss the potential for U.S. nuclear capabilities to contribute by helping to deter their state sponsors from undertaking severely threatening forms of support for their terrorist clients.

Minimum Deterrence also promises substantial savings via the reduction of U.S. nuclear weapons. Yet, any reasonable *net assessment* of the costs and savings from Minimum Deterrence recommendations will likely show a need to increase defense spending given the corresponding added burden on U.S. conventional forces.

Minimum Deterrence implicitly claims that it provides the proper measure of adequacy for the U.S. nuclear arsenal. This is an important claim because it allows Minimum Deterrence effectively to omit from consideration other key strategic goals that would suggest requirements beyond those necessary for deterrence. However, these goals—which include the assurance of allies and limiting damage if deterrence fails—cannot be ignored. They are separate from deterrence and yield separate requirements.

These three key Minimum Deterrence propositions are false. The remaining five points prominent in the contemporary Minimum Deterrence narrative are the basis for its promise that deep nuclear reductions would produce great benefit and pose little or no risk. Yet, they are not supported by demonstrable evidence and, in most cases, are contrary to available experience. They are questionable at best.

It is impossible, for example, to predict credibly that U.S. relations with Russia and China will be so benign that these countries no longer need to be part of U.S. nuclear deterrence considerations. That prediction is inconsistent with considerable current evidence, including Russian statements and actions. For example, Alexi Arbatov, noted Russian defense expert and former deputy chairman of the Russian Duma's Defense Committee, reports that the beliefs underlying current Russian policy include the following: Russia is surrounded by enemies led by the United States; the United States and its allies may invade Russia anytime to seize its natural riches; nuclear weapons are the basis for Russian security; and, correspondingly, U.S. calls for nuclear disarmament are a malicious U.S. trick.<sup>5</sup> Western observers may see such beliefs as paranoid nonsense, but according to Arbatov, within Russia they are not controversial.

Noted Russian journalist Pavel Felgenhauer, writes that in return for improved relations Russian President Putin demands that the United States:<sup>6</sup>

- accept Russia's veto over "any future U.S.-led military action;"
- accept Moscow's reintegration and leadership "of the post-Soviet landmass;" and,
- treat any "dissidents inside Russia as terrorists."

Felgenhauer also reports that Putin sees U.S.-Russian relations as a "practically irreconcilable" zero-sum competition: "if we do not get them, then they will get to us." He quotes Putin as observing that Russia cannot hope "to work in peace...this is the truth of life."<sup>7</sup>

Regardless of how we would like to view Russia and China, their open-source discussions of goals, threats and strategy point both to the United States as enemy number one and to the great relevance they attribute to their nuclear weapons. Making this point is not to repeat a Cold War perspective; it is to acknowledge a contemporary reality.

In addition, it is impossible to claim credibly that deterrence will work reliably at low force levels, now or in the future. Such unbounded promises cannot be considered plausible because the human decision making that ultimately determines the success or failure of deterrence is not so predictable.

For the same reason, no one can claim credibly that U.S. conventional deterrence threats can substitute predictably for nuclear threats. They never deterred reliably in the past, and the increasing lethality of conventional forces against some types of targets may mean much or nothing for deterrence purposes, depending on how opponents view those forces—which, again, is not predictable with precision.

Likewise, the promises that U.S. nuclear reductions will strengthen non-proliferation, inspire Russia, China and other powers to follow the U.S. lead, and reduce incidents of accident and theft, are all contrary to considerable historical evidence. Indeed, instead of helping, U.S. deep nuclear reductions would, in some cases, likely undermine U.S. non-proliferation goals. Available evidence demonstrates that some key allies already are wary of U.S. nuclear disarmament trends given their reliance on a credible U.S. nuclear umbrella. Further U.S. movement in this direction could degrade the credibility of U.S. assurances to these allies and correspondingly increase allied interest in indigenous nuclear capabilities—thereby undermining U.S. non-proliferation goals. Deep reductions could inspire a cascade of proliferation among friends and allies who otherwise would likely continue to rely on the U.S. nuclear umbrella. There is considerable contemporary evidence of this dynamic.

In addition, available historical data show no correlation between the number of nuclear weapons and accidents; the prospect for accidents appears to be determined by factors other than warhead numbers.

Finally, the prediction of SSBN invulnerability for the next half century may prove prescient; hopefully so. This is a key Minimum Deterrence claim because it is the basis for the recommendations to reduce the number of SSBNs and eliminate or reduce other legs of the triad. However, the many possibilities for rapid technological advancement in ASW technologies and the danger of surprise should caution against basing U.S. policy on any such promises. Up to now, the U.S. has sustained at least 14 SSBNs and the three legs of the nuclear triad to guard against such challenges.

Much of the basic structure of the Minimum Deterrence argument and its recommendations has been around since the 1950s. Given this longevity, it is, perhaps, surprising that it contains multiple significant arguments and points that are internally contradictory.

For example, Minimum Deterrence recommends that the United States exploit its conventional force advantages to reduce its own reliance on nuclear weapons and thus inspire others to stand back from nuclear weapons and rally against nuclear proliferation. However, available open evidence demonstrates that some states, particularly including Russia, China and North Korea, place great emphasis on their nuclear weapons as the only means of defeating U.S. conventional advantages.<sup>8</sup> Consequently, the substitution of U.S. advanced conventional capabilities for nuclear as recommended by Minimum Deterrence advocates is very likely to lead these countries to emphasize nuclear forces even more rather than follow the U.S. lead toward nuclear disarmament.

In addition, it cannot be true both that nuclear weapons are now essentially irrelevant in our security relations with Russia and China, and that nuclear arms-reductions agreements with Russia and China would provide any great direct security benefit to the United States. The United States typically is unconcerned about the number of French or British nuclear weapons and engages in no such negotiations with them, presumably because they pose no threat to the United States. If U.S. relations with Russia and China are so amicable that nuclear deterrence truly no longer is pertinent, then there is no direct security value in focusing on negotiations to reduce incrementally the number of their nuclear weapons. Yet one of the great benefits of Minimum Deterrence is said to be that it would facilitate such negotiations.

Also, Minimum Deterrence claims that maintaining effective deterrence is a priority goal. Yet, deep nuclear reductions would degrade the U.S. force characteristics that may now be most important for deterrence, i.e., the flexibility and diversity necessary to adapt as needed to help deter a spectrum of severe threats in widely-differing scenarios. The bipartisan Strategic Posture Commission's 2009 report emphasized the value of U.S. nuclear force flexibility and diversity to facilitate the U.S. ability to adapt deterrence as needed. Consequently, it strongly endorsed preservation of the existing U.S. nuclear triad.<sup>9</sup> This flexibility and diversity is linked to the size and character of the U.S. nuclear arsenal, and further deep U.S. reductions now could threaten to degrade those critical qualities of the U.S. arsenal.

In addition, if deterrence is easily secured at very low force numbers, as Minimum Deterrence advocates claim, then it must be true that the United States itself is vulnerable to deterrence by states with small survivable nuclear arsenals, prospectively including North Korea and Iran. If so, the advantages of possessing even a small nuclear force are likely to appear exceedingly attractive to such countries and U.S. reduction of its nuclear arsenal hardly can be expected to have a beneficial non-proliferation effect on these states. Rather, validating Minimum Deterrence may spur them and others to seek nuclear capabilities all the more by lowering the apparent bar for securing a coercive nuclear capability against the United States.

Finally, the functioning of deterrence is not predictable and in some potential cases it would likely fail. If so, no plausible level of nuclear reductions would provide protection for U.S. civilian centers. Yet, Minimum Deterrence proponents also generally reject U.S. national missile defense and other defensive capabilities to protect against nuclear attack. They claim that such capabilities will hamper movement toward deep reductions. Consequently, Minimum Deterrence policies would likely increase the prospects for deterrence failure while simultaneously denying the United States defensive systems that might provide some protection in that event. This would be the worst of all worlds. The emergence of new nuclear powers with modest arsenals and extreme hostility for the United States—including the recent severe North Korean nuclear missile threats to the United States—suggests the great potential value and practicality of some U.S. strategic defensive capabilities.

### **The Potential Degradation of Deterrence and Assurance at Very Low U.S. Force Numbers**

The problem with Minimum Deterrence is not only that it rests on false, implausible or self-contradictory claims. More important is the fact that its recommended deep force reductions and no “new” U.S. nuclear capabilities would likely undermine the U.S. capacity to deter opponents and assure allies. A Minimum Deterrence posture would:

- offer fewer choices among warheads and delivery modes and restrict the U.S. capability to adapt to new threats in the future—thereby limiting U.S. flexibility and threat options that may be key to the effectiveness of U.S. deterrence strategies now and in the future;
- inevitably move U.S. deterrence strategies toward threats against predominantly civilian targets and/or threats against a small set of military targets; such threats may well be inadequate and/or incredible for some deterrence purposes, while purposefully targeting civilian centers violates long-standing moral norms;
- ease the strategic and technical challenges for opponents who might seek to counter our deterrence strategies and static nuclear capabilities, now or in the future;
- encourage rather than deter some opponents from arms competition and challenges to our deterrence strategies;
- threaten the U.S. capability to assure allies and thereby encourage some to acquire their own nuclear deterrents—and a possible “cascade” of nuclear proliferation; and,
- render U.S. deterrence forces more vulnerable to opponent covert deployments or cheating on arms control agreements in the absence of significant U.S. hedging measures and/or wholly unprecedented and intrusive verification measures.

Brent Scowcroft and Arnold Kanter rightly observed in the past that, “It is not at all clear that reducing strategic forces would increase stability... The burden of proof should be on those who advocate such reductions to demonstrate exactly how and why such cuts would enhance security.”<sup>10</sup> The overarching guidelines for U.S. thinking and policy regarding the measures of adequacy for U.S. forces should reflect an understanding of contemporary realities and available evidence. Minimum Deterrence reflects neither.

### **Guidelines That Do Fit Available Evidence**

The same evidence that demonstrates Minimum Deterrence claims to be false, dubious or self-contradictory also suggests a better set of guidelines given contemporary realities. The nine guidelines below are fully in line with the conclusions of the bipartisan Congressional Strategic Posture Commission’s 2009 report.

- The threat environment can change rapidly. U.S. calculations of force requirements must take into account that U.S. nuclear deterrence strategies need to be applicable to great nuclear powers, peers, regional opponents, and state sponsors of terror who might otherwise feel greater license to enable terrorist organizations to acquire weapons of mass destruction.
- In such an environment, for deterrence to be as effective as possible, informed estimates of U.S. deterrence requirements must be based on an understanding of opponents’ diverse perceptions, values and likely modes of decision making in a wide variety of threat contexts. And, deterrence must be designed to apply over an extended time horizon, not just current conditions.
- Ample available evidence from historical cases demonstrates that nuclear weapons have contributed uniquely to the deterrence of both war and the escalation of conflict. Historical case studies and some anthropological studies suggest that the deterrent effect of nuclear weapons follows from the prevalent understanding that they threaten



incalculable and uncontrollable consequences. This potentially unique deterrent effect of nuclear weapons should be taken into account in any determination of U.S. force requirements and reductions.

- In a highly-dynamic environment, deterrence requirements will be as varied and shifting as are opponents and contexts. A fixed approach will not fit all opponents and occasions. It is logical and reasonable in such an environment to expect that U.S. deterrence forces with flexibility and resilience can help U.S. deterrence strategies adapt to shifting requirements and be as effective as is possible. These key deterrence qualities are linked to the size and diversity of the U.S. arsenal and their preservation should be a high priority in the calculation of U.S. force adequacy. It is for this reason that the bipartisan Strategic Posture Commission emphasized the preservation of the U.S. nuclear triad; it offers considerable inherent flexibility, diversity and resilience.<sup>11</sup>
- Given the need for effective deterrence and the corresponding value of force flexibility, resilience and diversity, the United States should be most careful to avoid reductions and other restrictive measures that would lock in an undiversified and inflexible arsenal—whether done by treaty, executive agreement or unilaterally. Minimum Deterrence proposals for very low force numbers, the elimination of the triad, and a standing policy of no “new” U.S. capabilities are particularly onerous in this regard.
- The integrity of U.S. alliances and the preservation of U.S. non-proliferation goals likely depend on the credible U.S. assurance of allies, including nuclear assurances. Given these priority goals, the United States must understand the unique security challenges and fears of allies, and size and structure U.S. forces with the unique requirements of their assurance in consideration. Deterrence and assurance are separate but related functions and their requirements will frequently differ. Here, too, we should be most careful to avoid locking in an arsenal that is too narrow and inflexible to support both deterrence and the assurance of allies. U.S. advanced conventional forces and missile defenses may usefully complement U.S. nuclear forces for both purposes.
- Ample historical and contemporary evidence demonstrates that U.S. nuclear capabilities contribute uniquely to the assurance of at least some key allies. This assurance value of nuclear weapons is not subject to U.S. preference; it is a function of allied security concerns and felt needs. This assurance value of U.S. nuclear weapons should be taken into account in any calculation of U.S. nuclear force requirements and reductions. Minimum Deterrence proposals for deep force reductions, the elimination of the triad, the removal of non-strategic nuclear weapons from Europe, and a standing policy of no “new” capabilities, are particularly risky in this regard.
- The assertive Chinese posture in the South and East China Seas, and the emerging and prospective nuclear threats from North Korea and Iran, respectively, are such serious security concerns to Japan and South Korea, and to U.S. friends and allies in the Middle East, that the United States must consider anew how it can strengthen deterrence and assure these allies, including via revitalized approaches to extended nuclear deterrence.
- The functioning of deterrence is not predictable in detail, and in some plausible cases it will not work. This reality suggests the potentially great value of U.S. defensive

capabilities, including missile defense, to provide protection for U.S. society in the event deterrence fails. This goal, too, should be a factor in U.S. force-sizing calculations vis-à-vis at least some plausible threats.



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## I. Introduction: Minimum Deterrence

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*"Facts are stubborn things, and whatever may be our witness, our inclinations, or the dictate of our passion, they cannot alter the state of facts and evidence."*

*John Adams*

Proposals for a Minimum Deterrence policy have a long history in the United States. The common theme in such proposals is that, given the great lethality of nuclear weapons, few are needed to ensure the reliable, predictable functioning of deterrence. They typically assert that a relatively small number of survivable U.S. nuclear weapons, measured in single digits to hundreds, is an adequate nuclear force for all pertinent U.S. deterrence missions, including extending U.S. nuclear deterrence coverage to U.S. allies. A relatively small number of weapons typically is deemed adequate because even a small number of nuclear weapons can hold at risk an opponent's urban centers: "Deterrence based on the mutual vulnerability of U.S. and Russian urban centers can exist with relatively low numbers of strategic forces..."<sup>12</sup> How much is enough for deterrence?: The relatively small number of nuclear weapons necessary to threaten catastrophic damage to the opponent's society. This Minimum Deterrence theme is a variant of the classic Cold War notion of a balance of terror.<sup>13</sup>

The basis for most of the many confident Minimum Deterrence claims that U.S. deterrence requirements can be met with a small number of nuclear weapons is the vulnerability of civilian targets to a small number of nuclear weapons and the assumed high value of these targets to opposing leaders. Proponents of Minimum Deterrence often express great confidence that deterrence will function predictably on the basis of a threat to the opponent's civilian society and thus claim that such a threat is a proper measure of U.S. nuclear deterrence adequacy.

For example, "The possibility of even a few nuclear detonations in populated areas provides ample deterrence."<sup>14</sup> Or, as simply stated by the late Kenneth Waltz, past president of the American Political Science Association, "Not much is required to deter."<sup>15</sup> McGeorge Bundy, National Security Advisor to President John Kennedy, set forth the fundamental basis for this Minimum Deterrence position with his claim that: "In the real world of real political leaders—whether here or in the Soviet Union—a decision that would bring even one hydrogen bomb on one city or one's own country would be recognized in advance as a catastrophic blunder; ten bombs on ten cities would be a disaster beyond history; and a hundred bombs on a hundred cities are unthinkable."<sup>16</sup>

Minimum Deterrence proposals now occasionally include threats to a small, select set of military targets. But, whether the threat is to the opponent's society alone or includes a small set of military targets, the logic and promise are the same: proponents of Minimum Deterrence claim that the United States can reduce its nuclear arsenal to low or very low numbers without jeopardizing its deterrence goals or creating other insuperable risks. Correspondingly, Minimum Deterrence proposals typically call for the United States to reduce its nuclear arsenal to low or very low levels unilaterally or as part of an arms control process.

The purpose of reducing the U.S. nuclear arsenal per this Minimum Deterrence recommendation has varied somewhat over time. In many cases, the stated goal is simply “reducing nuclear danger.”<sup>17</sup> More specifically, proponents of Minimum Deterrence often argue that reducing to low force levels would:

- provide deterrence that is more “stable” and ensure greater safety than otherwise would be the case;
- facilitate nuclear arms control agreements and successful non-proliferation policies;
- provide substantial savings in the defense budget; and, more recently,
- help create the conditions necessary for a more peaceful world order and realize the goal of eliminating nuclear weapons entirely, i.e., “nuclear zero.”

In short, proponents claim that Minimum Deterrence provides the measure of nuclear requirements adequate for deterrence while also facilitating these stated goals.

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## II. Minimum Deterrence and U.S. Policy

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*"I hope that day comes. I hope that day comes soon. And when it does, I want to invite you all over to my house for a party. I'd just ask that you don't feed any of the hors d'oeuvres to my unicorn."*

*U.S. Air Force general officer, regarding global nuclear disarmament*

U.S. nuclear policies and deterrence strategies have historically rejected Minimum Deterrence as the proper measure of the adequacy of U.S. nuclear forces or their employment.<sup>18</sup> Secretary of Defense Robert McNamara's 1960s *declaratory* policies regarding a U.S. deterrence strategy based on "Assured Destruction" included some elements of Minimum Deterrence; he identified a U.S. punitive retaliatory threat to destroy specified percentages of the Soviet population and industry, i.e., "Assured Destruction," as an adequate measure for U.S. strategic nuclear forces for deterrence of attacks against the United States and for extending deterrence protection to allies.<sup>19</sup> Secretary McNamara argued publicly that the capability needed to back such a punitive retaliatory threat could be met with a U.S. arsenal sufficient to deliver 400 "equivalent megatons," and that additional U.S. offensive or defensive capabilities would be of little value (or, in fact, would be harmful to deterrence "stability" and efforts to slow the nuclear "arms race").<sup>20</sup>

According to McNamara, this Assured Destruction metric was useful for capping U.S. deterrence requirements, but did not actually describe how the U.S. approached the question of nuclear weapons employment—which certainly included the targeting of Soviet military capabilities.<sup>21</sup> However, the high visibility of Assured Destruction as declared deterrence policy led much of the attentive public to conclude that it and, subsequently, Mutual Assured Destruction (MAD), reflected the fundamental reality of U.S. nuclear doctrine.

Subsequent U.S. nuclear policy developments such as National Security Decision Memorandum (NSDM)-242 (the 1974 Schlesinger Doctrine), Presidential Directive (PD)-59 (the Carter administration's 1980 "Countervailing Strategy"), various changes to the Secretary of Defense Policy Guidance for the Employment of Nuclear Weapons (NUWEP), and the 1994 and 2001 Nuclear Posture Reviews all reportedly rejected Assured Destruction and Minimum Deterrence-type language and force-sizing metrics in favor of larger and more diverse measures of adequacy. These measures included multiple, flexible deterrence threat options, and "essential equivalence" with the Soviet Union.<sup>22</sup>

Following each of these policy developments, there was considerable criticism by Minimum Deterrence proponents that the U.S. was rejecting the goal of deterrence altogether and instead pursuing nuclear "war-fighting" strategies. These critiques typically were based on the belief, central to Minimum Deterrence, that a relatively small number of U.S. nuclear weapons is adequate for threatening civil targets and the only proper measure of U.S. strategic forces for deterrence. With such a narrow definition of deterrence, Minimum Deterrence proponents typically criticize any evolution of U.S. policy beyond their favored minimal measure of adequacy as the abandonment of deterrence altogether.

Although Minimum Deterrence has never been the overarching U.S. nuclear policy guide, various interested individuals and organizations have promoted a Minimum Deterrence policy direction since the 1950s. The following quotes are a small sampling of relatively recent Minimum Deterrence-related comments. They reflect the great confidence that Minimum Deterrence proponents have in their capability to predict that deterrence will work reliably at low or very low U.S. nuclear force levels now and in the future:

- “Deterrence today would remain stable even if retaliation against only ten cities were assured.”<sup>23</sup>
- “A total stockpile on the order of 500 warheads would satisfy the principal objectives of strategic nuclear deterrence in ‘rational’ scenarios where strategic deterrence is a useful concept.”<sup>24</sup>
- “Deterring Russia, as well as China and other states that have acquired nuclear weapons remains a justifiable function of U.S. nuclear weapons policy. But several thousand U.S. nuclear warheads are not needed to discharge that mission; a few hundred would suffice.”<sup>25</sup>
- “A ‘limited’ nuclear attack involving just 300 [U.S.] nuclear weapons could kill 75 million Russians immediately and millions more in the weeks and months to follow.”<sup>26</sup>
- “The United States needs relatively few warheads to deter China. A limited and highly accurate U.S. attack on China’s 20 long-range ballistic missiles would result in as many as 11 million casualties.”<sup>27</sup>
- “A few hundred warheads are more than adequate to serve as a deterrent against anyone unwise enough to attack the United States with nuclear weapons.”<sup>28</sup>
- “We estimate that a U.S. strategic force of some 500 operationally deployed warheads would be more than adequate for deterrence.”<sup>29</sup>
- “Deterrence would remain robust with far smaller arsenals on far lower levels of alert. The United States and Russia should aim to cut the numbers of their nuclear weapons to the low hundreds.”<sup>30</sup>
- “No sane adversary would believe that any political or military advantage would be worth a significant risk of the destruction of his own society...Thus ten to one hundred survivable warheads should be more than enough to deter any rational leader from ordering an attack on the cities of the United States or its allies.”<sup>31</sup>
- “Having 100 nuclear warheads...will deter others from using nuclear, biological, or chemical weapons or from even engaging in conventional attacks.”<sup>32</sup>
- “From a practical perspective, several second-strike nuclear weapons are more than enough to keep the most aggressive adversary at bay.”<sup>33</sup>

- “Rather fewer than 100 warheads is sufficient to inflict a wholly unacceptable level of damage on a continental-sized economy, and suggests that—even for the most enthusiastic proponent of nuclear deterrence—maintaining an arsenal at higher than that level is unnecessary.”<sup>34</sup>
- “The United States and the Soviet Union each has about 270 urban areas with a population of more than 100,000. Imagine what several hundred [nuclear] warheads could do to either country...We must recommit ourselves to a doctrine of assured retaliation...and we must reject the nuclear war-fighting doctrine.”<sup>35</sup>

As noted, there is a long history of Minimum Deterrence advocacy in the United States and a corresponding long history of U.S. officials rejecting Minimum Deterrence as the basis for U.S. policy. Most recently, however, the Obama administration has embraced the long-term goal of “nuclear zero,” and a near-term goal of further reductions by up to one-third of U.S. deployed strategic nuclear weapons, well below the deployed warhead and launcher ceilings set by the 2010 New START Treaty, i.e., 1,550 and 700, respectively.<sup>36</sup> Further reductions by one-third would keep U.S. warhead levels somewhat above the typical Minimum Deterrence range until any subsequent round of reductions. Some Minimum Deterrence proponents have proposed that the White House revise downward U.S. nuclear targeting requirements as an easy avenue for U.S. military commanders to affirm that fewer nuclear weapons are needed for their assigned missions.<sup>37</sup>

According to press reports, the administration’s “90-Day Report,” a review of U.S. nuclear targeting requirements requested by the White House for the self-expressed purpose of lowering U.S. nuclear force numbers, considered new warhead ceilings ranging from 300 to 1,100.<sup>38</sup> If so, these options clearly included force numbers that fall within the traditional range of Minimum Deterrence and are well below the ceilings established by the administration’s New START Treaty.

Finally, some senior U.S. officials and serving military officers have now openly expressed support for the basic points and recommendations of Minimum Deterrence.<sup>39</sup> In short, proposals for Minimum Deterrence have recently taken on greater visibility and possible policy significance as the appropriate U.S. deterrence strategy framework for the post-Cold War era and as a milestone en route to nuclear zero.

Despite the many past and contemporary proposals for Minimum Deterrence, there is no study that systematically examines its basic elements for consistency with available evidence and logic. Now with over six decades of history providing ample ground for careful examination, it is possible to subject Minimum Deterrence to systematic study. Given its apparent increasing policy salience to deterrence and U.S. force-sizing measures, such a study is imperative.





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### III. Minimum Deterrence: Assumptions, Logic and Conclusions

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*“There are two ways a theorist goes astray: 1) The devil leads him by the nose with a false hypothesis. (For this he deserves our pity) 2) His arguments are erroneous and sloppy. (For this he deserves a beating)”*

*Albert Einstein, 1915*

Given the increased visibility of Minimum Deterrence and its potential to shape forthcoming U.S. policy decisions, it is important to identify the fundamental assumptions, logic and related conclusions of contemporary proposals for Minimum Deterrence, and to examine their internal logic and consistency with available empirical evidence. Doing so will contribute to a more informed understanding of its possible value as the basis for U.S. post-Cold War nuclear force planning, posture and policy.

Contemporary advocacy suggests that Minimum Deterrence is a new strategy suitable for the new circumstances of the post-Cold War period. However, while the specific arguments put forth by Minimum Deterrence proponents have changed somewhat over time, their two basic themes have remained remarkably consistent for over five decades and reflect classic balance of terror thinking: (1) the United States needs few nuclear weapons for deterrence purposes; and (2) this modest requirement for deterrence should be the measure that determines the size and character of the U.S. nuclear arsenal.

Contemporary advocacy for Minimum Deterrence includes the following eight basic positions:

1. Deterrence, now and in the future, can be expected to function reliably and predictably against virtually any state at low or very low U.S. nuclear force levels.
  - a. U.S. advanced conventional capabilities can be a credible basis for deterrence, and in most cases can substitute for U.S. nuclear threats for deterrence purposes.
  - b. Threats against opponents' civil/societal assets or a small and select set of military assets constitute a credible U.S. deterrence threat. There is no deterrence requirement to hold a more comprehensive set of enemy military/counterforce targets at risk. This could be destabilizing.
  - c. Given the reliable, predictable functioning of deterrence, there is very limited need for defensive capabilities, particularly including national missile defense. Such capabilities can be destabilizing.
2. Russia and China are not now, and are unlikely to again become U.S. adversaries; U.S. nuclear deterrence and force-sizing considerations no longer need to take threats from these countries into account.

3. Nuclear weapons are irrelevant to the most pressing U.S. security threat, i.e., terrorism involving weapons of mass destruction (WMD).
4. U.S. strategic force-sizing can be determined via deterrence considerations alone as defined by Minimum Deterrence.
  - a. Assurance of allies imposes no unique nuclear requirements. Allies will increasingly be assured adequately by U.S. and allied conventional power projection forces and theater missile defenses. Thus allies will remain non-nuclear in the context of further U.S. nuclear reductions.
  - b. Substantial defenses for the United States (national defense), if deterrence fails, should not be a factor in U.S. calculations of strategic force requirements.
5. Ballistic missile submarines (SSBNs) will remain invulnerable for 30-50 years and are adequate for deterrence, thus other legs of the nuclear triad may be helpful but are unnecessary for deterrence or the assurance of allies. A small triad or even an SSBN-based monad will be sufficient because force requirements for deterrence are easily met and SSBNs are, and will remain, survivable.
6. There is a direct correlation between reducing the number of nuclear weapons and “reducing nuclear dangers,” i.e., more nuclear weapons means greater dangers of nuclear war, accidents and theft; fewer nuclear weapons means reduced dangers.
7. Declaring nuclear weapons to be of very limited continuing salience and correspondingly establishing a low or very low ceiling for U.S. nuclear requirements facilitates nuclear non-proliferation and momentum for arms control by providing a positive U.S. example of devaluing nuclear weapons (“lead by example”).
  - a. The reduction of U.S. nuclear forces is demanded by the Non-Proliferation Treaty and will strengthen U.S. non-proliferation efforts, which is the top U.S. security priority; non-proliferation success depends on continuing reductions in U.S. nuclear capabilities.
  - b. U.S. force developments are the decisive impetus behind force developments by prospective opponents. Thus U.S. initiatives to reduce the roles and numbers of nuclear weapons will help lead to greater global support for non-proliferation goals (“isolate” rogues, establish global norms, etc.).
8. The reduction of U.S. nuclear forces will save many billions of scarce U.S. defense dollars.

The Obama administration’s expressed policy positions undergirding its nuclear policies and initiatives for nuclear reductions, implicitly or explicitly reflect some, but not all of these eight Minimum Deterrence points.<sup>40</sup> Particularly apparent in this regard is the presumed ability to predict with confidence and precision how deterrence and extended deterrence will work at much lower U.S. nuclear force levels.

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## IV. Examining and Testing the Fundamental Assumptions and Logic of Minimum Deterrence

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*“It is not at all clear that reducing strategic forces would increase stability... The burden of proof should be on those who advocate such reductions to demonstrate exactly how and why such cuts would enhance security.”*

*Brent Scowcroft and Arnold Kanter*

Over the decades, not all proposals for Minimum Deterrence have included each of the eight elements listed in Section Three above. Several are of more recent vintage. But, a systematic examination of contemporary Minimum Deterrence advocacy reveals that these elements, implicitly or explicitly, are part of the overarching Minimum Deterrence narrative. Each is described here, along with an examination of its consistency with available empirical and historical evidence.

### **1. Deterrence will function reliably and predictably at low U.S. nuclear force numbers, now and in the future.**

As already noted, the fundamental recommendation of Minimum Deterrence proponents is that the United States move to a deployed nuclear force level that ranges from a few weapons to hundreds. The functioning of deterrence is deemed predictable with this force because even a small number of U.S. nuclear weapons represents a retaliatory threat of “catastrophic” consequences,<sup>41</sup> and all rational leaderships will be deterred by such a threat of nuclear retaliation, now and in the future.<sup>42</sup> Consequently, proponents of Minimum Deterrence claim that low nuclear force levels should be the measure of adequacy for deterrence and the U.S. nuclear arsenal.<sup>43</sup>

U.S. capabilities intended to threaten large numbers of an opponent’s military capabilities, including its nuclear forces (“counterforce” target sets), typically are deemed unnecessary for and even detrimental (“destabilizing”) to U.S. deterrence strategies and generally are excluded from Minimum Deterrence definitions of U.S. force requirements:<sup>44</sup> “A true minimal deterrence mission has no need for a capability to attack enemy nuclear forces, hardened facilities, or underground structures, and certainly not to do it promptly.”<sup>45</sup> Rather, the capability to threaten an opponent’s cities (or a small and select set of military targets) and the corresponding modest numbers of U.S. nuclear forces are deemed adequate for deterrence. Political and military conditions have changed dramatically over the decades, but this fundamental Minimum Deterrence policy prescription has remained the same: the United States should move to low or very low numbers of nuclear weapons because this is an adequate basis for deterrence.

In contrast, the number of opponents’ military targets (including non-nuclear, nuclear, chemical and biological weapon sites) could be quite large, especially for peer and near-peer adversaries. Thus, including such “counterforce” targeting plans as part of U.S. force-sizing calculations

could easily lead to a U.S. nuclear arsenal much larger than recommended by Minimum Deterrence.

Minimum Deterrence also rejects significant U.S. capabilities to defend U.S. population centers because such defensive capabilities also are said to “destabilize” deterrence: they could undermine an opponent’s confidence in the effectiveness of its own deterrent, and thus cause it to consider a preemptive strike against the United States in a crisis.<sup>46</sup> Consequently, Minimum Deterrence proposals typically argue against U.S. movement toward significant U.S. “area” defensive capabilities.

A relatively recent addition to this Minimum Deterrence narrative is the proposition that U.S. nuclear capabilities are of limited and declining value for deterrence, in part because U.S. advanced conventional forces can help provide credible deterrent effect.<sup>47</sup> As one prominent Minimum Deterrence proposal asserts:

‘Extended deterrence’ does not have to mean ‘extended nuclear deterrence.’ United States conventional capability, when combined with that of each of the allies in question, constitutes a deterrent to any conceivable aggressor at least as credible as that posed by its nuclear weapons.<sup>48</sup>

As a result, the Minimum Deterrence claim again is that the U.S. can reduce the number of its nuclear arms without jeopardizing deterrence.

In these related Minimum Deterrence claims about deterrence, numerous specific expectations regarding opponent decision making and behavior are inherent, but rarely made explicit.

Deterrence will work because opponents will:

- understand U.S. threats and communications;
- value greatly the types of targets the U.S. threatens;
- link the U.S. threat to some specific act it must not undertake;
- make decisions per an informed and reasonable calculation of estimated costs and benefits;
- not be driven by some internal or external imperative to act despite the U.S. deterrent;
- believe to some degree that the United States will execute its threat if the opponent does not comply with the U.S. demand, and that the United States will not do so if it does comply;
- fear the U.S. threat more than they fear conciliation over any issue in dispute;
- deem conciliation to be a tolerable act;
- have positive control over its own actions and forces; and,
- be deterred from severe provocation by U.S. nuclear threats limited to a relatively small set of targets.

These expectations presume that all rational state leaderships now and in the future will adhere to near-universal decision-making norms and thus respond in the same way to U.S. Minimum Deterrence-type threats: they will calculate their interests predictably and decide to be deterred.<sup>49</sup> It is on the basis of this presumption of similar decision making and behavior that Minimum Deterrence proposals confidently claim that deterrence will function at their preferred

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low nuclear force levels. If opponents diverge from any element of this supposedly universal script, confident promises about the functioning of deterrence become implausible.

It is possible to test the Minimum Deterrence presumption that virtually all opponents will reliably follow this common decision-making and behavioral script in response to U.S. deterrence threats. This presumption can be examined against actual historical evidence of leadership decision making and cognitive studies of decision making.

### **Stubborn Facts**

Despite Minimum Deterrence claims that opponent decision making will follow a predictable, universal script, the reality is that such claims cannot be made credibly. There are inherent and often large uncertainties with regard to if and how deterrence might work. Predicting accurately how a set of leaders will respond at an unknown future date, in unknown circumstances, in a contest of wills over unknown stakes, is well beyond any human capacity. If past experience is any indication of the future, some leaders will easily be deterred, while others will be too foolish, uninformed or misinformed, or they will be zealots committed to a goal even if the cost and risk is exceedingly high.<sup>50</sup> Historical experience demonstrates conclusively that the functioning of deterrence is impossible to predict with the confidence typical of Minimum Deterrence statements (as illustrated on pages 4-5 above).

As noted, the fundamental argument for Minimum Deterrence is built on the promise that deterrence will function reliably at very low force levels, i.e., that “not much is required to deter.”<sup>51</sup> Yet the great variation in leaders’ perceptions of the world, goals, values, motivations, calculations of risks, prudence or recklessness, cultural norms, and modes of decision making precludes credible promises that deterrence will function predictably at some specified force level. The capacity of even the most astute human observers in this regard is woefully limited because the factors that can drive a leadership’s decision making often are opaque to external observers—and for a future leadership, they may be entirely obscure. In truth, Minimum Deterrence proponents cannot estimate with any reliability even the probability that their promises about deterrence will prove true in practice. The most that may be said in support of Minimum Deterrence promises is that, “if decision makers are ‘sensible,’ peace is the most likely outcome.”<sup>52</sup> But, of course, there is no universal definition of what is “sensible.” Many past U.S. opponents have not shared the Western definition; some have acknowledged that fact and been proud of it.<sup>53</sup>

Studies of human cognition and behavior provide evidence of great variability in human decision making. In particular, many factors can contribute to the behavior of humans in high-stakes situations. Among the human population there exists considerable natural variation in brain function.<sup>54</sup> Geneticists have documented the scientific evidence of the diversity of the DNA that controls the development and function of the human brain, and neurologists report empirical evidence of differences in cognitive functioning. In addition, many other factors can affect brain function and cognition. These factors include: genetic diversity; obstacles to cognition (i.e., the process of knowing), including disease, injury, drugs, hormones and emotion; and pathologies that form within groups. And, during periods of tension and stress, there exists the great potential for misperception, miscalculation and miscommunication. Cumulatively, evidence from studies of cognition demonstrates that there is enormous variation in the process of human

decision making. As a result, we should be skeptical of any confident claims that adversary decision making will follow any set script predictably in response to U.S. deterrence threats.<sup>55</sup>

The U.S. intelligence community well knows that predictions about foreign decision making and behavior is a risky business, often because our own cultural blinders prevent us from understanding the world as our opponents understand the world. As George Tenet, former Director of Central Intelligence observed, “What we believe to be implausible often has nothing to do with how a foreign culture might act.”<sup>56</sup> The Obama administration’s former Director of Central Intelligence and Defense Secretary, Leon Panetta, noted similarly, “Our biggest problem is always how do we get into the head of somebody... Those are the kinds of things that are obviously very tough for intelligence to predict,”<sup>57</sup> and, with reference to North Korea, “who the hell knows what they’re going to do?”<sup>58</sup> Or, as James Clapper, the Director of National Intelligence said more simply, “We are not clairvoyant.”<sup>59</sup> As a result, observes Army Maj. Gen. Herbert McMaster, “We have a perfect record in predicting future wars—right? ...And that record is 0 percent.”<sup>60</sup> Predicting if and how deterrence will function in any detail is comparably challenging.

Minimum Deterrence proponents typically make confident and near-universal promises about deterrence working without any apparent recognition of the great variation possible in opponent decision making and the resultant fragility of their confident claims about deterrence working at their preferred low force levels. Their analyses also lack any apparent detailed studies of actual leaderships on which to base an understanding of how opponents are likely to make decisions and behave. They simply assume the universality of the conditions and decision-making norms necessary for deterrence, and thus make confident predictions of its functioning.<sup>61</sup> Yet, historical evidence consistently illustrates the fallacy of that assumption: on important occasions, leaders have not adhered to the presumed universal script.

For example, in 1945, following the atomic attack on Hiroshima and in pursuit of his vision of national honor, the Japanese war minister, Korechika Anami, sought the continuation of the war even if it meant the destruction of Japan.<sup>62</sup> In 1958, Mao Zedong ordered a massive shelling of the small island of Quemoy for the purpose of eliciting US nuclear threats. He later wrote to Soviet leader Nikita Khrushchev that he, “would be only too happy for China to fight a nuclear war with America alone. ‘For our ultimate victory,’ he offered, ‘for the total eradication of the imperialists, we are willing to endure the first strike. All it is a big pile of people dying.’”<sup>63</sup> In 1962, Nikita Khrushchev moved nuclear weapons to Cuba despite his expectation that, as a consequence, “they can attack us and we shall respond. This may end in a big war.”<sup>64</sup> During the same crisis and in an expression of ideological fervor, the Cuban leadership demanded that the Soviet Union launch a nuclear attack against the United States despite its recognition that the consequences would be a horrific war and the destruction of Cuba.<sup>65</sup> In 1973, to restore national honor, Egypt and Syria launched a massive armored attack against Israel, despite the putative risk of Israeli nuclear retaliation.<sup>66</sup> And, in 1982, the Argentinean leadership invaded and occupied the British Falkland Islands, disregarding the risk of possible nuclear escalation involved in attacking a known nuclear power.<sup>67</sup>

The confident Minimum Deterrence promises about the reliable and predictable functioning of deterrence now and in the future literally ignore this and much more evidence from history that demonstrates the fallacy of the proposition that leaders will predictably follow the presumed decision-making script.<sup>68</sup> These historical cases do not suggest that deterrence is

unimportant—to the contrary, it has prevented war and wartime escalation in the past. They do, suggest, however, that implicit Minimum Deterrence claims about decision making, and corresponding explicit claims about deterrence working at very low U.S. force levels are not credible.

### ***Some Evidence From History***

Promises of the reliable and predictable functioning of deterrence at low force levels appear to ignore the overwhelming evidence from history that the functioning of deterrence is not so predictable. Nevertheless, in some past cases it is possible to demonstrate that nuclear deterrence helped to prevent war and the escalation of conflict. For example, a close examination of Soviet Politburo records in 1948 and 1949 demonstrate that U.S. nuclear capabilities were, “the single most important factor which restrained Stalin’s possible temptation to resolve the Berlin problem by military means. Evidence obtained from [Soviet] oral history clearly supports this fact.”<sup>69</sup> After Khrushchev risked moving nuclear weapons to Cuba in 1962, President Kennedy compelled him to withdraw them. In this case, while U.S. naval and air superiority around Cuba probably helped shape Soviet decision making, Soviet strategic nuclear “inferiority appears to have had a profound effect on [Soviet] behavior in this crisis.”<sup>70</sup> India’s former army chief, Gen. Shankar Roychowdhury, explained that “Pakistan’s nuclear weapons deterred India from attacking that country after the Mumbai strikes” and, “It was due to Pakistan’s possession of nuclear weapons that India stopped short of a military retaliation.”<sup>71</sup> And, the most informed analyses of available evidence indicate that Saddam Hussein was deterred from the use of chemical and biological weapons in 1991 by the apparent U.S. nuclear threat.<sup>72</sup> Other non-nuclear threats appear not to have been so powerful.

Multiple historical cases suggest that, at least on occasion, nuclear weapons can contribute uniquely to deterrence success because their presence can make the risks of provocation appear incalculable and uncontrollable to an aggressor.<sup>73</sup> Some recent anthropological studies suggest the same.<sup>74</sup> This nuclear deterrent effect may otherwise be difficult or impossible to establish. A cursory review of the motives and perspectives of some leaderships in the post-Cold War period suggests that this dynamic is why “conventional deterrence is likely to be less reliable than nuclear deterrence.”<sup>75</sup> Evidence supports then-Commander of U.S. Strategic Command (STRATCOM) General Kevin Chilton’s observation in 2010 that, “The nuclear weapon has a deterrent factor that far exceeds a conventional threat.”<sup>76</sup>

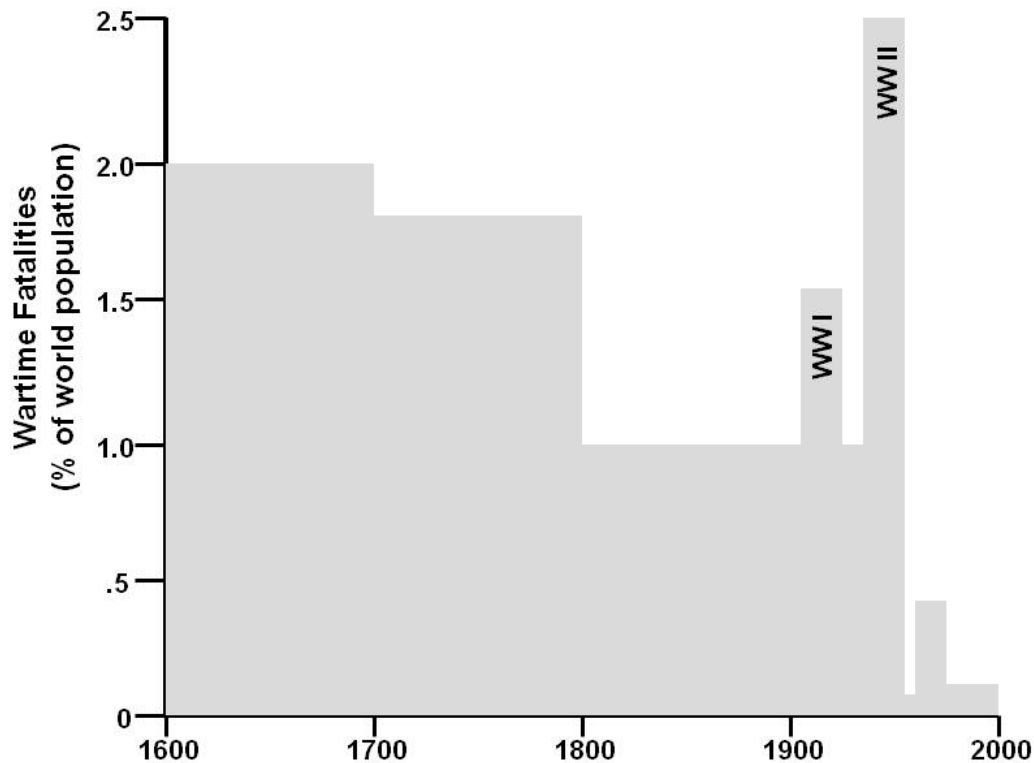
Historical case studies do not indicate that nuclear deterrence is infallible or that conventional forces cannot be adequate for deterrence in some cases. They do, however, demonstrate that nuclear weapons have contributed uniquely to deterrence effectiveness in the past.

This value of nuclear weapons for deterrence also is suggested (not “proven”) by the absence of major great power wars and a related dramatic decline in the percentage of wartime deaths since the advent of nuclear weapons and nuclear deterrence, as is illustrated by Figure 1. In contrast, the history of conventional deterrence is one of some success, and some catastrophic failures. The roughly 110 million casualties during little more than ten combined years of fighting in World Wars I and II should serve as a reminder of what appears to have been prevented since—at least in part by nuclear deterrence. A comparable level of international conflict today in the absence of effective nuclear deterrence would likely involve casualty levels



many times higher than those of the twentieth century—even if conventional forces alone were employed.

**Figure 1. Strategic Deterrence—A Transformation in Warfare**



Source: Adm. Richard Mies, USN (ret.), "Strategic Deterrence in the 21<sup>st</sup> Century," *Undersea Warfare* (Spring 2012). Presented here with permission.

In short, the historical record and cognitive studies indicate strongly that Minimum Deterrence promises of deterrence functioning reliably and predictably at dramatically-reduced nuclear force levels are insupportable. The historical record also suggests that nuclear weapons may, on important occasions, contribute uniquely to deterrence. The key question then is: are there nuclear force characteristics and levels likely to help deterrence work as effectively as is possible?

### ***Minimum Deterrence: New Deterrence Thinking for a New Age?***

Harold Brown, Secretary of Defense in the Carter administration, and James Woolsey, Director of Central Intelligence in the Clinton administration, have made the fundamental point that U.S. deterrence threats should hold at risk those assets most valued by opposing leaderships because opponents must fear the U.S. deterrent more than they desire any goals that could otherwise lead them to aggression.<sup>77</sup> The logic of this point is unassailable.

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Those most-valued assets to be held at risk for U.S. deterrence purposes in the contemporary dynamic threat environment will be as variable and diverse as is the spectrum of opposing leaderships to be deterred and the contexts within which they must be deterred. This is an important point because the post-Cold War environment is a kaleidoscope of technological and geopolitical change, with shifting, emerging and surprising threats to drive U.S. deterrence threats and requirements.<sup>78</sup> As Director of National Intelligence James Clapper recently observed, "In almost 50 years in intelligence, I don't remember when we've had a more diverse array of threats and crisis situations around the world to deal with."<sup>79</sup>

Given this diversity of threats and prospective crisis situations, in some cases U.S. non-nuclear or even non-military power may be adequate to provide the needed deterrent; in other cases, diverse types and significant numbers of U.S. nuclear forces may be necessary for effective deterrence threats. For example, an opponent may place highest value on its instruments of state power and its own survival. The number and type of U.S. capabilities necessary to threaten such assets credibly could be far beyond that recommended by Minimum Deterrence, especially if that opponent has taken steps to protect itself against U.S. deterrence threats.

Similarly, in the post-Cold War international environment, the United States may need to deter multiple opponents simultaneously, including Russia, China, North Korea, and prospectively a nuclear-armed Iran and other state sponsors of terror. This list will evolve and possibly expand over the course of time. Again, the number and diversity of U.S. nuclear capabilities needed to hold all of their respective most highly-valued assets at risk for deterrence purposes could easily surpass the relatively small, fixed arsenals envisaged under Minimum Deterrence. Those assets may be as diverse as is the list of opponents, and identifying them almost certainly will include an inherent degree of uncertainty. In this context, no one can claim with any credibility to know that some fixed and relatively small set of U.S. nuclear capabilities will be adequate to deter, now and in the future, a diverse and dynamic list of opponents.

In addition, in those possible future cases where the United States and allies face an opponent with great local conventional force superiority (possibly abetted by chemical and biological weapons), it will be the United States and allies that must confront the aggressor with the threat of nuclear escalation, or suffer a great local defeat. It is far from clear that in such a case the narrow options available with a Minimum Deterrence nuclear arsenal could support credible U.S. deterrence threats of nuclear escalation.

The assets of an opponent that need to be held at risk for deterrence may be known in advance and accessible; in other cases, it may not be possible to know far in advance the character and values of the opponent and, correspondingly, the types of assets that need to be held at risk for deterrence or the U.S. capabilities necessary to pose that threat. For deterrence to be as effective as possible in such a dynamic threat environment, U.S. deterrence capabilities optimally will be as flexible and diverse as necessary to adapt to shifting opponents, threats and circumstances.<sup>80</sup> U.S. forces that are flexible and diverse will contribute to the U.S. capability to adapt deterrence threats and strategies in a highly-dynamic and uncertain threat environment. The more diverse and flexible are our forces, the more likely we are to have the variety of capabilities that may be needed for deterrence in a time of shifting and uncertain threats, stakes and opponents. As noted, Minimum Deterrence proponents claim confidently that a low number of nuclear weapons of existing types will be adequate for deterrence now and in the future. In a static threat environment, these claims might be plausible; but truly static threat environments

are rare and in today's highly-dynamic context, such claims are likely to be wholly misleading—suggesting knowledge where there is instead hope and speculation.

Pointing to the value of flexible and diverse forces for deterrence is not new or radical: the drive for such nuclear qualities to help deter a spectrum of possible severe threats with the forces most suitable for the occasion has been the primary thrust of U.S. nuclear policy developments for decades, under both Democratic and Republican administrations.<sup>81</sup> This great deterrence value of having flexible capabilities that can be adapted to diverse threats is magnified—*not lessened*—by the contemporary dynamic, uncertain threat environment. The fundamental need for U.S. forces to be flexible and resilient is emphasized consistently by the commanders of Strategic Command,<sup>82</sup> the final report of the bipartisan Congressional Commission on the Strategic Posture of the United States,<sup>83</sup> and senior officials in the Obama administration.<sup>84</sup> The Obama administration's own 2010 *Quadrennial Defense Review Report* makes the point more broadly: "The second theme to emerge from QDR analyses is the importance of ensuring that U.S. forces are flexible and adaptable so that they can confront the full range of challenges that could emerge from a complex and dynamic security environment."<sup>85</sup>

This policy thrust is intended to enable American presidents to deter a potentially diverse range of severe provocations, now and in the future, as effectively as possible with the type of U.S. threat that is best suited for the deterrence goal at hand. The deterrence advantage of diverse forces and adequate numbers to do so, as opposed to narrow and smaller forces, is precisely in the greater flexibility, resilience and adaptability provided by a larger and more diverse arsenal. As Adm. Richard Mies, former commander of the Strategic Command, observes in this regard, "There is a tyranny in low [strategic] platform numbers that greatly restricts the flexibility, survivability and resiliency of the force."<sup>86</sup> Retaining these characteristics that may be key to deterrence working is the primary reason the bipartisan Strategic Posture Commission recommended in its 2009 final report that the United States maintain the triad of strategic forces:<sup>87</sup> the triad has been a source of flexibility and resilience. The potential advantage of larger, diverse forces, and their corresponding greater lethality, flexibility and adaptability, may help explain why superior nuclear force numbers appear historically to have been a key to deterrence success in nuclear crisis outcomes.<sup>88</sup>

The importance of U.S. nuclear force flexibility and diversity for both extended deterrence and the assurance of allies is fully recognized by key allies who depend on the U.S. nuclear umbrella for their security. For example, in 2010, Japan's National Defense Program Guidelines emphasized that the U.S. extended nuclear deterrent is "indispensable."<sup>89</sup> More recently, a senior Japanese representative stated that the role of nuclear weapons in extended deterrence should not be downplayed, and that in a "very complex" security environment, "extended deterrence needs to cater to vast scenarios and varying degrees of escalation... we need a toolkit to respond to all their complex challenges."<sup>90</sup>

France, with its independent nuclear forces and deterrent, fully recognized this link between the dynamic contemporary threat environment and the requirements for flexible and diverse nuclear forces to support deterrence. The 2008 French White Paper says with regard to nuclear deterrence: "Given the diversity of situations to which France might be confronted in an age of globalisation, the credibility of the deterrent is based on the ability to provide the President with an autonomous and sufficiently wide and diversified range of assets and options."<sup>91</sup> Precisely so.

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The Department of Defense has committed to fielding “nuclear forces that can under any circumstances confront an adversary with the prospect of unacceptable damage, both to deter potential adversaries and to assure U.S. allies.”<sup>92</sup> That ambitious commitment, however, may be impossible to meet at the very low force levels, greatly restricted U.S. threat options, and the narrow targeting plans possible with Minimum Deterrence.

This conclusion does not mean that there is no possible margin for adjustment of U.S. force numbers. But, the proper measure of U.S. deterrence requirements is not a question simply of having a fixed number and set of nuclear weapons. Rather, it is the more complex question of having the necessary numbers and the diversity of weapons, launchers and threat options to adapt U.S. deterrence strategies to diverse and shifting threats, circumstances and opposing leaderships. If the future was static and predictably benign, it might be clear that U.S. deterrence requirements could be satisfied with the much reduced U.S. force flexibility and resilience available at very low, static force levels. But, of course, the future is not so predictable.

In short, in many plausible contingencies, effective deterrence could demand a larger and more diverse nuclear arsenal than is envisaged for Minimum Deterrence. For deterrence to function effectively in these cases could be a high priority because the consequences of a single deterrence failure could be catastrophic.

### ***Threats to Civilian Centers?***

A final important consideration regarding the adequacy of a much smaller arsenal of limited diversity is the constrained set of deterrence targeting options that are plausible with a small arsenal. As already noted, most Minimum Deterrence proposals explicitly or implicitly posit that threatening an opponent’s urban centers or other civilian targets is the appropriate basis for U.S. deterrence strategies and measure of U.S. requirements. This notion of U.S. targeting was the basis for much of the early Cold War academic discussion of deterrence. For example, a classic text on the subject asks: “Would the Soviets be deterred by the prospect of losing ten cities? Or two cities? Or fifty cities? No one knows, although one might intuitively guess that the threshold is closer to ten than to either two or fifty.”<sup>93</sup> Note that the only apparent question is the number of cities to be threatened with destruction, not if an opponent’s cities are the proper targets to be threatened for deterrence. Technological limitations in U.S. nuclear forces in those early days, including their relatively poor accuracy, may have suggested deterrence threats to large soft targets, such as cities. But, those technological limitations no longer exist. Nevertheless, Minimum Deterrence typically continues this early Cold War focus on targeting an opponent’s civilian centers (“countervalue” targeting) as the basis for deterrence.

The problems with this approach to deterrence for the United States are severe—which explains why it has been rejected by Democratic and Republican administrations for four decades.

First, intentionally targeting an opponent’s civilian population for annihilation in response to the decisions by a leadership for which that population has no responsibility and possibly no sympathy has long and understandably been regarded as highly immoral. It certainly is in flagrant violation of the Just War tradition and correspondingly is illegal under international law, as is recognized by the United States.<sup>94</sup>

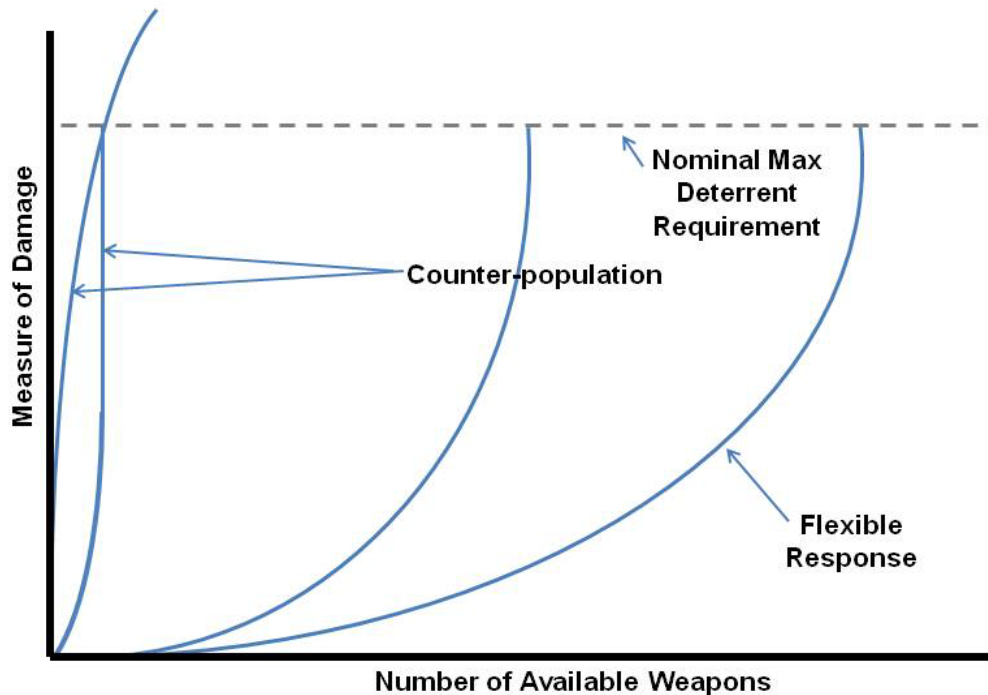
Minimum Deterrence proponents often respond to this point with the claim essentially that nuclear targeting inherently threatens large-scale civilian casualties and thus Minimum Deterrence is no more vulnerable to these moral and legal problems than are other approaches to nuclear deterrence targeting.<sup>95</sup> That claim is highly dubious. The level of civilian casualties that would follow from targeting plans that specifically and intentionally threaten an opponent's cities would likely be many times higher than from plans that specifically and intentionally seek to limit civilian casualties and focus instead on other types of targets for deterrence purposes.<sup>96</sup> These latter approaches to targeting may require a larger and more diverse U.S. arsenal than is recommended by Minimum Deterrence, but they clearly are more consistent with well-recognized moral and legal strictures.

Second, some opponents may judge U.S. deterrence threats to destroy their civilian centers to be incredible given U.S. democratic values and frequent manifest U.S. efforts to limit to the extent possible the civilian destruction associated with U.S. military actions. Perhaps more importantly, for opposing leaderships eager to find a rationale for the belief that they can escape U.S. deterrence threats, doubts about the credibility of U.S. countervalue targeting threats may give them that margin of felt freedom to pursue provocations that they otherwise would consider high risk.

Third, intentionally responding against an opponent's cities following the failure of deterrence could remove any incentives the opponent otherwise would have to avoid U.S. cities in its counter-reply with its remaining forces. If deterrence fails, and the United States avoids an opponent's cities in its response to an attack, that opponent may in turn work to avoid striking U.S. cities—not from any sense of altruism, but from its own self-interest. Avoiding the targeting of an opponent's cities in a U.S. response to the failure of deterrence may not only be a more moral and legal approach to deterrence planning, it may help to establish mutual incentives to avoid city targeting during a conflict. It certainly is true that such self-interested restraint may not hold if deterrence fails, but responding against an opponent's cities could ensure a similar counter-reply. U.S. deterrence threats should not maximize the prospects for the mutual destruction of societies by leading the process if deterrence fails.

In short, Minimum Deterrence recommendations for a very limited U.S. arsenal would create inherent pressures toward the targeting of opponents' cities, as is illustrated in Figure 2 below. Yet, this approach to deterrence targeting, while compatible with the low number of weapons advocated by Minimum Deterrence, is uniquely illegal and immoral, likely not to be a credible deterrent on plausible occasions, and could easily undercut efforts to limit the destruction of civilian targets in the event deterrence fails. The thrust of U.S. policy development for decades has been to provide the president with greater flexibility and more response options to help strengthen deterrence and limit escalation if deterrence fails. In contrast, Minimum Deterrence would narrow options and reduce flexibility.

Figure 2. The Strategic Targeting Doctrine Dilemma



Source: Adm. Richard Mies, USN (ret.), "Strategic Deterrence in the 21<sup>st</sup> Century," *Undersea Warfare* (Spring 2012). Presented here with permission.

Force diversity and flexibility to avoid narrow U.S. deterrence threat options does not come automatically: U.S. capabilities must be sufficiently large and resilient to adapt to a variety of shifting deterrence demands. Yet, Minimum Deterrence would move the United States in the opposite direction. Indeed, the entire thrust of Minimum Deterrence is to restrict, reduce and narrow U.S. nuclear force options, flexibility and resilience. The expressed goal is to reduce significantly the number of U.S. nuclear weapons, thus effectively reducing their diversity and narrowing the targeting options available to a president. In a highly-dynamic nuclear threat environment, this goal, if realized, risks degrading the U.S. ability to deter war, increasing the prospects for the escalation of a conflict, and could move the United States toward "countervalue" targeting—with all its considerable weaknesses.

### **No "New" Capabilities**

A contemporary theme of Minimum Deterrence and U.S. policy is that the United States pursue a no "new" nuclear capabilities policy—with the goal of encouraging nuclear non-proliferation globally. This Minimum Deterrence policy implicitly or explicitly posits that no new capabilities will be necessary for deterrence now or in the future because, "We have more than enough capacity and capability for any threat that we see today or might emerge in the foreseeable future."<sup>97</sup>

Such a policy is inconsistent with U.S. possession and modernization of flexible and diverse capabilities as may be necessary to adapt to changing deterrence requirements. No evidence or logic permits the conclusion that existing U.S. nuclear options will meet future deterrence

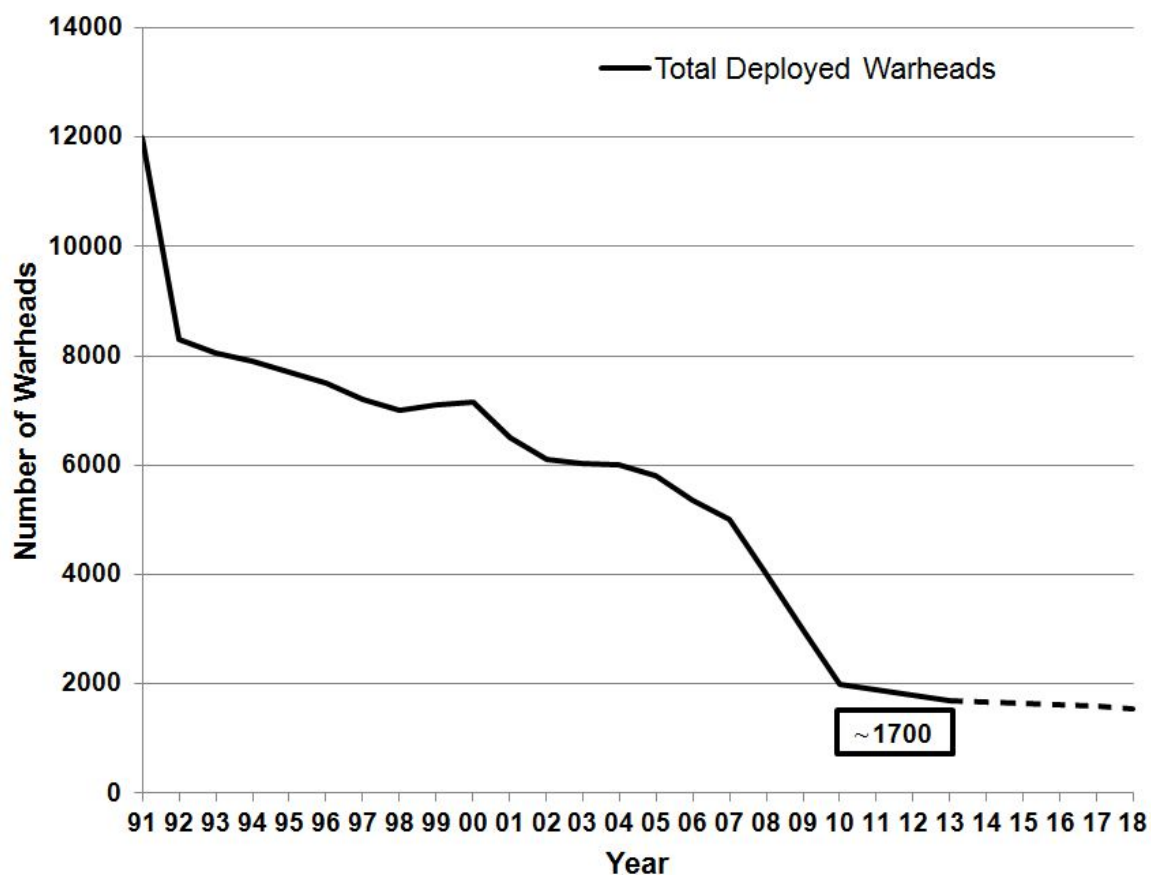
requirements: those requirements will shift with new opponents, leaderships, circumstances and changes in adversaries' capabilities. Again, the stubborn fact is that in a dynamic security environment, there is no basis for the claim that a very low and static set of U.S. nuclear capabilities will deter now or in the future.

### ***Deep Reductions via Arms Control***

In addition, Minimum Deterrence's recommendation of much lower nuclear forces inevitably is presented as a key step in an arms control process. The goal is to create the basis for further deep nuclear reductions and restrictions, with subsequent negotiations leading to ever-lower numbers and greater restrictions that are "legally-binding."<sup>98</sup>

There may indeed be room for prudent force adjustments, including reductions, depending on the threat environment; the collapse of the Soviet Union understandably led to deep reductions in the U.S. nuclear arsenal. As Figure 3 illustrates, the number of U.S. deployed strategic nuclear weapons already has been reduced by over 85 percent since the Cold War.

**Figure 3. The Reduction of U.S. Nuclear Weapons**



Source: Graph based on Lt. Gen. James M. Kowalski, "To Deter and Assure," Air Force Global Strike Command, May 7, 2013, slide #2, available at <http://www.fas.org/programs/ssp/nukes/nuclearweapons/AFGSC-CommandBrief-May2013.pdf>.

Locking in further deep reductions via “legally-binding” arms control restrictions could correspondingly further reduce the flexibility and resilience of U.S. forces to meet current or future deterrence demands. In a highly-dynamic environment, locking in further deep force level reductions via arms control, including the elimination of one or more legs of the triad, could easily lead to U.S. forces and planning that are, at least on occasion, too limited and inflexible for effective deterrence,<sup>99</sup> and create legal barriers that effectively preserve that high-risk condition for years. Minimum Deterrence proposals explicitly deny this risk with the presumptions of a future that essentially is static and a fixed deterrent that will work reliably.<sup>100</sup> Yet, such presumptions, in a highly-dynamic threat environment almost certainly are mistaken.

A small, undiversified, Minimum Deterrence force:

- would offer fewer choices among warheads and delivery modes, thereby limiting U.S. flexibility and the prospective effectiveness of U.S. deterrence strategies;
- is less likely to compensate for weaknesses in one area of our nuclear force structure by strengths in another area;
- will inevitably move U.S. deterrence strategies toward narrow targeting options against civilian-based targets and/or against a small, select set of military targets.<sup>101</sup> Such threats may well be inadequate and/or incredible for some deterrence purposes;
- will ease the technical/strategic challenges for opponents who might seek to counter our deterrence strategies and static military capabilities, now or in the future;
- may encourage, rather than deter, some opponents from arms competition and challenges to our deterrence strategies; and,
- will render U.S. deterrence forces more vulnerable to an opponent’s covert deployments or cheating on arms control agreements in the absence of significant U.S. hedging measures and/or wholly unprecedented and intrusive verification measures. As Henry Kissinger and Brent Scowcroft have observed in this regard, “Excessively low numbers could lead to a situation in which surprise attacks are conceivable.”<sup>102</sup>

### ***How Much Is Enough?***

What number of U.S. forces is compatible with the critical U.S. flexibility and adaptability suitable for deterrence in a dynamic threat environment? The answer essentially depends on the level of risk that is deemed acceptable in this regard. There is no “magic number” that ensures deterrence, but higher numbers with greater diversity should lessen the risk that deterrence will fail for lack of needed flexibility and resilience. As numbers and diversity are reduced, this risk increases. In 2001, the Bush administration judged 1,700-2,200 operationally deployed warheads with essentially no limit on the number of launchers to be sufficient.<sup>103</sup> In 2010, Gen. Kevin Chilton, commander of Strategic Command, stated in testimony before the Senate that the 1,550 deployed warhead ceiling of the New START Treaty was the lowest level he could endorse given this need for flexibility.<sup>104</sup> There has been no apparent great benign



transformation of international relations since these estimates to suggest that flexibility is now less important for deterrence or that lower force levels are now adequate for this purpose.

Even in the immediate afterglow of the Cold War's ending—when there was much serious expectation of a more amicable “new world order”—Walter Slocombe, President Clinton's Under Secretary of Defense for Policy, emphasized the continuing need to preserve nuclear force flexibility and diversity, and multiple targeting options. He suggested that maintaining 2,500 “highly survivable and flexible” strategic nuclear weapons would be adequate for that purpose.<sup>105</sup> He also highlighted the need to maintain such strategic force qualities and capabilities given the possibility of a “Russian relapse” to “a nationalist and authoritarian regime in the Kremlin.”<sup>106</sup> This caution now seems prescient.

Minimum Deterrence claims of effective deterrence at very low force levels appear to ignore the reality that the credibility and effectiveness of U.S. deterrent forces may on some critical occasions be tied to the flexibility and diversity of the U.S. nuclear arsenal, and thus to its size. Former National Security Advisor, Brent Scowcroft and Arnold Kanter, rightly emphasized in the past that the burden of proof is on those advocating deep reductions to show that the adaptability of U.S. forces that may be necessary for deterrence, now and in the future, will be retained in the context of deep reductions and other policies that reduce U.S. diversity, flexibility and resilience.<sup>107</sup>

### ***Problem Solved? Substitute Conventional Forces for Nuclear***

Minimum Deterrence proposals typically emphasize that the United States can and should substitute advanced conventional forces for nuclear forces. This, they say, will help enable the United States to reduce its nuclear forces to very low levels without jeopardizing deterrence.

Minimum Deterrence proponents claim that 10-30 percent of the targets in Russia previously assigned to U.S. nuclear weapons, and 30-50 percent of the targets in China, may now be covered by non-nuclear weapons, and the U.S. nuclear requirements for deterrence are therefore correspondingly lower.<sup>108</sup> Such statements, however, even if accurate regarding the targets that may now be threatened by advanced conventional forces, may tell us precious little about how deterrence will function and the requirements for deterrence. It is a non sequitur to presume that because conventional weapons are increasingly lethal they can substitute for nuclear weapons for deterrence purposes. That linkage will depend on how opponents now and in the future perceive such forces, understand the consequences if those forces are employed, and correspondingly calculate their interests. Will opponents be cognizant of technical, military-operational details and, if so, will the fact that U.S. conventional weapons are more lethal than in the past determine their deterrence decision making?

The answer to such questions are not predictable with confidence even when dealing with well-known opponents in the present; answers with regard to more obscure leaderships or future unknown leaderships are even more opaque. On many or some occasions, the technical, military-operational facts regarding the prospective lethality of U.S. conventional weapons may not determine or even influence an opponent's decision making. Opponents in the future may believe, as they have in the past, that U.S. nuclear capabilities uniquely threaten uncontrollable and incalculable consequences.

Again, in making claims about the substitution of conventional forces for nuclear, Minimum Deterrence proponents presume that they can predict reliably how diverse opponents, now and in the future, will perceive and calculate threats and risks, and therefore presume that they can make universal claims about opponent decision making and deterrence. Such claims are not credible—despite the certainty with which they frequently are expressed.<sup>109</sup>

### ***Military-Technical Considerations***

Beyond the uncertainties of opponent perceptions and decision making, there are technical reasons why conventional weapons may not be able to substitute for nuclear weapons for at least some deterrence threat purposes. In 2004, the Defense Science Board (DSB) identified some limitations of advanced conventional payloads potentially pertinent to their role in deterrence.<sup>110</sup> For example, conventional forces are not structured to maintain alert levels equivalent to strategic nuclear forces. In addition, they may:

- lack sufficient lethality to hold some types of targets at risk, including hard and deeply buried targets;
- not function as necessary in the context of limited target information and/or fewer delivery inaccuracies, e.g., in the absence of support from Global Positioning System satellites;
- have uncertain system reliability and survivability in nuclear and electromagnetic pulse (EMP) environments;
- lack the ability to penetrate heavily defended areas with a high probability of success; and,
- lack the delivery system range for many targets deep in an adversary's interior.<sup>111</sup>

These limitations may explain why only a small fraction of STRATCOM's nuclear targets reportedly are vulnerable to conventional weapons.<sup>112</sup> On those occasions when such technical, military-operational considerations are important to the functioning of deterrence, these limitations could reduce the prospects of U.S. conventional forces providing the hoped-for deterrence effect.

The lethality difference separating nuclear and conventional weapons is enormous. Former STRATCOM Commander Admiral Richard Mies, summed this up: "Pound for pound, nuclear weapons were several million times more potent."<sup>113</sup> It reportedly is technically impossible to completely bridge the gap between the destructive potential of conventional and nuclear weapons, or even to reduce the disparity to a factor of 1,000.<sup>114</sup> This limit, if accurate, could be important for deterrence considerations because there are enormous economic and operational challenges associated with increasing by a factor of ten or more the number of weapons needed to hold a susceptible target at risk reliably. For example, in the context of retaliation to even a "small" nuclear attack against the United States, a protracted U.S. conventional air campaign could be impossible. Consequently, conventional U.S. deterrence threats that would depend on such a campaign could rightly be incredible.

Even for targets that can in principle be threatened reliably by conventional weapons, the harder the target, the more difficult it is to hold at risk. This may be significant for deterrence in some situations. For example, the 2005 U.S. National Academy of Sciences report on the *Effects of Nuclear Earth-Penetrator and Other Weapons* noted that, "Potential adversaries worldwide are

using underground facilities to conceal leaders, military and industrial personnel, weapons, equipment, and various other assets....Of the estimated 10,000 HDBTs [hard and deeply buried targets], about 20 percent have a major strategic function..."<sup>115</sup> Since the publication of the National Academy Study, it has been reported that China has 5,000-km of deep underground tunnels.<sup>116</sup>

Nuclear weapons are the only weapons that can threaten facilities deeper than the limited depth that conventional penetrating weapons can reach. During both the Gulf War and NATO's operations in Yugoslavia, the best available U.S. penetrators reportedly were unable to destroy relatively deep underground facilities.<sup>117</sup> In Yugoslavia in 1999, for example, persistent and concerted NATO conventional air strikes failed to destroy a deep tunnel military complex at the Pristina Airport in Kosovo capable of holding numerous aircraft. As a British inspector present at the time reported, "On June 11, hours after NATO halted its bombing and just before the Serb military began withdrawing, 11 Mig-21 fighters emerged from the tunnels and took off for Yugoslavia."<sup>118</sup> It should be noted that until proven wrong, NATO and the Pentagon reportedly believed that these attacks on the underground Mig-21 aircraft had been effective.<sup>119</sup> China's Underground Great Wall could be even more survivable against attack.<sup>120</sup> Russia also reportedly has underground facilities that could be threatened with destruction only by very capable nuclear weapons.<sup>121</sup> As a 2009 study by the Center of Strategic and Budgetary Assessments concluded, nuclear weapons are the only weapons that can, "with a high degree of reliability," threaten mobile targets, fixed missile silos, and hard and deeply buried targets.<sup>122</sup>

Whether such consideration will determine the difference between future deterrence success or failure cannot be predicted with confidence. However, that there is a risk of deterrence failure in the absence of such capabilities should not be doubted.

In addition, reports by both the Congressional Commission on Electromagnetic Pulse and the DSB in 2011 looked at the issue of the effectiveness of conventional weapons in the context of EMP and concluded they were either "inadequate" or their capability was "at best unknown."<sup>123</sup> Apparently no programs are underway to fix this potential deterrence problem for the conventional forces.<sup>124</sup> If U.S. advanced conventional weapons are vulnerable to EMP attack, their potential for deterrence in important plausible contingencies could be compromised.

Finally, because of the great lethality of nuclear weapons, they require only moderate delivery accuracy to hold at risk many hard targets. This may not be true for conventional weapons, which could require either precision or near-precision accuracy (depending on target hardness), and/or very large numbers of weapons (depending upon target size). Such accuracy could be a problem because a main guidance mode for these weapons, including cruise missiles and guided glide bombs, reportedly is the satellite constellation of the Global Positioning System, which apparently could be lost in a nuclear conflict and even denied by a sophisticated adversary with non-nuclear means.<sup>125</sup> Alternative guidance modes could be costly and may not be developed in the current budget environment.

Of course, deploying large numbers of advanced conventional forces may not be practicable. Indeed, if U.S. defense budget austerity continues, it is not clear that the United States will seriously pursue advanced conventional strategic forces—much less take the additional steps that may be important if they ever are to be a credible replacement, even in a limited way, for nuclear weapons for deterrence purposes. For example, even the very reasonable option of a

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small program of intercontinental-range conventional ballistic missiles reportedly favored by some in the Obama administration is not now funded.<sup>126</sup>

It may well be the case that advanced U.S. conventional forces can threaten some of the targets previously assigned to nuclear weapons and it certainly is sensible to pursue such capabilities as a means of advancing the flexibility and diversity of U.S. deterrence forces.<sup>127</sup> They may very well provide a useful complement to U.S. capabilities for deterrence and the assurance of allies, as may theater ballistic missile defenses. But there is no basis for the confident generalization that these systems can substitute reliably for U.S. nuclear forces for deterrence purposes, now or in the future. Opponent decision making in the future simply is too opaque for such fine-grained prediction. And, on those future occasions when such technical, military-operational considerations are pertinent to the functioning of deterrence, there appear to be some significant technical-operational limitations to the potential for substitution for this purpose.

As noted above, historical evidence suggests that nuclear weapons have in the past provided the unique deterrence advantage of making the consequences of attacking the United States and allies appear incalculable and uncontrollable for the aggressor. This effect appears to have been important, even essential, to deterrence on occasion in the past. This does not “prove” that this effect will be essential for deterrence in the future, but proponents of Minimum Deterrence have not offered any reason to believe that it will not be so, and there is little or no evidence to suggest that conventional forces can provide this same deterrence advantage reliably and serve as a reliable substitute. Again, the burden of proof is on those Minimum Deterrence proponents who make significant claims about the future that are inconsistent with evidence and past experience.

## **Summary**

Several conclusions should be drawn from this comparison of confident Minimum Deterrence claims about the functioning of deterrence against available evidence. First, Minimum Deterrence makes promises about deterrence working at very low nuclear force levels, now and in the future. Yet, historical evidence demonstrates conclusively that such promises cannot be taken seriously. Deterrence is not so predictable and there are substantial political-psychological and technical, military-operational reasons for doubting them. Similarly, it is not possible to predict if conventional forces can substitute with comparable deterrent effect.

Second, and correspondingly, the requirements for deterrence working are highly dependent on the opponent and context of any given contingency. In some cases it appears that nuclear threats can contribute uniquely to deterrence because they can make the consequences of aggression appear uncontrollable and incalculable to a would-be aggressor. We are unlikely to know in advance when this deterring effect will make the difference between war and peace, but it appears to have done so on occasion in the past.

Third, in the contemporary dynamic and uncertain security environment, prediction of opponent decision making is particularly challenging because of the diversity of decision makers and contexts. In this environment, the flexibility, diversity, resilience and adaptability of U.S. forces and planning may contribute critically to deterrence by providing a spectrum of U.S. threats to deter a broad range of opponents and threats. The value of this diversity may be enormous in

an era when a single deterrence failure could be catastrophic—even if non-nuclear weapons alone are involved.

In contrast to Minimum Deterrence proposals to lock in further “legally-binding” deep force reductions and narrow nuclear threat options, U.S. forces with greater flexibility and resilience may provide the adaptability necessary to deter in a dynamic, uncertain security environment. There may be prudent options for future negotiations and reductions. But, recognition of the linkage between the prospects for effective deterrence and the U.S. arsenal’s flexibility and diversity suggests that U.S. arms control policy should become less of a mechanistic quest for ever-lower numbers and tighter restrictions, and focus more on retaining the flexibility, diversity and resilience of U.S. forces and planning that may be critical for deterrence in a dynamic and uncertain era.

Finally, Minimum Deterrence proponents frequently recommend U.S. deterrence threats to opponents’ civilian targets as the basis for deterrence. This approach to deterrence is compatible with very low U.S. force numbers, but it has serious legal, moral and credibility problems—which is why it has been rejected consistently by Democratic and Republican administrations for decades.

When the Minimum Deterrence narrative was first elaborated early in the Cold War, there was little historical evidence and less understanding of human cognition with which to examine its main propositions and promises about deterrence. Proponents claimed then, as now, that they know that deterrence will work predictably at very low force levels. These claims were (and remain) essentially universal, unbounded by opponent or context. However, decades of pertinent historical and cognitive evidence now is available to test such Minimum Deterrence claims; they do not fare well upon examination.

*“Nuclear ambitions in the US and Russia over the last 20 years have evolved in opposite directions. Reducing the role of nuclear weapons in US security strategy is a US objective, while Russia is pursuing new concepts and capabilities for expanding the role of nuclear weapons in its security strategy.”<sup>128</sup>*

*National Intelligence Council*

**2. Russia and China are not U.S. adversaries; U.S. nuclear deterrence and force-sizing considerations no longer need to take threats from these countries into immediate account.**

Minimum Deterrence proposals almost always argue that in the post-Cold War period neither Russia nor China constitutes a threat to the United States. The *Global Zero* report, for example, states that, “Russia and China are not enemies of the United States,” “regarding Russia and China, large-scale conflict with the United States is implausible,” and, “The risk of nuclear confrontation between the United States and either Russia or China belongs to the past, not the future....”<sup>129</sup> The *Global Zero* report includes the assertion that the United States can dramatically cut nuclear forces because “several hundred experts” surveyed by the Council of Foreign Relations do not believe that Russia threatens the United States.<sup>130</sup>

This claimed absence of a serious security threat from Russia or China, now or in the future, is a basis for the Minimum Deterrence recommendations for large and possibly unilateral cuts in U.S. nuclear forces: if there is no need for nuclear deterrence in relations with Russia or China, we need not fear the consequences for deterrence of deep nuclear force cuts.<sup>131</sup> For example, “reducing [U.S.] force levels in the manner described above [500 warheads, and reductions to a nuclear dyad] would provide the United States with the opportunity to lead by example, while not significantly sacrificing national security.”<sup>132</sup>

This Minimum Deterrence proposition that Russia and China do not constitute a threat to the U.S. can be tested against available evidence. There is inherent uncertainty in any prediction about the character of future threats, particularly those that could arise over the next two or three decades, which is the relevant time frame regarding nuclear force planning and acquisition. However, the potential for threats from Russia and China may be examined via a review of Russian and Chinese statements and actions regarding their aspirations that conflict with U.S. and allied interests, the nature of their respective nuclear force modernization programs, and the types of military exercises they stage. These can provide evidence of intentions that could spark crises, and Moscow’s and Beijing’s perceptions of the United States as a potential enemy. In particular, it is possible to identify the modernization of Russian and Chinese nuclear systems intended for intercontinental threat or strike.

The asserted absence of a threat from Russia can be tested by reviewing Russian leadership statements, Russian nuclear modernization programs, exercises and doctrinal literature, including the new (2010) military doctrine, which discusses external threats. There is extensive Russian public literature, much of it by civilian officials and military leaders, which discusses their strategic goals, nuclear doctrine, threat perceptions, and their nuclear programs, including both delivery systems and nuclear warhead development.<sup>133</sup>

With regard to China, testing this Minimum Deterrence proposition is more difficult because the Chinese are far more secretive with regard to the specifics of their military programs than is Russia.<sup>134</sup> In addition, there are considerable propaganda aspects of Chinese nuclear doctrine that have to be considered.<sup>135</sup> According to the Pentagon's report on Chinese military power, "From Beijing's perspective, strategic ambiguity—including strategic denial and deception—is a mechanism to influence the policies of foreign governments and the opinions of the general public and elites in other countries."<sup>136</sup> Nevertheless, the main thrust of Chinese objectives and programs can be examined based on open sources and therefore claims that there is no plausible Chinese threat pertinent to nuclear deterrence can be tested.

### **Stubborn Facts**

Both Russia and China express hostility toward the United States, regard the United States as their primary adversary, and appear to plan their military forces, including their nuclear forces, against the United States and allies. Correspondingly, both Russia and China are dramatically increasing their defense spending, including for nuclear forces, which they certainly see as of great continuing salience in their relations with the United States.<sup>137</sup> Making this point is not to repeat a Cold War perspective; it is to acknowledge contemporary reality.

### ***Russia***

With the demise of the Soviet Union, Russia officially adopted the position that its military forces were directed against no state. In practice, however, this was never true. According to Konstantin Kosachev, Chairman of State Duma International Affairs Committee, "Russian military strategists proceed from the premise that the chief (and maybe the only) threat to the country, as in Soviet times, is posed by a possible US nuclear strike," which dominates the Russian attitude toward nuclear weapons.<sup>138</sup> The 2010 version of Russian military doctrine stated, "[one of the] main external military dangers [is] the desire to endow the force potential of the North Atlantic Treaty Organization (NATO) with global functions carried out in violation of the norms of international law and to move the military infrastructure of NATO member countries closer to the borders of the Russian Federation, including by expanding the bloc."<sup>139</sup> U.S. missile defense was also high on the list.

Russia has become increasingly anti-democratic and hostile to the United States.<sup>140</sup> The "Putin Doctrine" apparently focuses on Russian recovery of geostrategic assets lost since the Cold War, and incorporates increasing authoritarianism, expressed hostility towards the United States, and nuclear force modernization.<sup>141</sup> Alexei Kudrin, Russian finance minister until September 2011, has noted: "Xenophobia is widespread" in Russia; the Kremlin encourages nationalism; it is militarizing the country; it voices "anti-Western rhetoric"; and, "a sizeable number of Russians... see neighboring countries as part of our zone of influence."<sup>142</sup> This latter view does not bode well for some U.S. allies. U.S.-Russian relations appear to have plummeted to levels not seen since the Brezhnev era; well-respected Russian journalists openly describe the extreme hostility of Russia's political leadership toward the United States, and its expectations of conflict with the United States and allies.<sup>143</sup> Russian nuclear weapons policy appears to derive from such beliefs.

### ***Divergent Nuclear Ambitions***

Russia reserves the right to use nuclear weapons in conventional war.<sup>144</sup> Both Russia's year 2000 and 2010 nuclear doctrines involve a nuclear strategy in which the first use of nuclear weapons is characterized as "de-escalation" of the conflict.<sup>145</sup> As summed up by the National Intelligence Council, "Nuclear ambitions in the US and Russia over the last 20 years have evolved in opposite directions. *Reducing the role of nuclear weapons in US security strategy is a US objective, while Russia is pursuing new concepts and capabilities for expanding the role of nuclear weapons in its security strategy.*"<sup>146</sup> (Emphasis added.) In 2011, according to then-senior White House official Gary Samore, Russia probably maintained ten times as many tactical nuclear weapons as the U.S.—thousands versus hundreds.<sup>147</sup>

As noted Russian journalist Alexander Golts has observed, Russia "has tried to leverage its huge nuclear arsenal that it inherited from the Soviet Union into a source of greater influence in international affairs."<sup>148</sup> According to then-Russian Chief of the General Staff General Nikolai Makarov, "The strategic nuclear forces for us are a sacred issue."<sup>149</sup> Russian officials appear to believe that nuclear war talk enhances Russia's power. In 2008, according to then-Chief of the General Staff General Yuriy Baluyevskiy, "all our partners must realize that for the protection of Russia and its allies, if necessary, the Armed Forces will be used, including preventively and with the use of nuclear weapons."<sup>150</sup> In November 2011, General Makarov said, "In some conditions I do not rule out that local and regional armed conflicts may grow in a large-scale war, particularly with the use of nuclear weapons."<sup>151</sup>

Senior Russian officials routinely make nuclear threats, including direct targeting threats and threats of preemptive nuclear attack against U.S. allies. For example, in 2007, Russian Gen. Nikolay Solovtsov, then commander of Russian Strategic Missile Troops, said "I do not rule out that our political and military administration may target some of our intercontinental ballistic missiles at ... Poland and the Czech Republic."<sup>152</sup>

Russia routinely exercises its nuclear forces against NATO and the U.S.<sup>153</sup> Russia first announced the simulated first use of nuclear weapons in the Zapad 1999 European regional war exercise and similar exercises have been routinely conducted since that time.<sup>154</sup> A 2008 report by the U.S. Department of Energy and the U.S. Department of Defense noted Russia "has re-incorporated theater nuclear options into its military planning."<sup>155</sup> Russia also conducts large strategic force exercises.<sup>156</sup> Indeed, in late October 2012, the Kremlin announced "strategic nuclear forces' exercises" in which President Putin "oversaw test launches of strategic and cruise missiles which reached set targets at various military testing grounds."<sup>157</sup> Moreover, Russia routinely flies nuclear capable bombers into the air defense identification zones of the U.S., NATO nations, and Japan.<sup>158</sup> In 2009, then-commander of the Strategic Missile Forces Lt.-Gen. Andrey Shvaychenko outlined Russian nuclear targeting: "In peacetime, they [strategic nuclear missiles] are intended to ensure deterrence of large-scale non-nuclear or nuclear aggression against Russia and its allies. In a conventional war, they ensure that the opponent is forced to cease hostilities, on advantageous conditions for Russia, by means of single or multiple preventive strikes against the aggressors' most important facilities. In a nuclear war, they ensure the destruction of facilities of the opponent's military and economic potential by means of an initial massive nuclear missile strike and subsequent multiple and single nuclear missile strikes."<sup>159</sup>



Russia's effort to modernize virtually its entire missile force by 2020 is likely aimed at the United States. In February 2012, Vladimir Putin announced that Russia would procure more than 400 new intercontinental ballistic missiles (ICBMs) by 2020.<sup>160</sup> The Obama administration has said Russia will deploy "several substantially MIRVed new strategic missiles [missiles with multiple independently targetable reentry vehicles], including the MIRVed Yars ICBM, new Borey-class missile submarines carrying 16 MIRVed Bulava SLBMs, and, in the event it is deployed during the life of the [New START] Treaty, a planned new 'heavy' ICBM to replace the SS-18 that will almost certainly carry several MIRVs."<sup>161</sup> Reportedly the heavy ICBM will carry 10-15 warheads.<sup>162</sup> In January 2013, Russia announced that it would lay down the fifth and sixth Borey ballistic missile submarines in 2013.<sup>163</sup> Two new SSBNs in one year is a first since the end of the Cold War. A new Russian strategic bomber reportedly will first fly in 2017.<sup>164</sup> According to ITAR-TASS, Russia probably has "in the range of 15,000 to 17,000 total [nuclear] warheads."<sup>165</sup> It continues to develop new nuclear weapons, including strategic and tactical nuclear weapons and low-collateral-damage designs, reportedly with the aid of continued hydronuclear testing.<sup>166</sup> In 2006, then-Defense Minister Sergei Ivanov declared that Russia would soon have "unique" nuclear weapons that would "allow us to guarantee our security and sovereignty against any threat, absolutely any threat that exists...or could arise in the future."<sup>167</sup>

It is not an overstatement to observe that Russia's nuclear modernization programs reflect a view of nuclear weapons that is completely contrary to U.S. efforts to reduce U.S. reliance on and the salience of nuclear weapons. Similarly, Russian views of the United States are contrary to Minimum Deterrence assertions that nuclear deterrence is not now and will not again be pertinent in U.S.-Russian relations.

### **China**

China remains an authoritarian communist state, and for two decades has been increasing its military budget by more than ten percent per year. According to the Pentagon's report on China's military power, China's armed forces are designed to "fight and win 'local wars under conditions of informatization,' or high-intensity, information-centric regional military operations of short duration,"<sup>168</sup> i.e., against the United States. Called "active defense," Chinese strategy is widely characterized as an "anti-access" strategy in the West, and China is spending large sums to obtain capabilities to prevent U.S. assistance to Taiwan.<sup>169</sup> Nuclear weapons play a key role in China's military strategy of "active defense."<sup>170</sup>

Chinese nuclear doctrine is hidden by political propaganda, most notably a pledge of "no first use" of nuclear weapons. A careful look at the Chinese wording of its "no first use" policy reveals that it commits China to nothing.<sup>171</sup> The Pentagon report on the Chinese military appears to understate when it says, "there is some ambiguity" concerning China's first use policy, including attacks on Taiwan and nuclear EMP attacks.<sup>172</sup> The Kyodo News Agency reported that it obtained classified Chinese documents which state that China "will adjust [its] nuclear threat policy if a nuclear missile-possessing country carries out a series of air strikes against key strategic targets in our country with absolutely superior conventional weapons..."<sup>173</sup> (i.e., against the United States). Chinese generals openly threaten nuclear first use against the United States if it comes to the aid of Taiwan.<sup>174</sup>

According to the Pentagon, China is deploying two new ICBMs, the DF-31 and DF-31A; developing a new submarine-launched ballistic missile (SLBM), the JL-2; and building a new

type of ballistic missile submarine, at least six of which reportedly will be deployed.<sup>175</sup> Taiwan confirmed the reported successful launch of JL-2 SLBMs in December 2011; this development will probably result in the relatively early deployment of these missiles.<sup>176</sup> In 2012, China reportedly tested the DF-41, a large heavily MIRVed ICBM (10 warheads).<sup>177</sup> China is reportedly developing a rail-mobile ICBM.<sup>178</sup> There are reports in the Asian press that China plans to deploy 576 MIRV warheads on six submarines.<sup>179</sup>

China has continued to develop and deploy new nuclear weapons since the end of the Cold War. It conducted large nuclear tests until 1996 and may have conducted covert nuclear tests since its declared testing moratorium in 1996.<sup>180</sup> Xue Bencheng, an important Chinese nuclear weapons scientist, characterized the July 1996 Chinese nuclear test as “a great spanning leap” which solved the problem of nuclear weapons miniaturization.<sup>181</sup> This test apparently set the stage for the nuclear modernization programs now underway.

The U.S. government estimates that China’s nuclear arsenal is a few hundred weapons.<sup>182</sup> In 2011, Taiwan’s defense ministry estimated that China’s Second Artillery had between 450 and 500 nuclear weapons.<sup>183</sup> The total number of nuclear weapons would, of course, be higher because the Second Artillery does not control the nuclear weapons of the naval or the air forces. Some Russian experts believe China now has one thousand to several thousand nuclear weapons.<sup>184</sup> Col-Gen. (ret.) Viktor Yesin, former commander of the Strategic Missile Troops, states, “My estimate of China’s nuclear arsenal today is 1,600 to 1,800 warheads.”<sup>185</sup> Irrespective of what the current number is, there is no doubt it will increase.

## **Summary**

The Minimum Deterrence claim that Russia and China do not constitute plausible threats pertinent to nuclear deterrence and will not do so in the future reflects a hope, but considerable available evidence suggests otherwise. At a time when the United States is dramatically reducing both defense expenditures and nuclear weapons, Russia and China are doing the opposite. At a time when Minimum Deterrence proposals assert that hostilities between the United States and Russia or China are implausible, both countries are talking and acting on the opposite premise. Hoping that benign relations will prevail for now and the future is reasonable; ignoring or discounting opponents’ expressions of hostility, and instead basing U.S. calculations of deterrence requirements on hope, is not reasonable.



*“All generalities are false, including this one.”*

*MG Fox Conner, USA*

*(Mentor to Generals Dwight D. Eisenhower and George C. Marshall)*

### **3. Nuclear weapons are irrelevant to today’s most pressing security threat—WMD terrorism—therefore, few nuclear weapons are needed.**

Minimum Deterrence proposals often repeat statements from the George W. Bush administration and the Obama administration that nuclear terrorism now poses the greatest threat to the United States and its allies. They typically cite this point as an initial proposition from which to argue that nuclear weapons are of little value in deterring terrorist leaders, and thus relatively unimportant to U.S. security. This conclusion follows from the widely held view that terrorists cannot be deterred, either because they have “no return address” or because they are irrational fanatics—or both.

Thus the *Global Zero* report claims: “9-11 exposed the lack of efficacy—indeed, the irrelevance—of nuclear forces in dealing with 21st century threats.”<sup>186</sup> Similarly, the 2009 International Commission on Non-proliferation and Disarmament argued, “Whether or not terrorism can be deterred, or only prevented and defeated, and whether or not terrorist actors are themselves threatening or using nuclear weapons or explosive devices, nuclear weapons are manifestly neither strategically, tactically nor politically necessary or useful for this purpose.”<sup>187</sup>

Using this same line of reasoning, a Federation of American Scientists proposal for Minimum Deterrence states that, “The missions assigned to nuclear weapons during the Cold War might or might not have made sense during the Cold War but there is no reason to think they would have any relevance at all to the radically different conditions of today.”<sup>188</sup> Minimum Deterrence proposals then typically conclude that few U.S. nuclear weapons are needed now and in the future.<sup>189</sup>

To test this element of the Minimum Deterrence narrative, two propositions need to be examined: 1) U.S. nuclear weapons have no contemporary or future role in deterring nuclear or other WMD terrorism, which is the current threat of concern; and, 2) there are no other contemporary or plausible future priority threats that would necessitate larger force requirements than those favored by Minimum Deterrence. These two assertions, if true, facilitate the conclusion that the U.S. can reduce its nuclear forces to very low numbers.

To test the first proposition that U.S. nuclear weapons are irrelevant to terrorist threats, it is possible to examine case studies of conflicts between states and terrorist organizations. The goal of this examination is to use available history and other empirical evidence to determine:

- 1) the degree to which terrorist organizations behave rationally with regard to their goals (connect ends with means), and thus, in principle, are susceptible to U.S. deterrence strategies;

- 2) the degree to which severe threats have served a useful role in influencing the decisions of terrorist organizations and their supporters and patrons; and,
- 3) the possible link between U.S. nuclear capabilities and the deterrence of terrorist organizations via their state sponsors (“indirect deterrence”). Evidence of critical partnerships between terrorist organizations and WMD-armed states that may be susceptible to U.S. nuclear deterrence strategies will be relevant to a determination concerning the role (or lack thereof) for nuclear weapons in deterring WMD terrorism.

To test the second proposition that there are no threats beyond WMD terrorism that are pertinent to U.S. nuclear capabilities, it is possible to examine contemporary threat developments beyond those involving terrorist organizations. Section Two provided an overview of pertinent findings regarding Russia and China which demonstrated that this proposition is contrary to much available evidence.

### **Stubborn Facts**

The common assertion that nuclear terrorism is the priority threat facing the United States may or may not be true. Rarely, if ever, is the claim supported with corresponding evidence to demonstrate why this threat should be deemed the most grave. If true, that priority could shift rapidly and dramatically to state-based WMD threats against which nuclear deterrence may be uniquely effective. However, even if nuclear terrorism is and remains the priority threat, state-based WMD threats remain, as does the corresponding value of U.S. nuclear capabilities for the deterrence of those threats and the assurance of allies.

Perhaps more importantly for this discussion, the claim that U.S. nuclear deterrence is irrelevant to countering the threat of nuclear terrorism almost certainly is mistaken. Studies of conflicts between states and non-state actors (NSAs)—including terrorist groups—provide ample evidence of NSAs rationally connecting ends with means, which is a necessary condition for an opponent to be susceptible to deterrence. One recent report analyzed ten case studies of conflicts between states and NSAs spanning two centuries and revealed unequivocal evidence of links between ends and means in NSA planning.<sup>190</sup> Examples include:

- The Irish Republican Army (IRA) used urban attacks (1919-1921) on British establishments as one method to provoke disproportionate responses from British authorities and, thereby, help to unite the Irish populace against British rule. The end goal sought by IRA leader Michael Collins was self-rule for Ireland.
- During the 1970s and 1980s, several European states contended with deadly urban terrorist groups within their own borders. Germany was terrorized by the Red Army Faction, Italy by the Red Brigades, Spain by Basque separatists, and France by a group which called itself *Action Directe*. These groups kidnapped government officials or business leaders and conducted terrorist attacks against government centers. The Basque separatist organization, *Euskadi Ta Askatasuna* (ETA), sought semi-autonomous rule over the traditional Basque territory in Spain while others, such as the Red Army Faction and Red Brigades, sought to overthrow governments which the NSA leaders viewed as corrupt.

- During the period 1985 to 2000, the Israeli Army occupied southern Lebanon to provide a security buffer for Israel. Hezbollah, an Iranian-backed NSA that operated from southern Lebanon, attacked Israeli civilians within and external to Israel and kidnapped Israeli military personnel. Hezbollah's supreme leader, Hasan Nasrallah, sought to establish Hezbollah as a political force within Lebanon while pressuring Israeli officials to cease hostile incursions against Hezbollah.

Numerous other examples from case studies of terrorist groups and other NSAs provide evidence that many, indeed most, undertake actions which are linked to specific objectives: NSAs connect means (including terrorist attacks) with objectives. The thought processes of NSA leaders may appear unfamiliar, eccentric, brutal, even irrational, to some western observers, but they are often coherent and logical when viewed from the perspective of the NSA's background, organizational structure, culture and religion.

Case studies also provide evidence that states have used severe threats effectively to deter and coerce NSAs and their key allies. Examples of threats by states against NSAs include:

- The Soviet Union is reported to have threatened to punish harshly those Hezbollah members involved in the 1985 kidnapping of its diplomats and intelligence officers in Beirut. Offensive threats were communicated through a demonstrated willingness by the Soviets to capture and murder family members of those involved as well as suggesting a possible missile attack against Hezbollah's patron, Iran. A Soviet official reported that he used a meeting with an Iranian official to suggest that an "accidental" launch of a missile might land in Qom. The timing of the release of the captured Soviet hostages indicates that these threats may have been an effective lever in influencing the decisions of Hezbollah leaders (and their Iranian sponsors).<sup>191</sup>
- During the 1990s, Israel often conducted military operations into Palestinian territory in response to terrorist attacks conducted by Hamas and others. These incursions disrupted the planning and preparations of Palestinian militants and put pressure on Palestinian leaders to not provoke further incursions.<sup>192</sup>
- As discussed earlier, in the 1990s Israel demonstrated its willingness to conduct disruptive military operations against Hezbollah in southern Lebanon. After Israel's withdrawal from the southern Lebanon "security zone" in 2000, the prospect of the reapplication of this type of tactic against Hezbollah motivated its leader, Hassan Nasrallah, to restrict Hezbollah's actions and comply with a number of de facto "redlines" established over time by Israeli-Hezbollah skirmishes.<sup>193</sup>
- European states used targeted killings and decapitation of NSA organizations effectively to disrupt planning and over time demoralize members of organizations such as the Red Army Faction and Red Brigades. Memoirs written by former members provide first-hand accounts of the demoralizing consequences of the loss of senior leaders and the eventual realization that the hoped-for goals were unattainable. In one case study, the demoralization led to the collapse of the Red Army Faction.<sup>194</sup>

In short, abundant evidence exists that many NSAs establish a logical connection between ends (desired objectives) and means (terrorist or other types of attack). The evidence also shows

that severe threats can be effective in deterring or coercing NSAs when enabling conditions are present.

The next issue to be considered is whether or not U.S. nuclear weapons could be of value in deterring nuclear, biological or other WMD terrorism. A staple of the Minimum Deterrence narrative is to deny any such possibility.

When the threat of WMD-related terrorism is raised, the oft-cited perpetrator is core al-Qa'ida or one of its affiliates. For example, President Obama's 2011 *National Strategy for Counterterrorism* states that despite recent U.S. successes against al-Qa'ida, including the death of Osama bin Laden, "The preeminent security threat to the United States continues to be from al-Qa'ida and its affiliates...."<sup>195</sup> And, "The danger of nuclear terrorism is the greatest threat to global security."<sup>196</sup> In December 2011, then-Secretary of State Hillary Clinton underscored al-Qa'ida's efforts to develop various types of weapons of mass destruction, including biological weapons.<sup>197</sup>

However, concern over WMD terrorism extends beyond al-Qa'ida. Several NSAs that have perpetrated brutal terrorist attacks on civilians are affiliated with states that currently possess or may possess WMD. For example, Hezbollah, based primarily in southern Lebanon, is financed by and affiliated with Iran. Hezbollah also cooperates closely with Syria, which has large stocks of chemical weapons. Another terrorist organization, Hamas, also has had close ties with Syria.

Iran, the foremost state sponsor of terrorism, is a particular concern. Iran provides material support to terrorist and militant groups such as Hamas, Lebanese Hezbollah, the Palestinian Islamic Jihad, the Taliban, and Iraqi Shi'a groups. According to the Director of the National Counterterrorism Center, "Iran's Islamic Revolutionary Guard Corps-Qods Force and Ministry of Intelligence and Security have been involved in the planning and execution of terrorist acts and the provision of lethal aid—such as weapons, money and training."<sup>198</sup> The Defense Intelligence Agency reported that Iran maintains dual-use facilities intended to produce chemical warfare agents in times of need and Iran's biological warfare efforts have evolved beyond the R&D stage.<sup>199</sup> Available evidence indicates that Iran is also developing a nuclear weapon capability.

Al-Qa'ida, Hamas, Hezbollah and other terrorist groups are unlikely to be able to acquire or develop and employ WMD attacks on the West without significant resources and cooperation by state sponsors and/or key organizations within states. Consequently, for cases involving multiple parties working in concert, including state sponsors, the concept of "indirect deterrence" may be an appropriate strategy. Indirect deterrence seeks to deter one or more members of an alliance (i.e., state sponsors or supporters/suppliers) from providing important assistance to another member—in this case, a terrorist group.

While terrorist leaders might not be deterred easily, influential leaders within states that support terrorist groups may be unwilling to be responsible or to pay a high price for mass-casualty attacks perpetrated by the NSAs they support. Historical evidence suggests this point as stated by analysts Matthew Kroenig and Barry Pavel, "... retaliatory threats might be ... effective against those actors in a terrorist network who value their lives and property, such as leaders, financiers, and clerics ...."<sup>200</sup>

Furthermore, Brad Roberts, in his report on deterrence and WMD terrorism, concludes: “deterrence is not irrelevant to the effort to combat terrorism and to reduce the risks of WMD terrorism.” According to Roberts, “deterrence may succeed in lowering the lethality of individual attacks with WMD, by inhibiting the cooperation of those most capable of developing and employing WMD.” The potential to deter very high consequence attacks by influencing the participation of state sponsors and other enablers would be an important objective even if lower consequence attacks were not prevented.<sup>201</sup>

Indirect deterrence has been used to good effect in the past. States in conflict with NSAs have sometimes threatened the state sponsors of NSAs in attempts to change the behavior of NSAs. As mentioned earlier, in 1985 the Soviet Union reportedly threatened an “accidental” missile strike against Iran as part of its strategy to pressure Hezbollah to release its Soviet hostages. Similarly, Israel has periodically threatened Syria as one element of its attempts to deter attacks from Hezbollah and Hamas.

In a recent example of indirect deterrence, in January 2013 Israel conducted an airstrike against a military target inside Syria, near the border with Lebanon. According to press reports, the strike was a warning to Syrian leaders to keep Russian-made anti-aircraft missiles out of the hands of Hezbollah.<sup>202</sup> Giora Eiland, the former head of Israel’s national security council, stated that the strike should be construed as a “red line” to Syria, warning against transfers of advanced military technology to Hezbollah (i.e., to deter). In an interview he said that any transfer to Hezbollah of weapons, such as Russian anti-aircraft missiles or long-range Scud missiles, would be considered to be game-changers and would be viewed as gravely as a chemical threat.<sup>203</sup> Thus, Israel employed indirect deterrence against Syria to try to deter the transfer of advanced military technology to Israel’s adversary, Hezbollah.

Another example illustrates an application of indirect deterrence by the United States, albeit with apparent mixed results. The United States Government communicated a threat to a state—North Korea—which possesses WMD, including nuclear weapons and radiological materials. North Korea has been reported to transfer nuclear technology to Pakistan and Iran. This technology and material could, by accident or design, find its way to terrorist groups in either country. To help deter any such transfers, in November 2006, President George W. Bush issued a stern warning to the leaders in North Korea. In a speech at the National University of Singapore, Bush warned, “The transfer of nuclear weapons or material by North Korea to states or non-state entities would be considered a grave threat to the United States and we would hold North Korea fully accountable for the consequences of such an action.”<sup>204</sup>

In February 2008, then-National Security Advisor Stephen Hadley delivered a speech in which he elaborated further on the U.S. policy for dealing with state-enabled WMD terrorism. He said, “the United States has made clear for many years that it reserves the right to respond with overwhelming force to the use of weapons of mass destruction against the United States, our people, our forces and our friends and allies. Additionally, the United States will hold any state, terrorist group, or other non-state actor fully accountable for supporting or enabling to obtain or use weapons of mass destruction ...”<sup>205</sup> This policy of holding states accountable for WMD terrorism was also reaffirmed by President Obama’s first Secretary of Defense, Robert Gates. On May 30, 2009, referring specifically to the threat posed by North Korea, Gates said, “The transfer of nuclear weapons or materials to states or non-state entities would be considered a



grave threat to the United States and its allies. ... And we would hold North Korea fully accountable for the consequences of such action.”<sup>206</sup>

In a similar fashion, severe threats, including nuclear, may be needed to communicate to state sponsors of terrorism the high stakes involved if they facilitate in any way nuclear capabilities or employment options for NSAs. A punitive deterrent strategy including the implicit or explicit threat of U.S. nuclear use would seek to make clear that a U.S. response to a mass-casualty WMD attack would change the nature of the conflict with a terrorist group in ways intended to deter its leaders, its operatives, and its supporters—especially state sponsors. This could involve nuclear deterrence. The challenge for deterrence is to exploit the characteristics and sensitivities of each state sponsor/supporter to help those parties reach the decision that facilitating any mass-casualty attack with WMD on the United States and its allies would be too risky because it would invite a devastating response. Whether or not the United States actually would choose to employ nuclear weapons for this purpose is separate from this question of nuclear deterrence. The question is whether state sponsors take punitive threats into account in their calculations of whether or not to assist NSAs. As discussed above, Soviet and Israeli threats to Iran and Syria, respectively, demonstrate that there is evidence to suggest that they will do so, at least on occasion.

## **Summary**

To summarize the outcomes of the three tests discussed above:

- 1) Terrorist leaders often plan analytically and connect ends and means in a logical manner. Numerous case studies provide empirical evidence of such planning.
- 2) In addition, case studies of conflicts between states and NSAs demonstrate that offensive threats have produced positive results in changing the calculus of terrorist organizations and their sponsors.
- 3) Regarding the potential relevance of U.S. nuclear deterrence, severe threats against state sponsors and supporters of terrorist organizations, such as Hezbollah, Hamas and core al-Qa'ida, should not be discarded. The potential of severe threats to hold states accountable for enabling NSA attacks with WMD has been recent U.S. policy. In these cases, “indirect deterrence” may be key and U.S. nuclear capabilities may contribute.

Minimum Deterrence proponents are mistaken when they assert the general proposition that U.S. nuclear weapons are irrelevant to what they view as today's most pressing security threats—WMD terrorism. Ample empirical evidence suggests otherwise. As in other areas of conflict, nuclear weapons may not be relevant to deterring all types of actions; however, they may play an important role in constraining state supporters of terrorism from enabling mass-casualty attacks with WMD.

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*“The trouble with this world is not that people know too little, but that they know so many things that just ain’t so.”*

*Mark Twain*

#### **4. Deterrence considerations alone can determine the size and composition of the nuclear force.**

Minimum Deterrence proposals base nuclear force-sizing requirements on a relatively small number of weapons deemed to be adequate for deterrence.<sup>207</sup> They propose relatively simplistic calculations for deterrence requirements and no further goals appear to shape the recommended size or character of the U.S. nuclear arsenal. For example, in Minimum Deterrence proposals, the strategic goal of assuring allies may be mentioned, but it typically is not included as a separate driver in the calculation of U.S. requirements.

Yet, assuring allies of their security positions is a long-standing U.S. national goal. For decades, the United States has provided an extended deterrence commitment, including the “nuclear umbrella,” to NATO allies, Japan, South Korea and Australia. The assurance of allies via their confidence in a credible U.S. extended nuclear deterrence commitment was key, in some cases, to those allies seeking membership in NATO and, in some cases, to their continuing commitment to remain non-nuclear. Consequently, an essential element of the contemporary Minimum Deterrence narrative is the assertion that the requirements for assuring U.S. allies can be met with very low numbers of U.S. nuclear weapons—largely because U.S. conventional forces and missile defense can provide comparable or superior assurance effect.<sup>208</sup> This claim is important to the narrative because it removes any unique U.S. nuclear requirements for assurance that might otherwise push U.S. nuclear requirements beyond Minimum Deterrence standards.

It is possible to test this important Minimum Deterrence claim against empirical evidence. There is considerable evidence available in this regard in past and contemporary allied reactions to U.S. nuclear force reductions (and withdrawals), and in allied statements concerning the assurance value they attach to U.S. nuclear forces and the characteristics of U.S. nuclear forces they judge as important for their assurance. It similarly is possible to test the claim that non-nuclear forces can provide comparable assurance effect in allied calculations of the requirements for their assurance. In this case, allied views cannot be incorrect about the requirements for assurance—they are the judges of those requirements and many express their views in this regard. That evidence is available to test this part of the Minimum Deterrence narrative.

#### **Stubborn Facts**

The goal of assuring allies has been an important element of U.S. policy for decades. This goal has also been a pillar of the U.S. nuclear non-proliferation strategy. The United States extended its “nuclear umbrella” to countries such as South Korea, Japan and members of NATO to assure the security of these countries and, in doing so, has helped to constrain nuclear proliferation. A 2007 report by the Department of State’s International Security Advisory Board concluded:

There is clear evidence in diplomatic channels that US assurances to include the nuclear umbrella have been, and continue to be, the single most important reason many allies have foresworn nuclear weapons. This umbrella is too important to sacrifice on the basis of an unproven ideal that nuclear disarmament in the US would lead to a more secure world ... a lessening of the US nuclear umbrella could very well trigger a cascade [of nuclear proliferation] in East Asia and the Middle East.<sup>209</sup>

In 2009, the bipartisan Congressional Commission on the Strategic Posture of the United States issued its final report. Based on testimony from allies on U.S. nuclear capabilities and extended deterrence guarantees, the report concluded that some allies “believe that their needs [for assurance] can only be met with very specific U.S. nuclear capabilities,”<sup>210</sup> and that “the requirement to extend assurance and deterrence to others may well impose on the United States an obligation to retain numbers and types of nuclear weapons that it might not otherwise deem essential for its own defense.”<sup>211</sup> Thus, the bipartisan commission rightly suggested that assurance imposes unique requirements on the U.S. nuclear force.

As noted already, U.S. advanced conventional forces and missile defenses may well be important complements to U.S. capabilities for assurance and deterrence, but available evidence does not suggest they can be regarded as alternatives to U.S. nuclear capabilities. Statements by officials and defense commentators in Japan and NATO-Europe illustrate this finding and are discussed below.

### ***Japan***

For Japanese officials, the security environment of the twenty-first century poses numerous concerns. According to one former Japanese defense official, these concerns include: 1) the political, military and economic emergence of China; 2) North Korean nuclear weapon and missile tests; 3) the manifestation of threats emanating from nuclear, biological and chemical weapons; 4) the posture of nations surrounding Japan toward Japan; and 5) the expectation that these conditions will likely exacerbate further. Japanese worries are compounded by the prevailing view that the influence and might of Japan’s key ally—the United States—is declining.<sup>212</sup> This former official listed several suggested actions for Japan. At the top of the list was a review of the “reliability of the nuclear umbrella and reviewing the Three Nonnuclear Principles [of abjuring manufacture, possession, and introduction of nuclear weapons].”<sup>213</sup>

As the threat to Japan from WMD-armed countries in Asia has increased and U.S. nuclear forces decreased, Japanese officials and commentators have become openly and increasingly specific regarding the U.S. nuclear capabilities that assure them. One report from Japan in 2010 discussed the general capabilities which were perceived to be important for the U.S. nuclear umbrella to be credible:

[The United States] must not only possess and deploy an invulnerable nuclear force, but must also put in place an escalation control capability that will force potential aggressors to take the threat of nuclear retaliation seriously. Such capabilities must be underpinned by a superior damage-limiting capability made possible by a strong counterforce capability against the potential aggressor (the ability to effectively destroy the enemy’s nuclear strike force) ...<sup>214</sup>

Some Japanese officials have been very specific about the desired characteristics of U.S. nuclear forces as particularly beneficial for assurance. These valued characteristics include: a range of nuclear capabilities, flexibility, promptness and precision to support U.S. deterrence threats that are not made incredible by the prospect of excessive collateral damage.<sup>215</sup> Also, overall U.S. “superiority” in nuclear weapons is deemed highly desirable for U.S. extended deterrence responsibilities.

Such allied writings and statements reflect the high assurance value of U.S. nuclear capabilities that typically are ignored by Minimum Deterrence. U.S. capabilities that have been important to the Japanese over the years include nuclear capabilities deployable to the region, prompt response capabilities able to threaten an adversary’s nuclear forces, and discriminate (low-yield, accurate) weapons. Yet, these weapon characteristics are largely ignored in Minimum Deterrence considerations.

### **NATO-Europe**

Over the past several decades, NATO allies have also exhibited strong views on the types of U.S. nuclear weapons, including some weapons deployed to Europe, needed to assure them. During the Cold War, the United States deployed thousands of short- and intermediate-range nuclear weapons to Europe to deter Soviet attack as well as to assure European allies.

Recently, the 28 members of NATO deliberated on the strategic posture and capabilities needed for the alliance. NATO’s May 2012 Deterrence and Defense Posture Review report concluded, “Nuclear weapons are a core component of NATO’s overall capabilities for deterrence and defense *alongside* conventional and missile defense forces. The review has shown that the Alliance’s nuclear force posture in addition to conventional offensive and defensive capabilities, currently meets the criteria for an effective deterrence and defense posture.”<sup>216</sup> The current force posture in Europe includes dual-capable tactical aircraft (DCA) and U.S. nuclear weapons deployed to European military bases.

Minimum Deterrence advocates apparently do not view these capabilities as essential for deterrence—and therefore they do not consider these weapons of value for assurance either. The vast majority of Minimum Deterrence force structures examined exclude these weapons. However, as shown by the recent NATO decision to retain DCA and U.S. nuclear weapons in Europe, some European allies strongly hold a different perspective. The 2008 Schlesinger Task Force on DoD Nuclear Weapons Management commented on the usefulness for assurance of these nuclear weapons deployed to NATO bases in Europe: “DCA fighters and nuclear weapons are visible, capable, recallable, reusable, and flexible and are a military statement of NATO and US political will.”<sup>217</sup>

The Schlesinger task force report had some particularly harsh words for those who assert that there was little or no value in continuing to deploy these capabilities to Europe:

This attitude fails to comprehend—and therefore undermines—the political value our friends and allies place on these weapons, the political costs of withdrawal, and the psychological impact of their visible presence as well as the security linkages they provide.<sup>218</sup>

Assurance of allies continues to be an important national goal. The 2010 Nuclear Posture Review lists “strengthening regional deterrence and reassuring U.S. allies and partners” among the key objectives for U.S. nuclear weapons policies and forces.<sup>219</sup>

Each ally is the judge of whether or not it is assured by U.S. commitments and capabilities. And, assurance needs are not static. Changes in context, such as an easing or worsening of the security environment, can result in changes in what allies seek for assurance. This fact again points to the importance of flexibility and resilience in the U.S. nuclear force.

This discussion demonstrates that allies place value on certain U.S. nuclear weapon capabilities not typically included in the Minimum Deterrence calculations of adequacy.<sup>220</sup> This is a critical point because considerable open evidence indicates that some key allies are becoming increasingly concerned about the credibility of U.S. assurances given the direction of U.S. nuclear forces, and as a result, are rethinking their past commitments to remain non-nuclear. In short, Minimum Deterrence definitions of U.S. force adequacy could actually stimulate nuclear proliferation among allies that lose confidence in the credibility of the U.S. nuclear umbrella. This should be a critical concern. The loss of confidence in the U.S. extended deterrent in Northeast Asia, the Middle East, and even Europe could trigger a cascade of nuclear proliferation. This was the concern expressed in the 2007 State Department International Security Advisory Board report.<sup>221</sup>

### ***Minimum Deterrence Rejects Damage-Limitation Capabilities***

Minimum Deterrence also recommends strongly against significant U.S. strategic “counterforce” and defensive capabilities such as national ballistic missile defense because they could appear to provide a measure of protection for U.S. society in the event deterrence fails, and thereby create “crisis instability.” It is for this reason that Minimum Deterrence proponents typically reject such capabilities as “destabilizing” and inconsistent with their vision of deterrence.<sup>222</sup>

This basic Minimum Deterrence rationale for opposing U.S. national missile defenses can be seen in the Obama administration’s resistance to an expansion of the current rudimentary missile defense capabilities,<sup>223</sup> and its constant reassurances to Russia and China that U.S. defenses will not attempt to interfere with their ability to threaten the United States with nuclear weapons.<sup>224</sup>

What Minimum Deterrence advocates overlook is the potential value of these capabilities in the post-Cold War era. Counterforce, missile defense, and other damage-limiting capabilities can enhance deterrence by denying an adversary the ability to threaten, and thereby coerce, the United States and its allies or to employ its weapons successfully to achieve some valued goal. The ability to deny an adversary its goals through nuclear weapon use has long been a component of U.S. deterrence strategy.<sup>225</sup>

Damage-limiting capabilities can also be of value in the event that deterrence fails. Deterrence may fail for a range of reasons that cannot reliably be precluded now or in the future; if deterrence does fail, reducing damage to U.S. society and allies will be the highest national priority. During the Cold War, many considered this to be a hopeless goal given the very large Soviet nuclear arsenal. However, in the post-Cold War era there are multiple sources of limited

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and emerging WMD threats against which U.S. damage-limiting capabilities could provide a meaningful measure of protection.

Also, if deterrence fails, advocates of Minimum Deterrence appear to have given little thought to what flexible nuclear weapon capabilities might be desirable to limit further escalation. In such a situation, it would be irresponsible not to have all plausible means available to try to deter further WMD use and prevent or limit further destruction, including a wide range of limited nuclear threat options.<sup>226</sup>

These realities argue for counterforce and damage-limiting capabilities where practicable. Yet, as noted, Minimum Deterrence typically recommends against them, in part on the basis of its unsupportable promise that deterrence via threats to societal assets will work predictably and “not much is required to deter.”<sup>227</sup>

### **Summary**

Available evidence demonstrates that, under current conditions, properly including the U.S. national policy objectives of assurance and damage limitation in force-sizing considerations could result in U.S. forces that are larger in number and much more diverse than deemed necessary by Minimum Deterrence—which considers pre-war deterrence as the sole basis for measuring U.S. force requirements. But prudent support for key U.S. objectives should not be a casualty of Minimum Deterrence proponents’ modus operandi of measuring U.S. strategic requirements solely according to their definition of deterrence.



*“Look boys. They couldn’t hit an elephant at this range.”*

*Union General John Sedgwick  
(Moments before he was killed by a Confederate sharpshooter)*

**5. Because ballistic missile submarines are invulnerable, a small SSBN fleet can provide most or all of the nuclear capability needed for U.S. deterrence needs, now and in the future.**

According to most Minimum Deterrence presentations, U.S. nuclear deterrence requirements can be met with a relatively small number of deployed forces based entirely or mostly on SSBNs armed with SLBMs. These Minimum Deterrence proposals rely heavily on the expressed belief that SSBNs are invulnerable and will remain so for decades. This assumption allows Minimum Deterrence proposals to recommend that most or all of U.S. deployable nuclear warheads be based on a small number of SSBNs, and that one or both of the other legs of the nuclear triad be reduced or eliminated.

For example, the *Global Zero* report relies on the assumption of continued SSBN invulnerability for the next three-to-five decades to reduce the number of SSBNs to ten and make deep cuts in U.S. nuclear force modernization plans, including elimination of the U.S. ICBM force.<sup>228</sup> A more recent Minimum Deterrence proposal recommends reducing the number of SSBNs to eight.<sup>229</sup>

The Minimum Deterrence emphasis on a reduced number of SSBNs and the elimination of one or more legs of the triad clearly is based on the presumption of SSBN survivability for decades. One proposal expressed this proposition this way: “The submarine force would offer a high degree of survivability for many decades—no peer competitor currently has any effective anti-submarine warfare capability against U.S. SSBNs at sea and technological breakthroughs that could threaten this survivability are several decades away.”<sup>230</sup>

### **Stubborn Facts**

If the U.S. deployed nuclear force consists primarily of a small number of submarines at sea, the ability to locate and track those submarines would likely become an even higher-priority goal for some future opponents. An adversary might then focus more of its resources on developing operational innovations and anti-submarine warfare (ASW) capabilities directed against U.S. SSBNs. With a Minimum Deterrence force structure based largely or solely on a small number of U.S. SSBNs, if an adversary could track, and then neutralize, the few SSBNs at sea, that adversary would have tremendous leverage over the United States. The detailed technical information on this subject is highly classified and cannot be discussed in this report. What can be addressed is the uncertainty and risks associated with relying heavily or exclusively on a single capability—the next-generation ballistic missile submarine now in conceptual development—and assuming no technical breakthroughs by adversaries that could compromise the SSBN force throughout the projected service life of these submarines.

Some who favor reducing costs associated with U.S. nuclear forces claim that no threat to U.S. submarines exists now or is likely to develop in the foreseeable future. For example, one naval officer writing in the *U.S. Naval Institute Proceedings* notes, “The range of Trident missiles and the extremely low acoustic signatures of the *Ohio* class reduced the threat of ‘strategic ASW’ to



essentially nil.”<sup>231</sup> Such confident assertions may well be valid at present, but no one knows what technical breakthroughs will occur in the decades ahead. The possibility of such a breakthrough, however remote, is one reason why the diversity of the triad is important for U.S. deterrence considerations.

Assuming the absence of technology breakthroughs and innovation in any area of warfare, such as ASW, over the next half century seems foolhardy. One need only look back in time to be awed by the surprising transformations in military combat over much shorter periods of time. For example, in World War I, airplanes were configured with multiple wings as biplanes or triplanes, carried very small bombs, and played a minor role in the war. Slightly more than two decades later, military aircraft played a major role in World War II: 1) the Battle of Midway—the turning point in the Pacific—was fought primarily by high-performance propeller aircraft from aircraft carriers; 2) multi-engine bombers delivered the newly-developed atomic weapons that ended the war between Japan and the United States; and, 3) in Europe, the British used operational innovation coupled with the recent breakthrough in radar technology to direct its fighters toward incoming German bombers. Britain also employed radio beacons to guide British bombers to target areas during night bombing raids over Germany. We cannot know what military-related technical breakthroughs and other innovations adversaries will achieve over the next five decades. We can, however, guard against a breakthrough being catastrophic by diversifying U.S. military capabilities.

Senior Navy leaders have provided some insight into the high priority they attach to protecting the stealthiness of U.S. SSBNs and concern over unknown developments in the future. In 2012, the Chief of Naval Operations, Admiral Jonathan W. Greenert, said, “The rapid expansion of computing power also ushers in new sensors and methods that will make stealth and its advantages increasingly difficult to maintain above and below the water.”<sup>232</sup> The Navy’s Director of Submarine Warfare, Rear Admiral Barry Bruner, explained further: “The threat is not so much from traditional sonar as from ‘non-acoustic’ systems, like magnetic detectors that can find the metal hull or satellites that can peer below the surface of the water.”<sup>233</sup>

In contrast, Minimum Deterrence advocates essentially deny threats to SSBN survivability for decades to come. Only a footnote in the *Global Zero* report acknowledges that this assumption may not hold true: “There are potential threats on the distant horizon (30-50 years in the future) that could dramatically alter this prognosis. Foremost among them is the prospect that sophisticated sensors coupled to supercomputing with advanced data filtering could strip away enough of the ocean’s masking characteristics to expose the submerged boats.”<sup>234</sup> The planned service life of the next-generation SSBNs extends to 2080—well beyond the “distant horizon” identified by the *Global Zero* report. Its Minimum Deterrence definition of U.S. force requirements appears not to take into consideration even the possibility of a need to hedge against technical developments and operational innovations which could invalidate this key planning assumption—SSBN invulnerability. Given uncertainties regarding technical developments in the future, this presumption of invulnerability for the next 30-50 years appears to be based on a measure of hope.

### ***What Are the Risks if the Assumption of SSBN Invulnerability Proves False?***

A former commander of Strategic Command has written on the attributes needed in the future nuclear force. The first attribute on his list is *survivability*, which is key to the resilience of U.S.

forces. His reasoning is straightforward: as a greater share of the eggs is placed in fewer baskets, survivability becomes more and more important.<sup>235</sup> Assessing risk involves identifying the security implications if the Minimum Deterrence presumption of continued SSBN invulnerability for many decades proves to be wrong, particularly including the U.S. actions required to maintain a prudent measure of overall nuclear force survivability. To illustrate the risk, one can compare an adversary's task of neutralizing a Minimum Deterrent force relying heavily or exclusively on a small number of SSBNs with the same task for a more diverse nuclear force.

Take, for example, the proposed nuclear force structure of the *Global Zero* report. It consists of only ten SSBNs and ten nuclear-capable B-2 bombers.<sup>236</sup> Support bases for this force would be limited to at most three sites—one or two SSBN bases and a single B-2 air base. If the small number of SSBNs at sea could be destroyed or neutralized by an adversary, the entire remaining U.S. nuclear force would be concentrated at two or three bases. A small WMD attack on these bases could eliminate all or most of the strategic nuclear retaliatory capability of the United States. Even a terrorist attack with chemical weapons or radiation dispersal devices might immobilize these forces for a significant period of time.

The existing two SSBN bases at Kings Bay, Georgia and Bangor, Washington were initially designed to be able to support at least ten SSBNs at each base. If the total number of SSBNs is reduced to ten or fewer—as called for in several Minimum Deterrence proposals—there would likely be pressure to consolidate all of the SSBNs at a single base—probably Bangor—for cost efficiency. With the U.S. nuclear force composed primarily of SSBNs and all SSBN support operations consolidated at a single base, opponents of the United States could be highly motivated to develop nuclear or non-nuclear methods to attack this single base and thereby reduce severely any potential U.S. retaliatory nuclear deterrent threat.

In contrast, for an adversary to try and destroy U.S. nuclear forces in a more diverse nuclear force posture, such as that currently planned by the United States under the New START Treaty, a major nuclear strike involving at least 400 to 500 nuclear warheads would be required, largely because of the significant number of silo-based ICBMs. No matter how well-planned the attack, the adversary could expect some U.S. nuclear forces to survive. As a result, the adversary could then expect a nuclear response from the United States—a response that would be beyond the adversary's control or confident calculations. This potential U.S. response capability is perhaps the best means of helping to discourage a challenger from imagining that striking at the United States could be a useful strategy option under any circumstances.

As illustrated above, if an adversary could track and then neutralize the small number of U.S. SSBNs at sea, then that adversary would have tremendous leverage over the United States during times of conflict. With too many eggs in the SSBN "basket," even the loss of one SSBN at sea could be alarming.

If in the future, U.S. leaders become aware of an adversary's technical ASW breakthroughs, that knowledge would assuredly trigger an urgent and expensive crash program to reestablish some degree of survivability for the nuclear force. Emergency efforts could include dispersing nuclear-capable bombers to other airfields, keeping some bombers on alert, and an urgent development and acquisition program to reestablish an ICBM capability (which could take a decade or more). One way to hedge against such a possibility is to retain a more diverse

nuclear force, including ICBMs and nuclear capable bombers, in addition to SSBNs. Maintaining diversity in the nuclear force at the very low force levels of Minimum Deterrence, however, appears largely impracticable.

### ***What Capabilities Would Be Lacking in a Deterrent Force Composed Mostly or Entirely of SSBNs?***

The next test is to examine the U.S. options and nuclear capabilities that would be absent with a deterrent force based largely or exclusively on SSBNs, and identify the potential implications for U.S. deterrence goals and the assurance of allies.

*Flexibility and Resilience.* If in the future, new and different types or deployment of a greater number of nuclear weapons are needed for deterrence and assurance, the U.S. nuclear force structure and infrastructure must be able to meet that need. Yet, heavy reliance on only one kind of nuclear weapon, such as ballistic missiles on SSBNs, would severely limit the options available to defense planners.

Of the three legs of the nuclear triad, SLBMs are the nuclear delivery vehicles which have the greatest constraints on the weight and volume for nuclear payloads. Bomber-delivered nuclear weapons can, in general, be heavier and larger in size than those carried by either ICBMs or SLBMs. For example, one special-purpose nuclear weapon currently carried by heavy bombers is the B61-11 earth penetrating weapon (EPW)—the only earth penetrating nuclear weapon in the U.S. inventory. Currently, several constraints involving both carriage (i.e., weight and volume) and delivery reportedly prevent EPWs from being adapted to SLBMs.<sup>237</sup> It cannot reasonably be predicted that such capabilities will be unimportant for deterrence now and in the future.

*Assured Communications.* ICBMs have been valued because of the assured communications channels between the president and these weapon systems. In contrast, the SSBN fleet must rely on the accurate receipt of securely transmitted messages to submerged submarines. In the contemporary environment, cyber attacks, communications disruption (including, but not limited to, anti-satellite operations), insider threats, and data contamination are becoming increasingly potent. Communications with strategic forces are not completely immune to these developments. However, as the strategic force posture is reduced in size and diversity, interference with any single remaining leg could have strategic effect.

If an adversary discovered a method to interfere with and prevent receipt of secure messages transmitted to SSBNs at sea, the deployed SSBNs could be of little value. In that case, ICBMs with secure communications could become particularly important for deterrence.

*Enemy Planning.* Currently, an adversary considering how to defeat or defend against U.S. nuclear capabilities has to consider several diverse types of U.S. weapons—including ICBMs, SLBMs, heavy bombers with gravity bombs and cruise missiles, and possibly dual-capable aircraft. Trying to execute a disarming strike that would neutralize all or most U.S. nuclear capabilities would require a complex attack with many hundreds of nuclear weapons. For those surviving U.S. weapons, the adversary would have to be able to defend successfully against incoming warheads from ballistic missiles and from guided weapons such as cruise missiles.

This diversity of U.S. weapon types greatly complicates enemy planning, which may be key to effective deterrence in some cases. If the U.S. nuclear force was essentially reduced to a skeletal retaliatory force, such as that typically proposed by Minimum Deterrence, enemy planning for both offense and defense would be greatly simplified—with potentially adverse consequences for U.S. deterrence goals.

### **Summary**

In summary, there is risk in assuming confidently that adversaries will not develop technical and operational capabilities to detect and track U.S. submarines at sea, and that these submarines, when at sea, will be invulnerable for up to five decades. This assumption, common to most Minimum Deterrence proposals, provides a basis for recommending significant reductions in nuclear forces and, correspondingly, the elimination of the triad. In taking this position, Minimum Deterrence proponents appear to ignore the potentially serious risks associated with the possibility that their prediction will prove wrong. Democratic and Republican administrations alike have sustained a triad for decades, in part to hedge against just that risk.



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*"To spell out the obvious is often to call it into question."<sup>238</sup>*

*Eric Hoffer*

**6. The number of nuclear weapons and the risk of nuclear use are directly correlated (more nuclear weapons means increased risk, while a decrease in their number reduces the risk).**

Proposals for a Minimum Deterrence force typically emphasize a recommended number of nuclear weapons (missile warheads and air-delivered bombs) rather than the characteristics of those weapons (yield, reliability, effects) or their means of delivery (ballistic missiles, cruise missiles, heavy bombers, shorter-range strike aircraft). This focus on weapon quantity rather than force qualities in part reflects the view that the enormous destructive power of nuclear weapons creates a deterrent effect that is largely independent of details, other than the specified number of warheads and bombs. But it also reflects the notion that the number of nuclear weapons is the principal determinant of the dangers they pose. The belief is that, as the number of weapons increases, the risks of nuclear war, accidents and theft likewise increase; conversely, weapon reductions, especially to a Minimum Deterrence level, will lessen these risks. According to the Nuclear Threat Initiative, an organization that favors deep reductions on the path toward a nuclear-free world, "the continued presence of large stockpiles makes the accidental or unauthorized use of nuclear weapons a persistent risk."<sup>239</sup> In advocating significant cuts in the nuclear forces of the United States and Russia, an analyst at the Center for Arms Control and Non-Proliferation similarly warns, "The more nuclear weapons and material there is around the world, the greater the chances weapons or material could be stolen by terrorists and the greater the risks of unauthorized, miscalculated, or accidental use of nuclear weapons."<sup>240</sup>

### **Stubborn Facts**

The asserted relationship between nuclear numbers and nuclear dangers is not borne out by historical data from the decades of the U.S.-Soviet Cold War. For the period 1945 to 1989—the advent of the atomic bomb through the fall of the Berlin Wall—Figure 4 shows the numbers of weapons in the U.S. and Soviet nuclear arsenals, the numbers of reported nuclear weapons-related accidents on both sides, and the international events during which the day-to-day status of U.S. or Soviet nuclear forces was changed (these episodes offer a rough index of an increased risk of conflict). The number of nuclear weapons in the figure includes strategic and non-strategic ("tactical") weapons, offensive weapons and defensive weapons (warheads carried by air defense missiles, for example), and deployed and non-deployed weapons. The number of accidents counts those involving nuclear weapons, nuclear weapon components, vehicles and platforms capable of delivering nuclear weapons, and conveyances used to transport nuclear weapons. Events in which the readiness of nuclear forces was enhanced include cases where: aircraft assumed a stand-down posture to improve operational preparedness, went on increased ground or airborne alert, dispersed from home bases to alternate airfields, or deployed to overseas locations; aircraft or missiles were armed with weapons; land-based missiles moved to a higher alert level; or additional ballistic missile submarines went on patrol or to their launch positions. The arsenals, accidents and events shown in the figure are described more fully in the Appendix.

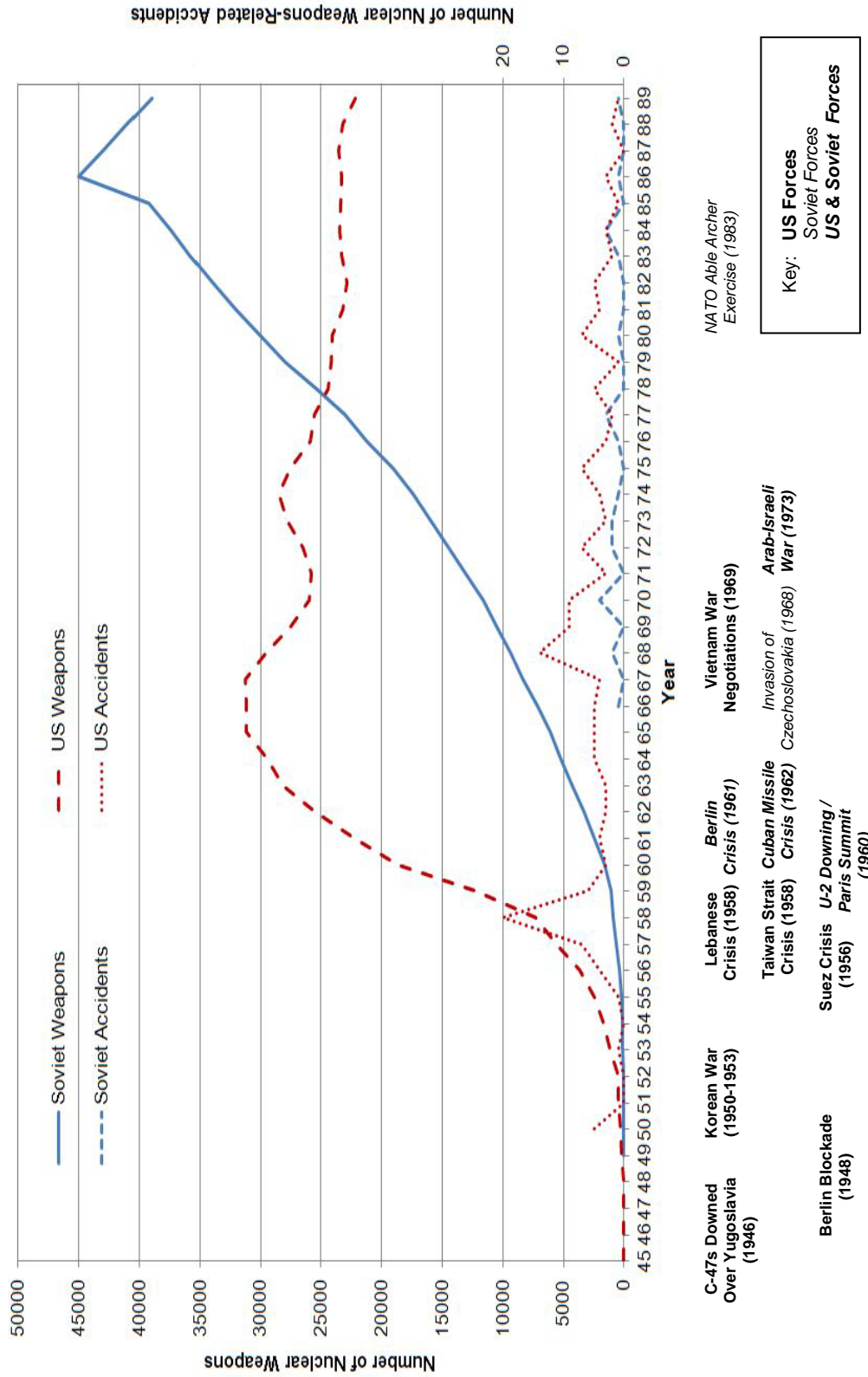
### ***Weapon Numbers and Accidents***

Before the relationship between number of nuclear weapons and number of accidents is examined, the meaning of “nuclear weapons-related accidents” should be clearly understood. Two types of accidents are included in this category. The first type are those the Department of Defense (DoD) has defined as “accidents involving nuclear weapons.” These include “non-nuclear detonation or burning of a nuclear weapon or radioactive weapon component, including a fully assembled nuclear weapon, an unassembled nuclear weapon, or a radioactive nuclear weapon component,” “radioactive contamination,” “loss of a nuclear weapon or radioactive nuclear weapon component, including jettisoning,” and “public hazard, actual or implied.” In 1981, DoD reported that, by this definition, there had been 32 accidents between 1950 and 1980. These are the most significant of those counted in Figure 4. Most resulted from aircraft malfunctions and crashes. None, it is important to note, caused a nuclear detonation.<sup>241</sup> A number of open-source reports describe similar accidents involving Soviet nuclear weapons, but there is no official Soviet or Russian list that is comparable to the DoD account and is publicly available.<sup>242</sup>

The second type are not included on the DoD list of accidents. They are drawn from an open-source list of mishaps involving aircraft, missiles, surface ships or submarines that could have been armed with nuclear weapons when the mishaps occurred, and also those involving conveyances used to transport nuclear weapons. In these cases, sources indicate the incidents took place, but are not definitive as to whether nuclear weapons were involved or suffered damage. No nuclear detonation was caused by any of these incidents.<sup>243</sup> They are included in this analysis and labeled “nuclear weapons-related accidents,” but should not necessarily be considered comparable to the occurrences identified on the DoD list of accidents. Most of the U.S. and Soviet incidents tallied in the figure are of this second type.

Even with the broad definition used here, the data depicted in the figure indicate no direct correlation between number of nuclear weapons-related accidents and number of nuclear weapons. (Note the huge disparity in the scales for weapon numbers and accident numbers, with the left-side vertical axis measuring weapons in the thousands and the right-side axis measuring accidents in single or low double digits.) As Figure 4 shows, the United States had the same number of accidents, five, in 1950, 1964, and 1982, while the numbers of weapons for those years varied considerably—roughly 300, 29,000, and 23,000, respectively. The numbers of U.S. weapons and accidents both increased between 1955 and 1958, but as the number of weapons then continued to increase markedly over the next several years—from around 12,000 in 1959 to some 31,000 in 1967—the number of accidents decreased and remained essentially flat, varying between three and six each year during that period. Accidents went up from four in 1967 to 14 the next year and nine in each of the two subsequent years, while weapons went down from the peak of 31,000 to 26,000 in 1970. For the rest of the Cold War, U.S. accidents fluctuated between zero and seven a year (an average of three per year), as the number of

Figure 4. Nuclear Numbers and Nuclear Dangers



Events Involving Increased Readiness of Nuclear Forces



weapons increased to approximately 28,000 in 1974 and then gradually declined to somewhat more than 22,000 in 1989. In the Soviet case, the number of weapons steadily increased, from the single weapon tested in 1949 to the 40,000 or more weapons that comprised the arsenal in the late 1980s, while the number of accidents, according to unclassified sources, never exceeded four per year between 1966 and 1989. Based on the Cold War experience, then, the risk of nuclear weapons-related accidents appears unaffected by the number of nuclear weapons.

### ***Weapon Numbers and International Events***

Nor was the number of nuclear weapons a determinant of the likelihood of events in which the readiness of nuclear forces was raised.<sup>244</sup> In the preceding figure, events during which the United States increased force readiness appear in boldface, those involving Soviet nuclear forces are in italics, and events where both sides enhanced readiness are boldfaced and italicized. Three of these events—the downing of U.S. C-47 air transports over Yugoslavia, the Berlin blockade, and the Korean War—happened when the U.S. nuclear arsenal was relatively small (nine weapons in 1946, 50 in 1948, and fewer than 1,200 in the early 1950s, respectively) and the number of Soviet weapons was even smaller (none in 1946 and 1948, and 120 or fewer in the early 1950s), while almost no events—the Soviet reaction to the NATO Able Archer nuclear release command post exercise being the exception—occurred from the late 1970s through the late 1980s, years when each country had more than 20,000 weapons. Six events took place during a period (1956-1962) when the U.S. nuclear arsenal grew rapidly and the smaller Soviet arsenal also increased, although at a slower rate. But there was the same number of events, two, in 1958, when the United States had a little over 7,000 weapons and the Soviet Union had somewhat fewer than 1,000, as there was in 1961-1962, when the U.S. count exceeded 20,000 weapons and the Soviets had roughly 3,000. While the alert of some Soviet nuclear forces during the 1968 Moscow-led invasion of Czechoslovakia occurred as the number of Soviet nuclear weapons was increasing, the U.S. nuclear alert the next year, which was intended to give an impetus to the Vietnam peace negotiations, took place when the number of U.S. nuclear weapons was declining. Both sides alerted their nuclear forces during the 1973 Arab-Israeli War, a time when the total number of U.S. nuclear weapons was nearly twice that of the Soviet Union. In short, the figure offers little or no support for the view that more nuclear weapons per se means a greater risk of confrontation, or that reducing nuclear arsenals will lessen the risk.<sup>245</sup>

### ***Reasons for Lack of Direct Correlation***

It should not be surprising that weapons-related accidents and occasions of increased nuclear readiness are not directly correlated with weapon numbers. Design deficiencies, technical malfunctions, and hazardous activity of the delivery means for nuclear weapons, along with human error, were the causes of the accidents plotted in the figure, not the weapons themselves or their numbers. Several Soviet accidents, for example, involved submarine fires or explosions that may have been attributable to design flaws or inadequate crew training.<sup>246</sup> In another case, a U.S. air defense missile and its nuclear warhead were destroyed when an on-board helium tank exploded and set fire to the missile fuel. A number of other U.S. accidents occurred during airborne alert operations, which ended as a standard practice in 1968, in part because of two bomber crashes that resulted in widespread dispersal of nuclear material. And,

in an accident involving a U.S. silo-based, liquid-fueled ballistic missile, a repairman dropped a heavy wrench, which struck the missile, causing a fuel leak, which later produced an explosion that threw the missile warhead some distance from the silo.<sup>247</sup> (This missile type subsequently was deactivated.) Both sides adopted various measures to prevent accidental detonations, including arming and safing mechanisms incorporated into the weapons themselves.<sup>248</sup> Changes in some of the operational practices for U.S. nuclear forces, such as the termination of routine airborne alert by part of the bomber force, reduced the opportunities for accidents.

The events arrayed at the bottom of Figure 4 were unconnected with the numbers of U.S. or Soviet nuclear weapons. They arose from superpower competition, heightened tensions, international disputes, military moves, and armed conflicts, not metastasizing nuclear stockpiles. While a perceived need to offset U.S. nuclear superiority was one of the motives behind the Soviet deployment of nuclear missiles to Cuba in 1962, it was the imbalance between the nuclear forces of the two sides, not the absolute number of U.S. nuclear weapons, that was of critical importance.<sup>249</sup> A military buildup, whether in armored vehicles, combat aircraft, missiles, warships, or nuclear weapons, can be a source of tension between states, but, at a more fundamental level, reflects tensions that already exist. The interplay of geopolitical rivalry, internal politics, military requirements, technological developments, and economic wherewithal determined U.S. and Soviet weapon numbers; weapon numbers did not determine the course or cause the crises of the Cold War competition.

### ***Weapon Numbers and Unauthorized Use, Theft and False Warning***

What of the claim that more nuclear weapons make for greater risks of unauthorized use or theft? These dangers are not shown in the figure for the simple reason that there are no known incidents of theft, and clearly no cases of unauthorized use, for either the United States or the Soviet Union, even for those years when each had tens of thousands of weapons. The risks here are less a function of weapon numbers than of the effectiveness of organizational, procedural and physical safeguards for preventing unauthorized use or theft. Fifty, not 500 or 5,000, weapons were in the U.S. nuclear stockpile when President Truman, during the Berlin blockade, expressed his determination to exercise tight control over the use of atomic bombs and his concern not “to have some dashing lieutenant colonel decide when would be the proper time to drop one.”<sup>250</sup> The United States, in the following years, put into effect precautions to minimize the risk of unauthorized nuclear use, including authorization codes for nuclear release, the two-man rule for personnel with nuclear responsibilities, and permissive action links (electromechanical locks) on nuclear weapons.<sup>251</sup> The Soviet Union instituted similar safeguards as well as others that differed from U.S. practice.<sup>252</sup> To prevent theft, the United States protected its nuclear weapons facilities with a combination of controlled access, physical barriers, intrusion detection systems, and armed security forces.<sup>253</sup> The Soviet Union likewise employed a “multi-layered approach” comprising “physical, procedural, and technical measures.”<sup>254</sup> When the perceived risk of unauthorized use or theft of Russian nuclear weapons increased in the 1990s, this was not because of an increase in the number of weapons—which in fact was going down<sup>255</sup>—but because the Soviet collapse, in various ways, weakened the control and security of the nuclear arsenal. On the other hand, the consolidation of the Russian stockpile at fewer sites—from approximately 500 storage facilities before 1991, to about 90 by the end of the 1990s, and an estimated 48 in 2009—helped mitigate the risk of theft, independent of the reduction in weapon numbers.<sup>256</sup>

False warning is something else that could lead to unintentional nuclear use. In June 1980, for example, warning displays at key U.S. command posts showed that a Soviet ballistic missile attack was underway. Some steps were taken to increase the ability of U.S. strategic nuclear forces to survive a first strike. It was quickly established, however, that the warning was false. Later investigation revealed the incident was caused by the failure of an integrated circuit chip in the computer system at the North American Aerospace Defense Command.<sup>257</sup> On the Soviet side, in September 1983, a newly operational early warning satellite system indicated the launch of a handful of U.S. intercontinental ballistic missiles. The officer in charge at the control center receiving the data determined the launch indications were likely erroneous. Subsequent analysis pointed to the chance alignment of one of the satellites, the sun, and reflected light from cloud cover as the cause of the false alarm.<sup>258</sup> Neither these cases nor others were connected with the numbers of nuclear weapons in the U.S. and Soviet arsenals. They were problems related to early warning capabilities and command-and-control arrangements. The requirement for “dual phenomenology”—confirmation of an incoming missile attack by two different types of sensors—can reduce the risk of nuclear retaliation on the basis of false warning. Nonetheless, similar incidents could recur whether nuclear forces remain at current levels or are reduced to that associated with Minimum Deterrence. A Minimum Deterrence force, though, could create a greater risk of nuclear use if its smaller size and less diverse composition made its prelaunch survivability more dependent on attack warning—which could prove false.

### **Summary**

Nuclear accidents, crises, thefts and false alarms can be serious dangers. The Cold War experience offers evidence that they are not caused by increases in the numbers of nuclear weapons and would not be diminished by decreases to the Minimum Deterrence level. Those who claim otherwise have yet to describe the causal links between numbers and risks or to adduce evidence supporting their position. The problems they identify are real, but their solution is wrong. What can be said with some confidence is that reductions in the numbers of nuclear weapons would decrease their aggregate destructive potential. But Minimum Deterrence advocates generally show little interest in limiting the damage from nuclear war if deterrence fails—one of the original objectives of arms control<sup>259</sup>—because they stake virtually everything on such an event never happening and make no real distinction among the different levels of destruction such a conflict could produce.

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*“Article VI [of the Non-Proliferation Treaty] commits all parties to pursue negotiations in good faith relating to a cessation of the arms race and to nuclear disarmament. This is an essentially hortatory statement and presents no problems.”*

*Spurgeon Keeny  
Memorandum for Dr. Kissinger, January 24, 1969*

## **7. Nuclear force reductions provide essential support for non-proliferation and arms control efforts.**

Minimum deterrence proponents assert that lowering reliance on nuclear weapons and adopting very low force levels would encourage—or even be essential to—nuclear non-proliferation and further negotiated nuclear arms reductions. These claims assume the existence of a strong, and specific, cause-and-effect relationship between the United States’ nuclear force posture and other countries’ strategic choices on nuclear weaponry. In this purported relationship, other countries’ interest in acquiring or keeping nuclear weapons is directly proportional to the size of the American arsenal. In other words, it is assumed that others will lose interest in possessing nuclear weapons, and become more willing to cooperate with us against proliferation, if and as we reduce or abandon our arsenal. Proponents of this view argue that the reverse also holds true—that a failure to reduce dramatically current nuclear stockpiles would encourage proliferation and discourage further reductions.

This claimed linkage can and must be subjected to careful analysis. Is it true, for instance, that the U.S. nuclear weapons posture is a critical determinant of other countries’ approaches to nuclear weaponry, and that, if so, U.S. cuts would be reciprocated? Is it true that proliferator behavior and other countries’ attitudes toward non-proliferation are influenced by the U.S. posture to such an extent, and in such a way, that a Minimum Deterrence approach would catalyze significantly improved behavior? One must examine the empirical record in order to evaluate the arms control and non-proliferation claims made on behalf of Minimum Deterrence.

### **Stubborn Facts**

As noted, proponents of Minimum Deterrence often claim that, by adopting this approach to nuclear strategy and force structure, the United States will lead the way to progressively deeper negotiated reductions ending in eventual global nuclear disarmament, and persuade actual and potential proliferators to change their ways. In reality, there is no sign of any such beneficial impact or relationship to date, and little if any basis for expecting that U.S. nuclear reductions will have these effects in the future. Indeed, if anything, just the opposite is true. U.S. adoption of a minimum deterrence force structure and strategy could both impede negotiated arms reductions and fuel proliferation.

### ***Preventing Proliferation***

**Legal Arguments.** Many Minimum Deterrence advocates maintain that U.S. nuclear reductions to a few hundred warheads or even lower, will help to dissuade potential proliferators from acquiring nuclear weapons, and to persuade actual proliferators to abandon their programs.

Most argue further that the NPT firmly links the non-proliferation pledge of the non-nuclear weapons states to a denuclearization obligation for the five nuclear weapons states.

The widespread belief in that “NPT bargain,” which has spread beyond Minimum Deterrence advocates, is actually very recent. Article VI of the NPT provides: “Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control.” In January 1969, a senior National Security Council staff member explained to new National Security Advisor Henry Kissinger that Article VI was “an essentially hortatory statement and presents no problems.”<sup>260</sup> While the Preamble to the Treaty is not legally binding, it does provide a guide to the original intent of the Parties; the Preamble clearly conditions nuclear disarmament on general and complete disarmament, describing the first as pursuant to the second.<sup>261</sup> Indeed, one could well argue that Article VI places less importance on nuclear disarmament than on general and complete disarmament, calling for a treaty on the latter, but only “effective measures” on the former. There is no question that, at least, they are equal obligations under Article VI.

The 1995 NPT Review Conference that decided on the indefinite extension of the Treaty paid more attention to Article VI than the Parties did initially. However, its primary focus was still on the need for compliance and universality, and it also retained the link between the two elements of Article VI. Thus, the text of the 1995 Review Conference decision on indefinite extension affirmed:

...that there is a need for full compliance with the Treaty, its extension and its universal adherence, which are essential to international peace and security and the attainment of the ultimate goals of the complete elimination of nuclear weapons and a treaty on general and complete disarmament under strict and effective international control.<sup>262</sup>

In subsequent years, many NPT Parties, including many American officials and observers, completely flipped positions on the relationship between non-proliferation and nuclear arms reductions. In doing so, they came to argue that non-proliferation depends on nuclear reductions, rather than the reverse. President Obama’s famous Prague speech in April 2009 was the first official U.S. Government statement to endorse this interpretation of Treaty requirements: “The basic bargain [of the NPT] is sound: Countries with nuclear weapons will move toward disarmament, countries without nuclear weapons will not acquire them, and all countries can access peaceful nuclear energy.”<sup>263</sup>

The 2010 NPT Review Conference went even further. Its Final Document omits any reference to linkages between compliance and nuclear abolition or between nuclear and general and complete disarmament. Instead, it cites a supposed “*unequivocal* undertaking by the nuclear-weapon States to accomplish the total elimination of their nuclear arsenals” (emphasis added), and calls for further reductions.<sup>264</sup> President Obama’s endorsement of the supposed nuclear disarmament/non-proliferation bargain in the NPT undoubtedly had a major impact on the wording of the Final Document. The 2010 Review Conference was also impervious to the U.S. submission of data on the size of the U.S. stockpile between 1964 and 2009—data which showed that the number of U.S. nuclear weapons had fallen by 84 percent since their 1967

peak (from 22,217 to 5,113), and by 50 percent during the supposedly-anti arms reduction George W. Bush administration (from 10,526 in 2001 to 5,273 in 2008).<sup>265</sup>

**Political Realities.** Debates about the legal standing of a supposed disarmament/non-proliferation bargain in the NPT are less important than the political environment: the amount and importance of the pressure placed, respectively, on nuclear weapons states to reduce their arsenals and on non-nuclear weapons states to remain in compliance. It has escaped general notice that, by claiming that the nuclear-weapon states have an unconditional obligation to disarm, the 2010 NPT Review Conference dropped the idea of a Treaty bargain, and in essence argued that there is no relationship between nuclear reductions and non-proliferation. In that one regard, at least, they were right.

It is sometimes claimed that fear of U.S. nuclear weapons lies behind the ambition of countries like Iran or North Korea to acquire nuclear weaponry—and that American nuclear reductions will therefore help to reduce proliferation pressures. In reality, however, there is no evidence that U.S. nuclear reductions help to encourage non-proliferation. If anything, just the opposite is true.

First, U.S. validation of the basic premise of Minimum Deterrence—namely, the notion that even the greatest of powers can be deterred by a very small nuclear force—might actually *encourage* proliferation, for this is just what such regimes seek to do to the United States, even while lacking the means to acquire a large arsenal. Since the fall of the Berlin Wall in 1989, for instance, the United States has reduced the size of its nuclear arsenal by some 75 percent.<sup>266</sup> This same period, however, has coincided with the acceleration of the North Korean and Iranian nuclear programs, as well as the emergence of both India and Pakistan as weapons possessors. North Korea, moreover, began developing its arsenal in the early 1990s, just after U.S. tactical nuclear weapons had been removed from South Korea.

Further, to the extent that fear of American military power features in the proliferation incentives perceived by the ruling regimes in countries such as North Korea and Iran, U.S. conventional power likely has much more impact than nuclear capabilities. If this is so, Washington's adoption of a Minimum Deterrence posture might actually make proliferation more attractive, if American policies of "reducing reliance upon nuclear weaponry" continue to stress the military value of our advanced conventional weaponry. States like Iran and North Korea know that they could never defeat the United States in a conventional conflict, but may logically believe that they can deter U.S. action against them through possession of even a small nuclear arsenal. Such a belief might only be strengthened if U.S. nuclear forces fell to Minimum Deterrence levels.

Second, many U.S. friends and allies were dissuaded from acquiring nuclear weapons because of the security assurance provided by U.S. extended nuclear deterrence. Some, like Germany, now would be unlikely to "go nuclear" even if that confidence was lost. Others, most notably Japan and South Korea, might react very differently to reduced confidence in the United States umbrella, as France did decades ago.

Faced with escalating North Korean nuclear threats and the prospect of continuing U.S. nuclear reductions, for example, some South Korean politicians have publicly expressed the need to develop indigenous nuclear weaponry in order to "maintain a balance of terror that confronts nuclear with nuclear."<sup>267</sup> (A poll taken in August 2011 revealed that some 62 percent of South

Koreans now support nuclear weapons development.)<sup>268</sup> It was also reported in the Japanese press as early as 2007 that some Japanese defense officials had similar misgivings about U.S. nuclear cuts,<sup>269</sup> which have recently been said to be pushing “some in Japan” into “discussing indigenous nuclear development ... partly due to a lack of confidence in the U.S. extended deterrence.”<sup>270</sup>

Concern that U.S. nuclear reductions could help create a possible “tipping point” for further nuclear proliferation has been expressed by former U.S. Secretary of Defense James Schlesinger,<sup>271</sup> as well as the U.S. State Department’s International Security Advisory Board, which warned that “a lessening of the U.S. nuclear umbrella could very well trigger a cascade [of proliferation] in East Asia and the Middle East.”<sup>272</sup> Ironically, the sort of deep reductions proposed by Minimum Deterrence enthusiasts might indeed actually contribute to nuclear proliferation.

The nuclear arsenals (or reductions thereof) of the five recognized nuclear powers (P-5) seem to have had little impact on the decisions of states to abandon nuclear weapons ambitions. South Africa acquired, and then destroyed, its nuclear weapons for domestic and regional reasons. Military dictatorships in Brazil and Argentina nurtured secret nuclear weapons programs, but they were abandoned as the two countries moved to more democratic rule. Libya did not abandon its nuclear program because of nuclear-weapon state reductions, but out of fear that it could be the next Iraq.<sup>273</sup> Iraq pursued, and Iran continues to pursue, nuclear weapons for regional dominance.

The nuclear decisions of India and Pakistan were influenced to some extent by their respective, and very different, relations with China; however, the major motivating factors were their bilateral, and trilateral, regional tensions. Ultimately, Ukraine, Belarus and Kazakhstan willingly abandoned their nuclear capabilities. Two key factors were Russia’s agreement to destroy the nuclear warheads removed from their territories as a condition of their denuclearization decisions and the understanding that non-nuclear status was essential to a good relationship with the United States and NATO.

**Non-proliferation Cooperation.** Finally, it often is claimed that U.S. nuclear reduction to Minimum Deterrence levels would help galvanize support for non-proliferation among other members of the international community—particularly countries in the developing world—which allegedly can be won over to the cause of non-proliferation if Washington works harder to eliminate its own weapons. There is, however, little or no evidence to support the assertion. So far, the United States seems to have won no significant non-proliferation cooperation as a result of its recent pro-disarmament stance.

To be sure, both Iran and North Korea now face more international sanctions than ever before. Each instance in which sanctions pressures have been tightened has closely followed—and, in public, explicitly been tied to—specific new provocations by the regimes in question. Iran faced additional pressures as it repeatedly defied U.N. Security Council mandates, rejected international diplomatic initiatives, had additional secret nuclear facilities come to light, and began enriching uranium to nearly 20 percent. North Korea faced additional pressures as it withdrew from the NPT, engaged in multiple nuclear tests, launched conventional military attacks upon South Korean forces, and conducted ballistic missile tests in violation of Security Council resolutions. It seems clear that it is the egregiousness of these regimes’ own behavior

that has led directly to tougher sanctions; there is no evidence that recent additional pressures owe anything to U.S. nuclear reductions.

While recent American disarmament positions have been applauded in NPT fora, these positions also appear to have been “pocketed” by diplomatic interlocutors who were spurred thereby to demand *additional* American reductions.<sup>274</sup> Moreover, there has been no particular improvement in other countries’ positions on non-proliferation. If anything, the developing world’s position has worsened in this regard. For example, in August 2012, the Non-Aligned Movement unanimously endorsed the position taken by Iran in its nuclear dispute with the Security Council.<sup>275</sup> Among major powers, Russia and China have, over the past several years, refused or watered down United Nations Security Council sanctions on Iran, North Korea and Syria—acceding only when those states’ behavior worsened considerably.

Moreover, the Final Document of the 2010 NPT Review Conference devoted much more attention to the supposed nuclear disarmament commitment of Article VI than it did to non-proliferation obligations—an imbalance that is difficult to square with the basic purpose, and indeed name, of the Treaty. The section of the 2010 Final Document concerning review of Treaty operation devotes just one page to Articles I and II, and two and one-half pages to Article VI.<sup>276</sup> Its conclusions and recommendations include nearly six pages on nuclear disarmament; only two and one-half pages address nuclear proliferation.<sup>277</sup> There is no mention anywhere in the Final Document of states of proliferation concern such as Iran and North Korea. The 2010 Final Document stands in stark contrast to its 1995 counterpart, which placed primary (and appropriate) emphasis on the requirement for NPT compliance and universal adherence.

### **Arms Control**

There is an inherent inconsistency between the argument of Minimum Deterrence advocates that Russia and China are no longer enemies of the United States or our allies, and their simultaneous support for progressively deeper negotiated nuclear reductions. If we are not in a deterrent relationship with Russia or China and will not be, why seek arms control agreements with them, any more than we do with the United Kingdom and France? The active nuclear modernization programs of both states, their professed perceptions of the United States as an enemy (including concerns about the impact of U.S. missile defenses on their deterrents), and the continuing threats they pose to close U.S. allies in Central Europe and East Asia, respectively, strongly indicate otherwise.

The question remains whether U.S. adoption or advocacy of Minimum Deterrence would lead to, or even facilitate the likelihood of, negotiated deep nuclear reductions with Russia and China. There is no basis in past experience for such a belief, nor any reason to believe that it would emerge in the foreseeable future. The rest of the world frequently fails to follow the U.S. lead on such issues. Instead, countries appear to base decisions on their own perceived security needs and values; the American “good example” counts for very little.

One of the most important examples is the fate of the unilateral/reciprocal Presidential Nuclear Initiatives (PNI) of 1991-1992. The United States announced unprecedented, unconditional reductions, coupled with a challenge for the Soviet Union (and then Russia) to reciprocate. Presidents Mikhail Gorbachev in 1991 and Boris Yeltsin in 1992 accepted that challenge. However, there is considerable evidence from open Russian publications that the Soviet Union



and Russia never actually implemented the promised reductions.<sup>278</sup> Between 1991 and 1994, the United States nuclear warhead stockpile dropped by 50 percent—the greatest absolute and percentage reductions in U.S. history. Moreover, the United States never developed new weapons to replace those reduced or eliminated.<sup>279</sup> Indeed, as a result of the 2010 Nuclear Posture Review, the United States decided to go beyond the PNIs by eliminating the remaining naval nuclear cruise missiles (TLAM-N) that had been in storage since 1991. It does not appear that Russia fully followed suit, in either the initial reductions or later replacement of eliminated or outmoded weapons.

In another example, the United States, United Kingdom and France have observed moratoria on nuclear explosive testing since 1992. Russia and China have claimed to do so as well. This restraint, however, has not kept India, Pakistan, and North Korea from conducting nuclear tests. Nor, apparently, has it kept Russia and possibly China from apparently conducting low-yield nuclear explosive tests.<sup>280</sup> Moreover, the United States has declined to develop or produce any new nuclear warhead type for the last two decades. Russian officials, however, admit developing new warheads for multiple missile systems, including advanced low-collateral-damage and precision low-yield devices.<sup>281</sup> For its part, China reportedly made significant advances in warhead miniaturization in the 1990s, and has been testing missiles such as its DF-21 and DF-31—as well as the new submarine-launched JL-2—with multiple small new warheads.<sup>282</sup>

There is as yet no evidence that U.S. efforts to “lead the way” toward deep nuclear weapons reductions will prove any different from these historical examples. All nuclear weapon states have moved openly to modernize their nuclear forces. However, while the United States has announced strategic delivery vehicle modernization programs, it has repeatedly delayed them. The same is true of the United Kingdom. Just the opposite is the case for Russia and China, whose modernization programs proceed at rates and levels not seen since the Soviet period.

No NPT nuclear weapons state has shown any significant, practical interest in further reductions to notably lower numbers since the advent of the Obama administration’s nuclear approach of “leading the way” by setting a good example. China, France and the United Kingdom have made clear that they will not participate in multilateral reduction negotiations as long as U.S. and Russian arsenals remain so much larger than their own. For its part, Russia has placed one unacceptable condition after another on even beginning negotiations for a follow-on to the New START Treaty. Russia has also made abundantly clear that it has no interest in losing its huge advantage in non-strategic nuclear forces—an advantage that may result in significant part from the uneven fulfillment of the Presidential Nuclear Initiative (PNI).

There is also reason to suspect that the overall American disarmament agenda makes Russian and Chinese reductions harder. U.S. steps to reduce reliance upon nuclear weapons are predicated upon Washington’s unparalleled current conventional military power, its development of unique long-range precision, advanced conventional strike and global intelligence-gathering and targeting capabilities, as well as upon its possession of improving ballistic missile defense (BMD) capabilities.<sup>283</sup> Increasing U.S. exploitation of such non-nuclear forces, however, appears to make Moscow and Beijing (and probably other states) less interested in nuclear reductions. Russian officials in particular have stressed publicly that future negotiated nuclear reductions will not be possible without new constraints on U.S. conventional forces and ballistic missile defenses.<sup>284</sup>

Nor have weapons possessors outside the NPT shown the slightest interest in reductions in response to U.S. disarmament moves to date. Pakistan and India are presently building new weapons at a quick pace, the former increasing its “tactical” arsenal while the latter moves toward a full nuclear triad with the development of submarine-launched missile capabilities and reportedly also MIRV technology.<sup>285</sup> Meanwhile, North Korea is working to develop its own arsenal, testing intercontinental-range ballistic missile technology and nuclear devices, and vowing to restart plutonium production while it continues uranium enrichment. Pyongyang has abandoned even its former semblance of commitment to eventual denuclearization, and brandishes increasingly bellicose nuclear threats rather than demonstrating any interest in nuclear cuts.

### **Summary**

Further deep reductions as recommended by Minimum Deterrence would likely eliminate whatever leverage the U.S. might now retain to motivate Russian or Chinese nuclear reductions. And, contrary to the beliefs of Minimum Deterrence advocates, experience to date suggests that U.S. nuclear reductions are unlikely to inspire disarmament or non-proliferation rectitude in others. After two decades of dramatic post-Cold War U.S. nuclear reductions and four years of pro-disarmament U.S. nuclear policy, the case for the future diplomatic, arms control, and non-proliferation benefits of Minimum Deterrence remains exceedingly weak. So far, “minimalist” approaches have proven essentially fruitless in these regards. Of course, it is possible, in principle, that the future could unfold much differently than has the past, but to date there is little reason to expect the dramatic change presumed by Minimum Deterrence. To plan as if such change will occur, is to place hope over evidence.



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*“Nuclear weapons are used every day... to deter our potential foes and provide reassurance to the allies to whom we offer protection.”<sup>286</sup>*

*James Schlesinger*

**8. A small number of nuclear weapons is adequate for deterrence; thus U.S. defense spending can be reduced considerably by reducing nuclear forces.**

Minimum Deterrence proposals claim that effective deterrence can be maintained based on a small number of U.S. nuclear weapons rather than a large, diverse nuclear arsenal.<sup>287</sup> Consequently, most presentations of Minimum Deterrence make the corresponding claim of large potential cost savings in defense spending.<sup>288</sup> The *Global Zero* report states that, absent its recommended reductions, the United States will spend \$200 billion on needless nuclear modernization programs. In short, a theme of Minimum Deterrence proposals is the promise of substantially reduced defense spending.<sup>289</sup>

In addition, as noted, Minimum Deterrence presentations typically argue that any possible degradation in deterrence resulting from deep nuclear reductions can be mitigated with strengthened U.S. conventional forces and missile defense. Specifically, they often endorse the deployment of conventional prompt global strike (CPGS) and occasionally suggest additional *regional* missile defenses as capabilities with the potential to provide compensatory deterrent effect at low U.S. nuclear force levels. Yet, Minimum Deterrence presentations typically count only the possible savings from not developing and deploying U.S. nuclear forces; they do not take into account the costs associated with the recommended measures to strengthen deterrence via U.S. conventional capabilities. They identify the putative savings from deep nuclear reductions envisaged by Minimum Deterrence without also calculating the costs of these corresponding recommended measures, and therefore avoid providing any real “bottom line” regarding costs. Of course, a realistic portrayal of the true net costs associated with deep nuclear reductions must take into account the potential added costs for these programs.

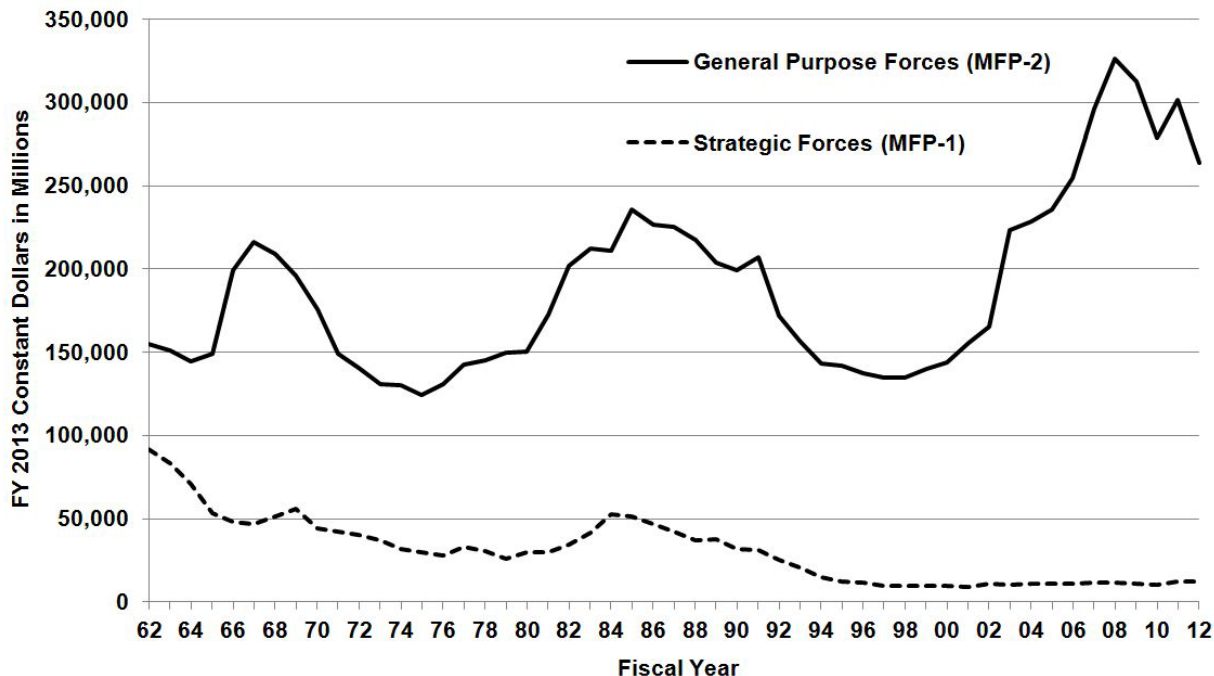
For example, to function in a nuclear context, conventional forces would have to be hardened against nuclear effects, and the related costs can be estimated.<sup>290</sup> Similarly, an alternative or supplement to GPS guidance would likely be necessary given its reported importance to the effectiveness of U.S. advanced conventional strike forces, and the pertinent U.S. satellites may be vulnerable to nuclear attack.<sup>291</sup> Finally, the ability of U.S. conventional weapons to threaten hard and deeply buried facilities has been assessed by the National Academy of Sciences, and appears to need substantially greater improvements.<sup>292</sup>

If such capabilities are deemed potentially important for U.S. deterrence strategies that are backed by far fewer and less diverse nuclear capabilities, then the prospective costs for such conventional capabilities must be considered for a realistic *net* cost estimate for the adoption of Minimum Deterrence. The issue then is not that less money would be spent on U.S. nuclear forces if the U.S. dramatically reduced its nuclear forces. That much may be true, but the pertinent question in this regard is whether there would plausibly be a net reduction or a net increase in U.S. defense spending as a result of Minimum Deterrence.

## Stubborn Facts

The first point to note in this regard is that nuclear forces represent a very small fraction of U.S. defense spending; the vast majority of U.S. defense dollars are spent in support of non-nuclear capabilities. Consequently, the fundamental truth is that the savings possible with regard to cuts in U.S. nuclear forces are limited even when looking at this factor alone. The graphic below, Figure 5, reflects this basic fact.

**Figure 5. Costs (TOA) of General Purpose and Strategic Forces**



Source: Office of the Under Secretary of Defense (Comptroller), *National Defense Budget Estimates for FY 2013* (Washington, D.C.: Department of Defense, March 2012), pp. 104-105.<sup>293</sup>

## A History Lesson

This graphic suggests an important fact with regard to the promise of savings: Nuclear weapons have played a major role in U.S. defense policy precisely because their overall cost is relatively low and their deterrence potential can be great. Former STRATCOM Commander Admiral Richard Mies has noted how “cost effective” nuclear weapons are—having consumed less than five percent of the Defense budget in exchange for high deterrence potential.<sup>294</sup> Tactical nuclear weapons were widely deployed within NATO because of their relatively low cost and the unwillingness of NATO nations to meet the ambitious conventional force goals identified at NATO’s 1952 meeting of the North Atlantic Council in Lisbon which, according to an official NATO history, “proved financially and politically impossible for the members of the Alliance.”<sup>295</sup> Similar obstacles impeded Secretary of Defense McNamara’s “flexible response” strategy of the 1960s, which put emphasis on conventional weapons.<sup>296</sup> The fundamental point here is that NATO and the United States chose to rely on nuclear forces for deterrence because they are relatively cheap and their deterrence benefit looms large.<sup>297</sup>

While there have been numerous helpful changes since the end of the Cold War, U.S. friends and allies bordering Russia continue to be much weaker in conventional capabilities than Russia, and Russia has massive nuclear capabilities. This is why our Central and Eastern European allies regard the continuation of the U.S. nuclear capability in Europe as critical for their security. This was reflected in the 2012 NATO *Deterrence and Defense Policy Review* and NATO's 2010 Lisbon Summit Declaration.<sup>298</sup>

### **Many Costs are Independent of the Number of Nuclear Weapons**

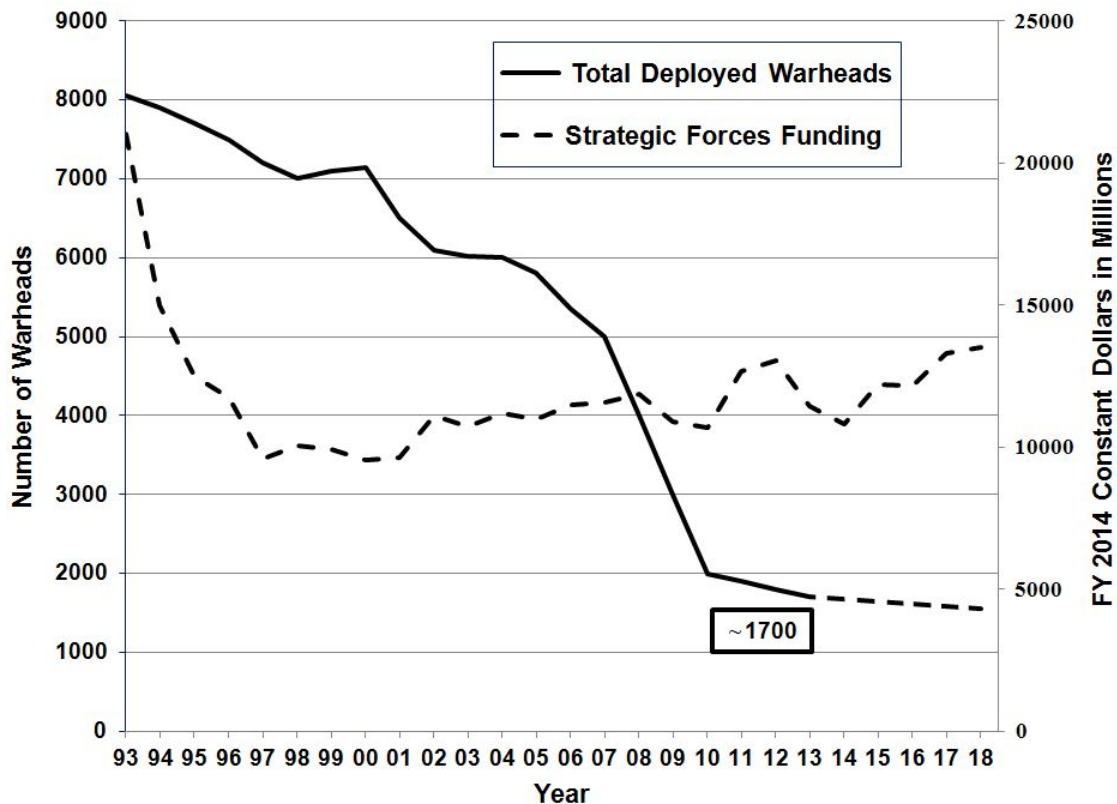
While buying fewer of anything may be less costly than buying more, many of the major cost elements of nuclear deterrence are unrelated to the number of nuclear weapons deployed. These include: 1) early warning systems; 2) survivable command and control; 3) nuclear infrastructure; and, 4) R&D for life extension, modernization and replacement of delivery systems.

A fact sheet published by the Federation of American Scientists and the Union of Concerned Scientists citing official sources concluded, "with a stockpile of some 500 warheads, the size and cost of the weapons complex would only be a little smaller than what is proposed for a stockpile of 3,000 to 3,500 weapons."<sup>299</sup> In February 2013, Don Cook, a top official at the National Nuclear Security Administration, the agency responsible for the nuclear weapons complex, observed that the desire of President Obama to reduce the number of nuclear weapons is "not principally . . . driven by cost,"<sup>300</sup> and, "not much savings will be achieved" by reducing the number of nuclear weapons given the "sizeable fixed costs." Britain's Defence Secretary, Philip Hammond, recently made the same point: "Even if you downgrade the capability significantly, the amount of money to be saved is pretty small" because Britain would need to maintain the necessary infrastructure.<sup>301</sup>

Indeed, infrastructure modernization (to improve safety, security and efficiency, and comply with environmental and other regulations) is one of the largest cost factors in maintaining a nuclear deterrent and is largely independent of the size of the total stockpile.<sup>302</sup> The Obama administration's proposed five-year nuclear infrastructure funding is over \$46 billion dollars.<sup>303</sup> In 2009, the bipartisan Congressional Commission on the Strategic Posture of the United States concluded that our nuclear "facilities are genuinely decrepit and are maintained in a safe and secure manner only at high cost."<sup>304</sup> The former Chairman of the House Armed Services Subcommittee on Strategic Forces, Congressman Michael Turner (R-OH), observed in 2012 that without infrastructure modernization, the United States will be "without the capability required to remain a nuclear weapons state."<sup>305</sup> These are costs that generally are unavoidable if the United States is to remain a nuclear power and are largely independent of reductions in the number of deployed U.S. weapons.

Figure 6 below shows that the reduction in the number of deployed warheads does not correspond to a comparable reduction in costs, precisely because many costs are relatively independent of the number of weapons.

Figure 6. Warhead Numbers and Strategic Forces Funding



Source: The nuclear warheads section of this graph is based on, Lt. Gen. James M. Kowalski, "To Deter and Assure," Air Force Global Strike Command, May 7, 2013, slide #2, available at <http://www.fas.org/programs/ssp/nukes/nuclearweapons/AFGSC-CommandBrief-May2013.pdf>. The spending section of this graph uses dollar amounts contained in, Office of the Under Secretary of Defense (Comptroller), *National Defense Budget Estimates for FY 2014*, Department of Defense, May 2013, pp. 112-113, available at [http://comptroller.defense.gov/defbudget/fy2014/FY14\\_Green\\_Book.pdf](http://comptroller.defense.gov/defbudget/fy2014/FY14_Green_Book.pdf).

### Cost of Conventional Deterrence

Most of the costs related to the U.S. nuclear deterrent are not the cost of the nuclear warheads produced but rather the cost of their delivery systems. Many Minimum Deterrence supporters urge the elimination of the triad. While this would indeed save money, the Minimum Deterrence claim of great cost reductions collapses given its corresponding claim that strengthened U.S. advanced conventional forces and theater missile defense would substitute to help preserve deterrence. Advanced conventional capabilities and missile defenses may add very usefully to the flexibility and resilience of U.S. deterrence forces, but if U.S. missile defense is intended to help mitigate deep nuclear force reductions for deterrence purposes, a much more robust system would likely be necessary—with corresponding added expense. The cost for a robust missile defense system for this purpose could add an estimated \$3-\$9 billion to the annual defense budget.<sup>306</sup>

Similarly, Minimum Deterrence proponents also identify conventional prompt global strike systems as an alternative to nuclear weapons for deterrence. The National Academy of Sciences in 2008 published a study of seven proposed CPGS systems and estimated the 20-year costs of each. The cost estimates for CPGS weapon development up to the point of initial operational capability ranged from \$1 billion to \$25 billion over 20 years; however the study notes, "Actual costs are more likely to be higher..."<sup>307</sup> The study also stated that if the United States were to create a CPGS system that could credibly threaten some Russian nuclear forces, it would likely require several hundred additional conventional ICBMs and their launchers at an added cost of several tens of billions of dollars.<sup>308</sup>

The cost of trying increasingly to deter with strengthened conventional weapons in place of nuclear must be included in any serious calculation of the costs and savings that would follow from Minimum Deterrence recommendations. Conventional weapons, even in large numbers, cannot duplicate the destructive effects of nuclear weapons.<sup>309</sup> As former STRATCOM Commander General Kevin Chilton observed, it is not possible to replace nuclear weapons by conventional weapons even at a ratio of ten to one.<sup>310</sup> Even for targets that can be threatened effectively with conventional weapons, far more weapons and associated delivery vehicles typically would be needed, which greatly increases costs. This would mean not only more munitions, but more delivery vehicles (e.g., missiles, ships, aircraft, etc.) and that would entail added costs.

Additionally, the 2010 New START Treaty creates cost problems for attempts to substitute conventional strategic forces for deterrence. Mixing nuclear and non-nuclear warheads on the same ICBM and SLBM is banned in New START.<sup>311</sup> Putting nuclear and conventional warheads on separate missiles is allowed but deployed missiles and their conventional warheads are numerically limited.<sup>312</sup> This means bombers and "new kinds" of conventional strategic offensive arms (e.g., hypersonic boost glide vehicles, new bombers<sup>313</sup> and supporting tankers, with survivable basing) would be needed, potentially in large numbers. These new kinds of delivery systems would need to be designed to avoid New START constraints. The cost of these systems would likely dwarf any prospective savings from the nuclear reductions of Minimum Deterrence.

Beyond numbers, a basic problem in attempting to substitute conventional weapons for deterrence is the fact that conventional forces reportedly are not hardened against nuclear effects.<sup>314</sup> As noted previously, the 2011 Defense Science Board (DSB) report concluded that the survivability of theater conventional forces against nuclear EMP "is at best unknown."<sup>315</sup> The Congressional Commission on EMP wrote that U.S. conventional weapons would have "inadequate" capability for even a regional war after a nuclear EMP attack and urged hardening of selective conventional weapons systems and "satellite navigation systems, satellite and airborne intelligence and targeting systems, an adequate communications infrastructure, and missile defense."<sup>316</sup>

Consequently, the cost of attempting to transfer deterrence requirements to conventional forces could include not just the cost of buying many more conventional munitions of existing types, but also the need for programs to modify existing weapons or create new weapons that work in a nuclear environment, and then to produce them in large numbers. The DSB also emphasized the "significantly increased cost of retrofit [hardening] after fielding."<sup>317</sup> Presumably because of this, the DSB report did not advocate nuclear hardening of existing conventional weapons.<sup>318</sup>



In contrast to this reality, little EMP hardening of conventional weapons reportedly is being accomplished.<sup>319</sup> According to the Chairman of the EMP Commission, Dr. William Graham, “the risk of an EMP attack may be greater today than during the Cold War, as several adversaries seek nuclear weapons, ballistic missiles, and asymmetric ways to overcome U.S. conventional superiority using one or a small number of nuclear weapons.”<sup>320</sup> Potential adversaries with EMP attack capabilities include both Russia and China.<sup>321</sup> Any serious plan to substitute conventional forces for deterrence purposes would have to include the cost of addressing such considerations.

### **Summary**

Despite the confident Minimum Deterrence claims of great savings, evidence appears to point in the direction of greater net costs under Minimum Deterrence. The potential savings from reducing the number of weapons are likely to be modest given the fact that many of the costs involved in the nuclear arsenal are determined largely by factors independent of the number of warheads. And, the costs involved in substituting advanced non-nuclear forces as replacements for nuclear forces for deterrence would likely overwhelm any savings from reductions in the latter. The U.S. and NATO went through this comparison of options in the past and reached the reasonably obvious conclusion: in the context of serious nuclear and conventional threats, reliance on nuclear deterrence is likely to be less costly than attempting to substitute conventional forces for deterrence. There is no apparent reason to conclude that the calculation of the various costs and savings associated with Minimum Deterrence recommendations would yield a significantly different conclusion today.

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## V. Summary and Conclusion: How Does Minimum Deterrence Fare Against Available Evidence and What Alternative Guidelines May Be Better?

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*“People can foresee the future only when it coincides with their own wishes, and the most grossly obvious facts can be ignored when they are unwelcome.”*

*George Orwell*

For the past five decades there have been periodic proposals within the U.S. for deep reductions in the U.S. nuclear arsenal. These proposals almost always promote an approach to deterrence and U.S. force sizing that has come to be known over the years as Minimum Deterrence.

The basic Minimum Deterrence argument is that nuclear weapons are so lethal that a small number is adequate for deterrence, and will be so in the future. Consequently, the fundamental Minimum Deterrence claim is that we can make deep nuclear reductions without jeopardizing deterrence or the assurance of allies.

The number of deployed nuclear weapons typically recommended in Minimum Deterrence proposals ranges from single digits to hundreds. The Global Nuclear Zero Commission’s report, for example, recommends 450 deployed weapons now, and fewer in the future.<sup>322</sup>

Minimum Deterrence proposals typically claim that deep reductions are a requirement of the 1968 Non-Proliferation Treaty, will reduce nuclear dangers, advance U.S. arms control and non-proliferation goals, and save billions of dollars—all without jeopardizing deterrence.

As noted in the Introduction, these Minimum Deterrence claims generally are predicated on the following series of eight interrelated propositions:

1. Deterrence will function reliably and predictably at low U.S. nuclear force numbers, now and in the future. U.S. conventional forces can substitute in many cases for nuclear forces to meet U.S. deterrence goals.
2. Russia and China are not U.S. adversaries; nuclear deterrence considerations no longer are pertinent to U.S. relations with these countries.
3. Nuclear weapons are irrelevant to today’s most pressing security threat—weapons of mass destruction terrorism.
4. Deterrence considerations alone determine the size and composition of the nuclear force requirements.
5. Ballistic missile submarines will remain invulnerable for 30 to 50 years. So, a small SSBN fleet can provide most or all of the nuclear capability needed for U.S. deterrence needs, now and in the future.

6. The number of nuclear weapons and the risk of accidents and crises are directly correlated (more nuclear weapons means increased risk, while a decrease in their number reduces the risk).
7. U.S. nuclear force reductions are essential to, and will strengthen, non-proliferation efforts; reductions also will facilitate further arms control progress. The NPT requires U.S. movement toward nuclear disarmament.
8. A small number of nuclear weapons is adequate for deterrence; thus U.S. defense spending can be reduced considerably by reducing nuclear forces.

It should be noted that in many instances Minimum Deterrence promises by their nature cannot be disproved—we often cannot “know” that something promised for the future will not happen. Nevertheless, with regard to the many Minimum Deterrence promises about international relations and leadership decision making, it can be demonstrated that what Minimum Deterrence proponents predict has not been possible in the past or is otherwise contrary to experience. The burden of proof is on those arguing that the future will be dramatically different from past experience: Change obviously takes place, but why should the future be so different in the ways promised by Minimum Deterrence? In most cases, Minimum Deterrence predictions are offered confidently without any plausible explanation or evidence.

Even the most comprehensive presentations of the Minimum Deterrence narrative offer little or no supporting evidence to buttress its main claims and predictions. This does not mean in every case that its predictions must be wrong; however, when the past and, in some cases, the present offer considerable contrary evidence, there is significant reason to be dubious.

With regard to promises about deterrence, British expert Sir Lawrence Freedman comments rightly that deterrence theory is a “gift to strategists in that its nature and workings remain so elusive and so imperfectly understood as to permit endless speculation with little danger of empirical refutation.”<sup>323</sup> The great flaw of Minimum Deterrence is not that it includes considerable speculation, but that its speculation and hopes are presented as enduring truths that should anchor U.S. nuclear policy.

When the core Minimum Deterrence propositions critical to the narrative are examined against available evidence, it is apparent that they are either demonstrably false, implausible or self-contradictory.

### **False or Implausible**

The Minimum Deterrence claim that deterrence, as a rule, is irrelevant to countering terrorism, for example, is a false generalization. We know that terrorists can be deterred in some circumstances, and, as discussed in Section Three of Part IV, there is no reason to dismiss the potential for U.S. nuclear capabilities to contribute by helping to deter their state sponsors from undertaking severely threatening forms of support for their terrorist clients.

As discussed in Section Eight, Minimum Deterrence also promises substantial savings via the reduction of U.S. nuclear weapons.<sup>324</sup> This claim, too, is demonstrably false. As Dr. Don Cook of the National Nuclear Security Administration said in recent testimony, “substantial savings” are not possible from reducing the number of nuclear warheads because many of the associated costs are independent of the number of warheads.<sup>325</sup> And, more importantly,

Minimum Deterrence recommendations that the United States substitute advanced conventional threats for nuclear would likely lead to a net increase in U.S. defense spending. For example, one advanced conventional strategic capability recommended in the *Global Zero* report alone might cost \$5-\$20 billion to reach initial operational capability,<sup>326</sup> and many additional conventional force improvements would be necessary. Rejecting modernization of the U.S. nuclear triad, and moving to a monad or a dyad would indeed reduce spending for those programs. But, any reasonable *net assessment* of the costs and savings from Minimum Deterrence recommendations will likely show a corresponding need to increase defense spending given the corresponding added burden on U.S. conventional forces, which historically have been relatively more expensive.

Minimum Deterrence claims to provide the proper measure of adequacy for the U.S. nuclear arsenal. This is an important claim because it allows Minimum Deterrence effectively to omit from consideration other national priorities that would suggest requirements beyond those necessary for deterrence. However, it is demonstrably wrong. As Section Four discusses, U.S. national priorities include the assurance of allies and limiting damage to the United States if deterrence fails. These goals are separate from deterrence and have requirements independent of those for deterrence that must be taken into account when calculating the size and character of the U.S. nuclear arsenal.

These three key Minimum Deterrence propositions are false. And, there is ample evidence that each of the following five core claims and predictions are questionable at best:

- Russia and China are and will remain essentially benign great powers vis-à-vis the United States and allies—thus nuclear deterrence is not pertinent to U.S. relations with Russia or China;
- deterrence will work reliably vis-à-vis state opponents, now and in the future, at very low U.S. nuclear force levels;
- conventional forces can substitute for nuclear forces for deterrence and assurance purposes;
- U.S. nuclear reductions will help to prevent proliferation, and help roll back existing proliferation problems such as North Korea and Iran; and,
- nuclear reductions will reduce the risks of conflict, accident and theft.

Each of these five claims is prominent in the contemporary Minimum Deterrence narrative. They are the basis for claiming that deep nuclear reductions hold the promise of great benefit and can be undertaken prudently because they pose little or no risk. Yet, these predictions are supported nowhere by demonstrable evidence, and in most cases are contrary to available experience.

For example, as discussed in Section Two of Part IV, it is impossible to predict credibly that U.S. relations with Russia and China, now and in the future, will be so benign that these countries no longer need to be part of U.S. nuclear deterrence considerations. That prediction is inconsistent with considerable current evidence that points to the contrary. For example, Alexi Arbatov, noted Russian defense expert and former deputy chairman of the Russian Duma's Defense Committee, reports that the beliefs underlying current Russian policy include the following: Russia is surrounded by enemies led by the United States; the United States and its allies may invade Russia anytime to seize its natural riches; nuclear weapons are the basis for Russian

security; and, correspondingly, U.S. calls for nuclear disarmament are a malicious U.S. trick.<sup>327</sup> Western observers may see such beliefs as paranoid nonsense but, according to Arbatov, within Russia they are not controversial.

Noted Russian journalist Pavel Felgenhauer, writes that Russian President Putin publicly denounces U.S. “arrogant imperialism,” and in return for improved relations demands that the United States:

- accept Russia’s veto over “any future U.S.-led military action;”
- accept Moscow’s reintegration and leadership “of the post-Soviet landmass;” and,
- treat any “dissidents inside Russia as terrorists.”<sup>328</sup>

Felgenhauer also reports that Putin sees U.S.-Russian relations as a “practically irreconcilable” zero-sum competition: “if we do not get them, then they will get to us.” He quotes Putin as observing that Russia cannot hope “to work in peace...this is the truth of life.”<sup>329</sup>

If these accounts are largely accurate, there clearly is considerable opportunity for serious friction in U.S.-Russian relations. Moreover, China currently is pressuring one of America’s closest allies, Japan, in an unprecedented fashion, reportedly going so far as to dispute Japan’s sovereignty over Okinawa.<sup>330</sup>

Regardless of how we would like to view Russia and China, their open-source discussions of threats and strategy point both to the United States as enemy number one and to the great relevance they attribute to their nuclear weapons.<sup>331</sup> Yet, the presumption of benign relations, now and in the future, is critical to the Minimum Deterrence argument that locking in deep nuclear reductions and other nuclear limitations can be done prudently. These promises are built on fragile expectations that seemingly ignore evidence.

In addition, as discussed in Part IV, Section One, it is impossible to claim credibly that deterrence will work reliably at low force levels, now or in the future.<sup>332</sup> Such unbounded promises cannot be considered plausible because human decision making, and thus deterrence, simply are not so predictable.

For the same reason, no one can claim credibly that U.S. conventional threats can substitute predictably for nuclear threats for deterrence. They have not deterred reliably in the past, and the increasing lethality of conventional forces against some types of targets may mean much or nothing for deterrence purposes, depending on how opponents view those forces—which, again, is not generally predictable with precision.

Likewise, the promises that U.S. nuclear reductions will strengthen non-proliferation, inspire Russia, China and other powers to follow the U.S. lead, and reduce incidents of accident and theft, are all contrary to considerable historical evidence. As Sections Six and Seven of Part IV demonstrate, the available historical evidence—including some recent events—does not support those promises.

In addition, the Minimum Deterrence narrative often wraps its claims about the need for reductions in a misreading of the NPT, seeking to link U.S. adherence to treaties with the recommendation of deep force reductions. Yet, the NPT contains no such obligation. In fact,

when Spurgeon Keeny of the NSC explained NPT provisions to Henry Kissinger in 1969, he stated that the reference to nuclear disarmament was “essentially hortatory.”<sup>333</sup>

Indeed, instead of helping, U.S. deep nuclear reductions would in some cases likely undermine U.S. non-proliferation goals. Available evidence demonstrates that some key allies already are wary of U.S. nuclear disarmament trends. Further movement in this direction could degrade the credibility of U.S. assurances to these allies and correspondingly increase allied interest in independent nuclear capabilities—thereby undermining U.S. non-proliferation goals.

Some key allied voices already are expressing such concerns openly. In South Korea, for example, two-thirds of the population now favor an independent South Korean nuclear capability.<sup>334</sup> Chung Mong Soon, the former head of South Korea’s ruling Saenuri Party, recently stated, “Possessing nuclear weapons is the best way to counter North Korea’s nuclear threats. It would send a strong political message not only to North Korea but also to China.”<sup>335</sup>

Similarly, a recent report by the Japanese Ministry of Defense’s policy research arm states that the credibility of the U.S. nuclear umbrella “must be underpinned” by “a strong counterforce capability” and “an effective strategic defense force.” This report adds that with, “Further progress in nuclear disarmament by the United States, if accompanied with a decrease in the role of the United States nuclear weapons, ...U.S. allies will inevitably feel less confident in the U.S. nuclear umbrella. Much less confident in the case of Japan.”<sup>336</sup> In short, further deep U.S. reductions could inspire a cascade of proliferation among friends and allies who otherwise would likely continue to rely on the U.S. nuclear umbrella.

In addition, as is demonstrated in Part IV, Section Six, available historical data also show no correlation between the number of nuclear weapons and accidents; the prospect for accidents appears to be determined by factors other than warhead numbers.

Finally, the prediction of SSBN invulnerability for half a century more may prove prescient; hopefully so. This is a key Minimum Deterrence claim because it is the basis for the recommendations to reduce the number of SSBNs and eliminate or reduce other legs of the triad. However, as Part IV, Section Five suggests, the many possibilities for rapid technological advancement and surprise should caution against basing U.S. policy on any such promises.<sup>337</sup> In the past, the U.S. has wisely sustained the three legs of the nuclear triad to guard against such challenges.

### **Key Minimum Deterrence Claims That Are Self-Contradictory**

As noted, much of the basic structure of the Minimum Deterrence argument and its recommendations has been around since the 1950s. Given this longevity, it is, perhaps, surprising that it contains multiple significant arguments and points that are internally contradictory.

For example, Minimum Deterrence recommends that the United States exploit its conventional force advantages to reduce its own reliance on nuclear weapons and thus inspire others to stand back from nuclear weapons and rally against nuclear proliferation. However, available open evidence demonstrates that some states, particularly including Russia, China and North Korea, place great emphasis on their nuclear weapons as the only means of defeating U.S.

conventional advantages.<sup>338</sup> Consequently, the substitution of strengthened advanced conventional capabilities for nuclear as recommended by Minimum Deterrence advocates is likely to lead these countries to emphasize nuclear forces even more, not follow the U.S. lead toward nuclear disarmament.

The most fundamental Minimum Deterrence proposition is that the requirements for nuclear deterrence can easily be met at very low force levels because key civil targets are small in number and exceedingly vulnerable to nuclear weapons. But, Minimum Deterrence proposals also claim that there is a great direct safety benefit in reducing the number of Russian nuclear weapons, hence the need to “lead by example.” But, if the lethality of very few nuclear weapons to civil targets ensures deterrence because very few nuclear weapons can cause “catastrophic” destruction, then it cannot also be true that reducing Russia’s deployed weapons from say 2,000 to 1,000, or even 500, will provide any great direct benefit for U.S. public safety in the event of an attack: by definition, even a few hundred remaining weapons would still cause wholly intolerable, “catastrophic” destruction. This is not to argue that there can be no possible value in agreed reductions. But, if the fundamental assumption about deterrence underlying Minimum Deterrence is correct, there can be no direct improvement in U.S. public safety from its proposed agreements for deep force reductions.

Similarly, it cannot be true both that nuclear weapons are now essentially irrelevant in our security relations with Russia and China, and that nuclear arms-reduction agreements with Russia and China would provide any great direct security benefit to the United States. The United States typically is unconcerned about the number of French or British nuclear weapons and engages in no such negotiations with them, presumably because they pose no threat to the United States. If U.S. relations with Russia and China are so amicable that nuclear deterrence truly no longer is pertinent, then there is no direct security value in focusing on negotiations to reduce incrementally the number of their nuclear weapons. Yet one of the great benefits of minimum deterrence is said to be that it would facilitate such negotiations.

Also, Minimum Deterrence claims that maintaining effective deterrence is a priority goal. Yet, deep nuclear reductions would degrade the U.S. force characteristics that may now be most important for deterrence, i.e., the flexibility and diversity necessary to adapt as needed to help deter a spectrum of severe threats in widely-differing scenarios. The bipartisan Strategic Posture Commission’s 2009 report emphasized the value of U.S. nuclear force flexibility and diversity to facilitate the U.S. ability to adapt deterrence as necessary. Consequently, it strongly endorsed preservation of the existing U.S. nuclear triad of bombers, ICBMs, and nuclear-missile submarines.<sup>339</sup> This flexibility and diversity is linked to the size and character of the U.S. nuclear arsenal, and further deep U.S. reductions now would threaten to degrade those critical qualities of the U.S. arsenal. Some Minimum Deterrence proponents now actually argue against U.S. force flexibility and diversity because these characteristics are inconsistent with their preferred deep reductions.<sup>340</sup>

As noted earlier, in 2010, Gen. Kevin Chilton, commander of Strategic Command, stated in testimony before the Senate that the 1,550 deployed warhead ceiling of the New START Treaty was the lowest level he could endorse given the need to preserve U.S. force flexibility and diversity.<sup>341</sup> Similarly, in 2012, Lt. Gen. James Kowalski, Commander of Air Force Global Strike Command, cautioned that any further reductions, “need to be bounded by the realpolitik of international relations.”<sup>342</sup> There has been no apparent great benign transformation of

international relations since to suggest that lower force levels would now be adequate for this purpose.

In addition, if deterrence is easily secured at very low force numbers as Minimum Deterrence advocates claim, then it must be true that the United States itself is vulnerable to deterrence by states with small survivable nuclear arsenals, prospectively including North Korea and Iran. If so, the advantages of possessing even a small nuclear force are likely to appear exceedingly attractive to such countries, and U.S. reduction of its nuclear arsenal hardly can be expected to have a beneficial non-proliferation effect on these states. Rather, validating Minimum Deterrence may spur them and others to seek nuclear capabilities all the more by lowering the apparent bar for securing a coercive nuclear capability against the United States.

Finally, the functioning of deterrence is not predictable and in some plausible cases it will fail. No plausible level of nuclear reductions would provide protection for U.S. civilian centers. Yet, Minimum Deterrence proponents also generally reject U.S. national missile defense capabilities to protect against nuclear attack. They claim that such capabilities will hamper movement toward deep reductions. Consequently, Minimum Deterrence policies effectively risk increasing the prospects for deterrence failure while simultaneously denying the United States defensive systems that might provide some protection in the event deterrence does fail. This would be the worst of all worlds. The emergence of new nuclear powers with modest arsenals and extreme hostility for the United States—including recent severe North Korean nuclear missile threats to the United States—suggests the great potential value and practicality of some U.S. strategic defensive capabilities.<sup>343</sup>

### **The Potential Degradation of Deterrence and Assurance at Very Low U.S. Force Numbers**

The problem with Minimum Deterrence is not only that it rests on false, implausible or self-contradictory claims. More important is the fact that its recommended deep force reductions, no “new” U.S. nuclear capabilities, and application of U.S. nuclear deterrence *only* to opponents’ nuclear threats (“sole purpose”) would likely undermine the U.S. capacity to deter opponents and assure allies. These policies would:

- offer fewer choices among warheads and delivery modes and restrict the U.S. capability to adapt to new threats in the future—thereby limiting U.S. flexibility and threat options that may be key to the effectiveness of U.S. deterrence strategies now and in the future;
- inevitably move U.S. deterrence strategies toward threats against civilian-based targets and/or threats against a small set of military targets: such threats may well be inadequate and/or incredible for some deterrence purposes, while purposefully targeting civilian centers violates long-standing moral norms;
- ease the technical/strategic challenges for opponents who might seek to counter our deterrence strategies and static nuclear capabilities, now or in the future;
- encourage rather than deter some opponents from arms competition and challenges to our deterrence strategies;
- threaten the U.S. capability to assure allies and thereby encourage some to acquire their own nuclear deterrents—and a possible “cascade” of nuclear proliferation;
- render U.S. deterrence forces more vulnerable to opponent covert deployments or cheating on arms control agreements in the absence of significant U.S. hedging measures and/or wholly unprecedented and intrusive verification measures; and,



- leave some severe threats by opponents free of any caution imposed by U.S. nuclear deterrence, including massive conventional, biological, chemical or cyber threats. This could increase the prospects for such attacks on the United States and allies. Some U.S. allies are concerned about the possibility of massive conventional threats and rely on the U.S. nuclear umbrella to help deter such threats. And, the 2013 Defense Science Board report on cyber threats concludes, “that a survivable nuclear triad...is required” to anchor U.S. deterrence capabilities against the cyber threat.<sup>344</sup>

### **Guidelines That Do Fit Available Evidence**

The same evidence that demonstrates Minimum Deterrence claims to be false, dubious or self-contradictory also suggests a better set of guidelines given contemporary realities. These nine guidelines below are fully in line with the conclusions of the bipartisan Congressional Strategic Posture Commission’s 2009 report.<sup>345</sup>

- The threat environment can change rapidly. U.S. calculations of force requirements must take into account that U.S. nuclear deterrence strategies need to be applicable to great nuclear powers, peers, regional opponents and state sponsors of terror who might otherwise enable terrorist organizations to acquire weapons of mass destruction.
- In such an environment, for deterrence to be as effective as possible, informed estimates of U.S. deterrence requirements must be based on an understanding of opponents’ diverse perceptions, values and likely modes of decision making in a wide variety of threat contexts. And, deterrence must be designed to apply to an extended time horizon, not just current conditions.
- Ample available evidence from historical cases demonstrates that nuclear weapons have contributed uniquely to the deterrence of both war and the escalation of conflict. Historical case studies and some anthropological studies suggest that the deterrent effect of nuclear weapons follows from the prevalent understanding that they threaten incalculable and uncontrollable consequences. This potentially unique deterrent effect of nuclear weapons should be taken into account in any determination of U.S. force requirements and reductions.
- In a highly-dynamic environment, deterrence requirements will be as varied and shifting as are opponents and contexts. A fixed approach will not fit all opponents and occasions. It is logical and reasonable in such an environment to expect that U.S. deterrence forces with flexibility and resilience can help U.S. deterrence strategies adapt to shifting requirements and be as effective as is possible. These key deterrence qualities are linked to the size and diversity of the U.S. arsenal and their preservation should be a high priority in the calculation of U.S. force adequacy. It is for this reason that the bipartisan Strategic Posture Commission emphasized the preservation of the U.S. nuclear triad; it offers considerable inherent flexibility, diversity and resilience.<sup>346</sup>
- Given the need for effective deterrence and the corresponding value of force flexibility, resilience and diversity, the United States should be most careful to avoid reductions and other restrictive measures that would lock in an undiversified and inflexible arsenal—whether done by treaty, executive agreement or unilaterally. Minimum

Deterrence proposals for very low force numbers, the elimination of the triad, and a standing policy of no “new” U.S. capabilities are particularly onerous in this regard.

- The integrity of U.S. alliances and the preservation of U.S. non-proliferation goals likely depend on the credible U.S. assurance of allies, including nuclear assurances. Given these priority goals, the United States must understand the unique security challenges and fears of allies, and size and structure U.S. forces with the unique requirements of their assurance in consideration. Deterrence and assurance are separate functions and their requirements will frequently differ. Here too, we should be most careful to avoid locking in an arsenal that is too narrow and inflexible to support both deterrence and the assurance of allies. U.S. advanced conventional forces and missile defenses may usefully complement U.S. nuclear forces for both purposes.
- Ample historical and contemporary evidence demonstrates that U.S. nuclear capabilities contribute uniquely to the assurance of at least some key allies. This assurance value of nuclear weapons is not subject to U.S. preference; it is a function of allied security concerns and felt needs. This assurance value of U.S. nuclear weapons should be taken into account in any calculation of U.S. nuclear force requirements and reductions. Minimum Deterrence proposals for deep force reductions, the elimination of the triad, the removal of nonstrategic nuclear weapons from Europe, and a standing policy of no “new” capabilities are particularly risky in this regard.
- The assertive Chinese posture in the South and East China seas, and the emerging and prospective nuclear threats from North Korea and Iran respectively are such serious security concerns to Japan and South Korea, and to U.S. friends and allies in the Middle East, that the United States must consider anew how it can strengthen deterrence and assure these allies, including via revitalized approaches to extended nuclear deterrence.
- The functioning of deterrence is not predictable and in some plausible cases, it will not work. This reality suggests the potentially great value of U.S. defensive capabilities, including missile defense, to provide protection for U.S. society in the event deterrence fails. This goal, too, should be a factor in U.S. force-sizing calculations vis-à-vis at least some plausible threats.

### **A Modern-Day Ten Year Rule**

Minimum Deterrence has similarities of the famous British Ten Year Rule. In August 1919, Britain, exhausted by World War I, established the Ten Year Rule. British armed forces were instructed to estimate their requirements and budget “on the assumption that the British Empire would not be engaged in any great war during the next ten years.”<sup>347</sup> This rule was to be in effect “on a daily moving basis” until such time as it was expressly removed.<sup>348</sup> Based on this hopeful prediction of a benign future and comparable high hopes for naval disarmament negotiations, British naval allocations were cut by 85 percent between 1919 and 1923.<sup>349</sup> This damaged Britain’s defense industry, making rearmament more difficult and expensive. The British government did not rescind the Ten Year Rule until 1932, and even then admonished that this did not mean the end of austere budgets. Of course, Britain began the struggle for its existence with a resurgent Germany seven years later and was ill-prepared for such a struggle,

in part as a result of this rolling Ten Year Rule that codified as a planning assumption the optimistic hope for a benign future and deferred prudent military preparation.

The Ten Year Rule was premised on a view of the international environment that fit the hopes and desires of an exhausted, war-weary Britain; those hopes, however, became increasingly surreal through the 1920s and early 1930s.

Today, in the United States, Minimum Deterrence is very much akin to the Ten Year Rule; its recommendations would lock in “legally binding” U.S. reductions and make recovery and adjustment very difficult, lengthy and costly in the event of a future that is darker than anticipated. And, it would do so at a time when Russia and China are modernizing their nuclear capabilities while explicitly threatening U.S. allies and naming the United States as the primary opponent, and while rogue states are moving forward on nuclear weapons and multiple means of delivery while also threatening the United States and allies.

Recall that the Minimum Deterrence narrative is based on many hopeful and essentially unbounded predictions, including:

- Russia and China are not pertinent threats and will not be in the future;
- nuclear weapons are not significant to the deterrence of priority threats facing the United States and will not be in the future;
- other states will “follow the U.S. lead” toward nuclear reductions and disarmament;
- deterrence will work at low force levels and with no new U.S. nuclear capabilities, now and in the future; and,
- U.S. allies will continue to be assured adequately as the U.S. reduces its nuclear forces dramatically.

Britain finally and fortunately abandoned the Ten Year Rule in 1932 after developments in Europe and Asia demonstrated that its premise did not reflect reality. Minimum Deterrence proponents have yet to reconsider their claims and predictions despite considerable contrary evidence.

During the period that the Ten Year Rule was in effect, Britain and the United States promoted various disarmament negotiations. The late celebrated U.S. diplomat and historian, George Kennan, offered the following indictment of these efforts:

A...line of utopian endeavor that preoccupied American statesmanship over long periods of time was the attempt to arrive at multilateral arrangements for disarmament...at the very time this mountainous labor was in progress, Weimar Germany was disintegrating miserably into the illness of National Socialism, and new political realities were being created which were to sweep all this labor from the scene...The evil of these utopian enthusiasms was not only, or even primarily, the wasted time, the misplaced emphasis, the encouragement of false hopes. The evil lay primarily in the fact that these enthusiasms distracted our gaze from the real things that were happening... The cultivation of these utopian schemes, flattering to our own image of ourselves, took place at the expense of our feeling for reality. And when the rude facts of the power conflict finally did intrude themselves directly upon us, in the form of enemies against whom we were forced to fight in the two World Wars, we found it difficult to perceive the relation

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between them and the historical logic of our epoch, because we understood the latter so poorly.<sup>350</sup>

The same can be said of the Minimum Deterrence approach to security today. Deterrence, extended deterrence and assurance are extremely important U.S. strategic goals, to be supported as effectively as possible in a dangerous and dynamic threat environment. The overarching guidelines for U.S. thinking and policy regarding these goals and the corresponding measures of adequacy for U.S. forces should reflect a vivid understanding of contemporary security realities and available evidence. Minimum Deterrence reflects neither.



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## Notes

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<sup>1</sup> General Kevin Chilton, Commander, U.S. Strategic Command, *Hearing of the Senate Foreign Relations Committee; Subject: The New START (Strategic Arms Control and National Security) Treaty: Views From the Pentagon*, Federal News Service, June 16, 2010, pp. 18-19.

<sup>2</sup> Quoted in Elaine Grossman, "U.S. Nuclear Commander Warns Against Rushing Further Arms Cuts," *National Journal*, September 14, 2012, available at <http://www.nti.org/gsn/article/us-nuclear-commander-warns-against-rushing-further-arms-cuts/>.

<sup>3</sup> William Perry and James Schlesinger, et al., *America's Strategic Posture: Congressional Commission on the Strategic Posture of the United States* (Washington, D.C.: United States Institute of Peace Press, 2009), pp. 20-21.

<sup>4</sup> Testimony before the House Appropriations Committee, Subcommittee on Energy and Water, February 14, 2013.

<sup>5</sup> As reported in Pavel Felgenhauer, "Russia Prepares for War with the US and NATO, While Lacking Resources," *Eurasia Daily Monitor*, Vol. 10, Issue 48 (March 14, 2013), available at [http://www.jamestown.org/single/?no\\_cache=1&tx\\_ttnews%5Btt\\_news%5D=40592](http://www.jamestown.org/single/?no_cache=1&tx_ttnews%5Btt_news%5D=40592).

<sup>6</sup> Pavel Felgenhauer, "The Uphill Job of Mending Fences with the Kremlin," *Eurasia Daily Monitor*, Vol. 10, No. 83 (May 2, 2013), available at [http://www.jamestown.org/single/?no\\_cache=1&tx\\_ttnews%5Btt\\_news%5D=40824&tx\\_ttnews%5BbackPid%5D=620](http://www.jamestown.org/single/?no_cache=1&tx_ttnews%5Btt_news%5D=40824&tx_ttnews%5BbackPid%5D=620).

<sup>7</sup> Pavel Felgenhauer, "Putin Believes US-Russian Relations Are Dominated by Zero Sum Game," *Eurasia Daily Monitor*, Vol. 10, No. 112 (June 13, 2013), available at [http://www.jamestown.org/single/?no\\_cache=1&tx\\_ttnews%5Btt\\_news%5D=41015](http://www.jamestown.org/single/?no_cache=1&tx_ttnews%5Btt_news%5D=41015).

<sup>8</sup> See for example the discussion in Andrew Futter and Benjamin Zala, "Advanced US Conventional Weapons and Nuclear Disarmament," *Nonproliferation Review*, Vol. 20, No. 1 (2012), pp. 111-113, 115-116.

<sup>9</sup> Perry and Schlesinger, et al., *America's Strategic Posture*, op. cit., pp. 25-26, 29.

<sup>10</sup> Brent Scowcroft and Arnold Kanter, "Which Nuke Policy?" *The Washington Times*, March 24, 1997, p. A15.

<sup>11</sup> Perry and Schlesinger, et al., *America's Strategic Posture*, loc. cit.

<sup>12</sup> Bruce Blair, et al., "One Hundred Nuclear Wars: Stable Deterrence Between the United States and Russia at Reduced Nuclear Force Levels," *Science & Global Security*, Vol. 19, No. 3 (2011), p. 186.

<sup>13</sup> The Minimum Deterrence approach to measuring U.S. nuclear force requirements also has been labeled Finite Deterrence. These titles tend to be used interchangeably, but the more common title, Minimum Deterrence, is used in this study.

<sup>14</sup> McGeorge Bundy, William J. Crowe Jr., and Sidney Drell, *Reducing Nuclear Danger* (New York: Council on Foreign Relations Press, 1993), p. 95.

<sup>15</sup> Kenneth N. Waltz, "More May Be Better," in Scott D. Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons* (New York: W.W. Norton & Company, 2000), p. 22.

<sup>16</sup> McGeorge Bundy, "To Cap the Volcano," *Foreign Affairs*, Vol. 48, No. 1 (October 1969), p. 10.

<sup>17</sup> Bundy, Crowe, and Drell, *Reducing Nuclear Danger*, op. cit.

<sup>18</sup> Kurt Guthe, *Ten Continuities in U.S. Nuclear Weapons Policy, Strategy, Plans, and Forces* (Fairfax, VA: National Institute for Public Policy, 2008), pp. 26-31.

<sup>19</sup> See, Alain C. Enthoven and K. Wayne Smith, *How Much Is Enough?* (New York: Harper & Row Publishers, 1971), p. 175.

<sup>20</sup> *Ibid.*, pp. 67, 207-208, 317-319.

<sup>21</sup> Draft Memorandum for the President, Secretary of Defense [Robert S. McNamara] to the President [Lyndon B. Johnson], Subj: Strategic Offensive and Defensive Forces, January 15, 1968, p. 9. (Originally classified; sanitized and declassified on January 5, 1983).

- <sup>22</sup> See for example, Richard Nixon, National Security Council, National Security Decision Memorandum-242, *Policy for Planning the Employment of Nuclear Weapons*, January 17, 1974, p. 2. (Top Secret; declassified February 20, 1998); and Presidential Directive/NSC-59, *Nuclear Weapons Employment Policy*, July 25, 1980 (Top Secret/Sensitive; declassified June 12, 2009). Available at the Jimmy Carter Presidential Library at, <http://www.jimmycarterlibrary.org/documents/pddirectives/pd59.pdf>.
- <sup>23</sup> Bruce Blair, et al., "Smaller and Safer," *Foreign Affairs*, Vol. 89, No. 5 (September-October 2010), p. 10.
- <sup>24</sup> Jeff Richardson, "Shifting From a Nuclear Triad to a Nuclear Dyad," *Bulletin of the Atomic Scientists*, Vol. 65, No. 5 (September/October 2009), p. 40.
- <sup>25</sup> Wolfgang Panofsky, "Nuclear Insecurity: Correcting Washington's Dangerous Posture," *Foreign Affairs*, Vol. 86, No. 5 (September/October 2007), p. 113.
- <sup>26</sup> Daryl G. Kimball, "Renewed U.S.-Led Nuclear Weapons Risk Reduction Steps Are Necessary and Overdue," *Arms Control Association*, Vol. 4, No. 5, June 14, 2013, available at <http://www.armscontrol.org/issuebriefs/Renewed-US-Led-Nuclear-Weapons-Risk-Reduction-Steps>.
- <sup>27</sup> Natural Resources Defense Council, "Pentagon Is Exaggerating China's Nuclear Capability to Justify Buying New Generation of U.S. Weapons, Report Finds," November 30, 2006, available at <http://www.nrdc.org/media/pressrelease/061130.asp>.
- <sup>28</sup> Hans Kristensen, Robert Norris, and Ivan Oelrich, *From Counterforce to Minimal Deterrence: A New Nuclear Policy on the Path Toward Eliminating Nuclear Weapons*, Occasional Paper No. 7 (Washington, D.C.: Federation of American Scientists and the Natural Resources Defense Council, April 2009), p. 2.
- <sup>29</sup> Sidney D. Drell and James E. Goodby, *What Are Nuclear Weapons For? Recommendations for Restructuring U.S. Strategic Nuclear Forces* (Washington, D.C.: Arms Control Association, October 2007), p. 15.
- <sup>30</sup> Bruce Blair, "Trapped in the Nuclear Math," *New York Times*, June 12, 2000, available at <http://www.nytimes.com/2000/06/12/opinion/trapped-in-the-nuclear-math.html>.
- <sup>31</sup> Steve Fetter, "Nuclear Strategy and Targeting Doctrine," in Harold A. Feiveson, ed., *The Nuclear Turning Point* (Washington, D.C.: Brookings Institution Press, 1999), p. 57.
- <sup>32</sup> Morton Halperin, et al., "Parsing the Nuclear Posture Review," *Arms Control Today*, Vol. 32, No. 2 (March 2002), pp. 19-20.
- <sup>33</sup> James Wood Forsyth Jr., B. Chance Saltzman, Gary Schaub Jr., "Minimum Deterrence and Its Critics," *Strategic Studies Quarterly*, Vol. 4, No. 4 (Winter 2010), p. 7.
- <sup>34</sup> Gareth Evans and Yoriko Kawaguchi, *Eliminating Nuclear Threats: A Practical Agenda for Global Policymakers*, Report of the International Commission on Nuclear Non-proliferation and Disarmament (Canberra: International Commission on Nuclear Non-proliferation and Disarmament, 2009), p. 194.
- <sup>35</sup> Stansfield Turner, "The Folly of the MX Missile," *New York Times Magazine*, March 13, 1983, pp. 94, 96.
- <sup>36</sup> White House, "Fact Sheet: Nuclear Weapons Employment Strategy of the United States," [WhiteHouse.gov](http://www.whitehouse.gov/the-press-office/2013/06/19/fact-sheet-nuclear-weapons-employment-strategy-united-states), June 19, 2013, available at <http://www.whitehouse.gov/the-press-office/2013/06/19/fact-sheet-nuclear-weapons-employment-strategy-united-states>.
- <sup>37</sup> James M. Acton, *Deterrence During Disarmament* (Abington, UK: Routledge, 2011), p. 99.
- <sup>38</sup> Robert Burns, "US Weighing Steep Nuclear Arms Cuts," *Associated Press*, February 14, 2012, [http://www.boston.com/news/nation/washington/articles/2012/02/14/ap\\_newsbreak\\_us\\_weighing\\_steep\\_nuclear\\_arm\\_s\\_cuts/](http://www.boston.com/news/nation/washington/articles/2012/02/14/ap_newsbreak_us_weighing_steep_nuclear_arm_s_cuts/); R. Jeffrey Smith, "Obama Administration Embraces Major New Nuclear Weapons Cut," *Center for Public Integrity*, February 8, 2013, available at <http://www.publicintegrity.org/2013/02/08/12156/obama-administration-embraces-major-new-nuclear-weapons-cut/>; and David E. Sanger, "Obama to Renew Drive for Cuts in Nuclear Arms," *New York Times*, February 11, 2013.
- <sup>39</sup> See for example, James Wood Forsyth Jr., B. Chance Saltzman, Gary Schaub Jr., "Remembrance of Things Past: The Enduring Value of Nuclear Weapons," *Strategic Studies Quarterly*, Spring 2010, pp. 74-89; and James Cartwright, et al., *Global Zero U.S. Nuclear Policy Commission Report: Modernizing U.S. Nuclear Strategy, Force Structure and Posture* (May 2012).
- <sup>40</sup> Most recently, for example: "... the President has determined that we can ensure the security of the United States and our allies and partners and maintain a strong and credible strategic deterrent while safely pursuing up to a one-third reduction in deployed strategic nuclear weapons from the level established in the New START Treaty." The

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"Today's most immediate and extreme danger remains nuclear terrorism." And, "Russia and the United States are no longer adversaries." Department of Defense, *Report on Nuclear Employment Strategy of the United States Specified in Section 491 of 10 U.S.C.*, Department of Defense, June 19, 2013, available at [http://www.defense.gov/pubs/ReporttoCongressonUSNuclearEmploymentStrategy\\_Section491.pdf](http://www.defense.gov/pubs/ReporttoCongressonUSNuclearEmploymentStrategy_Section491.pdf).

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"I firmly believe that we can ensure the security of the United States and our allies, maintain a strong deterrent against any threat, and still pursue further reductions in our nuclear arsenal." President Barack Obama, *Remarks by President Obama at Hankuk University*, The White House Office of the Press Secretary, March 26, 2012, available at <http://www.whitehouse.gov/the-press-office/2012/03/26/remarks-president-obama-hankuk-university>.

<sup>41</sup> As described by General Cartwright in his July 25, 2012 testimony before the Subcommittee on Energy and Water Development, Senate Committee on Appropriations, July 25, 2012, available at <http://www.appropriations.senate.gov/ht-energy.cfm?method=hearings.view&id=8434e3a5-d45f-4872-8c74-a4ec41dbf0fb>.

<sup>42</sup> Forsyth, et al., "Remembrance of Things Past," op. cit., pp. 76-77; and Forsyth, et al., "Minimum Deterrence and its Critics," pp. 5-6.

<sup>43</sup> Drell and Goodby, *What are Nuclear Weapons For?*, op. cit., p. 7.

<sup>44</sup> Kristensen, et al., *From Counterforce to Minimal Deterrence*, op. cit., pp. 1-2; Cartwright, et al., *Global Zero US Nuclear Policy Commission Report*, op. cit., p. 9.

<sup>45</sup> Kristensen, et al., *From Counterforce to Minimal Deterrence*, op. cit., p. 22.

<sup>46</sup> Acton, *Deterrence During Disarmament*, op. cit., pp. 58-69.

<sup>47</sup> Cartwright, et al., *Global Zero U.S. Nuclear Policy Commission Report*, op. cit., p. 2.

<sup>48</sup> Evans and Kawaguchi, *Eliminating Nuclear Threats*, op. cit., p. 66.

<sup>49</sup> Evans and Kawaguchi, *Eliminating Nuclear Threats*, op. cit., pp. 193-194; Acton, *Deterrence During Disarmament*, op. cit., p. 36.

<sup>50</sup> For a discussion of the latter type, see, Yehezkel Dror, "High-Intensity Aggressive Ideologies as an International Threat," *The Jerusalem Journal of International Relations*, Vol. 9, No. 1 (March 1987), p. 161. See also Yehezkel Dror, *Crazy States* (New York: Kraus Reprint, 1980), pp. 23-30.

<sup>51</sup> As stated by Kenneth Waltz, "More May Be Better," loc. cit.

<sup>52</sup> Robert Jervis, "The Political Effects of Nuclear Weapons: A Comment," *International Security*, Vol. 13, No. 2 (Fall 1988), p. 81.

<sup>53</sup> Hitler boasted with regard to himself and his party: "We have no scruples. I have no bourgeois hesitations. . . . Yes, we are barbarians! We want to be barbarians! It is an honorable title." Quoted in, Hermann Rauschning, *Hitler Speaks* (London: Thornton Butterworth, 1939), pp. 86-87. For a detailed discussion, see, Keith B. Payne, *Deterrence in the Second Nuclear Age* (Lexington, KY: University Press of Kentucky, 1996), pp. 39-77.

<sup>54</sup> Nicholas Wade, "Researchers Say Human Brain is Still Evolving," *New York Times Online*, September 8, 2005, available at [http://www.nytimes.com/2005/09/08/science/08cnd-brain.html?pagewanted=all&\\_r=0](http://www.nytimes.com/2005/09/08/science/08cnd-brain.html?pagewanted=all&_r=0).

<sup>55</sup> For a more complete discussion of deterrence and human cognition, see Thomas Scheber, "Evolutionary Psychology, Cognitive Function, and Deterrence," *Comparative Strategy, Special Issue: Understanding Deterrence*, Vol. 32, No. 2, November-December 2011, pp. 453-480.

<sup>56</sup> George Tenet (with Bill Harlow), *At the Center of the Storm: My Years at the CIA* (New York: Harper Collins, 2007), p. 46.



- <sup>57</sup> Kimberly Dozier, "Spy Chiefs defend Mideast work but miss Egypt call," *Associated Press*, February 11, 2011, available at <http://www.today.com/id/41529505/ns/4428757>.
- <sup>58</sup> Quoted in, Thom Shanker and David Sanger, "Missiles Put North Korea in a more Deadly Light," *International Herald Tribune*, January 19, 2013.
- <sup>59</sup> James R. Clapper, Senate Select Committee on Intelligence, Hearing, "Statement for the Record by Director of National Intelligence James R. Clapper – Worldwide Threat Assessment of the United States Intelligence Community," 112<sup>th</sup> Congress, 1<sup>st</sup> Session, February 16, 2011, p. 6, available at <http://www.intelligence.senate.gov/pdfs112th/112252.pdf>.
- <sup>60</sup> Quoted in, Micah Zenko, "100% Right 0% of the Time," October 16, 2012, at [http://www.foreignpolicy.com/articles/2012/10/16/why\\_the\\_military\\_cant\\_predict\\_the\\_next\\_war](http://www.foreignpolicy.com/articles/2012/10/16/why_the_military_cant_predict_the_next_war).
- <sup>61</sup> As Spurgeon Keeny, former Director of the Arms Control Association, stated regarding the universality of deterrence, "Even fanatical, paranoid regimes are deterred by the prospect of catastrophic consequences." "Inventing an Enemy," *New York Times*, June 18, 1994, p. 21.
- <sup>62</sup> See the discussion in David McCullough, *Truman* (New York: Simon and Schuster, 1992), p. 459.
- <sup>63</sup> Quoted in, Jung Chang and Jon Halliday, *Mao: The Unknown Story* (New York: Alfred Knopf, 2005), pp. 413-414.
- <sup>64</sup> Quoted in, Aleksander Fursenko and Timothy Naftali, *One Hell of a Gamble: Khrushchev, Castro and Kennedy, 1958-1964* (New York: W.W. Norton and Company, 1997), pp. 171, 241.
- <sup>65</sup> Viktor Semykin, interview for, "The Missiles of October: What the World Didn't Know," *ABC News*, Journal Graphics transcript no. ABC-40, October 17, 1992, p. 21.
- <sup>66</sup> Avner Cohen, *Israel and the Bomb* (New York: Columbia University Press, 1998), p. 342.
- <sup>67</sup> Oriana Fallaci, "Galtieri: No Regrets, No Going Back," *Times* (London), June 12, 1982, p. 4.
- <sup>68</sup> Numerous historical occasions when leaderships did not behave as they "should" are presented in, Keith B. Payne, *The Fallacies of Cold War Deterrence and a New Direction* (Lexington, KY: University Press of Kentucky, 2001), Chapters 1 and 3. See also Barry Wolf, *When the Weak Attack the Strong: Failures of Deterrence*, A RAND Note, N-3261-A (Santa Monica, CA: RAND Corporation, 1991), pp. 1-18.
- <sup>69</sup> Victor Gobarev, "Soviet Military Plans and Actions During the First Berlin Crisis, 1948-49," *Journal of Slavic Military Studies*, Vol. 10, No. 3 (September 1997), p. 5.
- <sup>70</sup> Marc Trachtenberg, *History & Strategy* (Princeton, NJ: Princeton University Press, 1991), p. 258.
- <sup>71</sup> Quoted in, "Pak's N-bomb prevented Indian retaliation after 26/11," *The Indian Express*, March 9, 2009, available at <http://www.indianexpress.com/news/paks-nbomb-prevented-indian-retaliation-after-2611/432730/0>.
- <sup>72</sup> Charles A. Duelfer, testimony, Senate Armed Services Committee, Subcommittee on Emerging Threats and Capabilities: *The Weapons of Mass Destruction Program of Iraq*, Senate Hearing 107-573, 107<sup>th</sup> Cong., 2<sup>nd</sup> Sess. (Washington, D.C.: GPO, 2002), pp. 92-93, at [http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=107\\_senate\\_hearings&docid=f:80791.pdf](http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=107_senate_hearings&docid=f:80791.pdf). See also the work by Kevin Woods, task leader of the Iraqi Perspectives Project at the Institute for Defense Analyses, and David Palkki, deputy director of National Defense University's Conflict Records Research Center. They presented their respective views on this subject as described at a Policy Forum Luncheon by the Washington Institute for Near East Policy, "Knowing the Enemy: Iraqi Decisionmaking Under Saddam Hussein," September 20, 2010. This forum can be found at <http://www.c-spanarchives.org/program/id/233237>.
- <sup>73</sup> Alexander George and Richard Smoke, *Deterrence in American Foreign Policy* (New York: Columbia University Press, 1974), p. 529.
- <sup>74</sup> Jared Diamond, *The World Until Yesterday: What Can We Learn from Traditional Societies?* (New York: the Penguin Group, 2012), pp. 139-141.
- <sup>75</sup> Kenneth Watman and Dean Wilkening, *U.S. Regional Deterrence Strategies* (Santa Monica, CA: RAND Corp., 1995), pp. 8-9.
- <sup>76</sup> Quoted in, Elaine M. Grossman, "Debate Heats Up Over Conventional, Nuclear Deterrence Tradeoffs," *Global Security Newswire*, March 19, 2010, available at <http://www.nti.org/gsn/article/debate-heats-up-over-conventional-nuclear-deterrence-tradeoffs/>.

<sup>77</sup> See statement by Harold Brown in US Senate, Committee on Armed Services, *MX Missile Basing Systems and Related Issues*, Hearings, 98<sup>th</sup> Congress, 1<sup>st</sup> Session (Washington, D.C.: GPO, 1983), pp. 6-7.; R. James Woolsey, "US Strategic Force Decisions for the 1990s," *Washington Quarterly*, Vol. 12, No. 1 (Winter 1989), p. 82. As Henry Kissinger and Brent Scowcroft have observed in this regard, "In assessing the level of unacceptable damage, the United States cannot assume that a potential enemy will adhere to values or calculations identical to our own. We need a sufficient number of weapons to pose a threat to what potential aggressors value under every conceivable circumstance. We should avoid strategic analysis by mirror-imaging." Henry Kissinger and Brent Scowcroft, "Nuclear Weapon Reductions Must be Part of Strategic Analysis," *Washington Post*, April 22, 2012, at, [http://articles.washingtonpost.com/2012-04-22/options/35454468\\_1\\_nuclear-weapons-strategic-forces-low-numbers](http://articles.washingtonpost.com/2012-04-22/options/35454468_1_nuclear-weapons-strategic-forces-low-numbers).

<sup>78</sup> Richard Danzig, Secretary of the Navy under President Clinton, has observed rightly in this regard, "The acceleration, proliferation and diversification of technical and political changes make the 21<sup>st</sup>-century security risks even more unpredictable than those of the past...The number and diversity of variables that influence the national security environment confound multi-decade forecasting...Each of these alone would be imponderable. Getting them all right at once is wildly improbable. Worse still, the evolution of these variables is complex and nonlinear." Richard Danzig, *Driving in the Dark: Ten Propositions about Prediction and National Security*, Center for a New American Security, October 2011, pp. 5, 15. See the discussion of the extreme fluidity of the contemporary international environment in, National Intelligence Council, *Mapping the Global Future: Report of the National Intelligence Council's 2020 Project* (Undated, unclassified briefing), pp. 4, 18-19. See also the discussion of rapid changes in threat conditions in, William Odom, et al., *The Emerging Ballistic Missile Threat to the United States*, Report of the Proliferation Study Team (Fairfax, VA: National Institute for Public Policy, February 1993), pp. 19-21.

<sup>79</sup> Quoted in, Jack Moore, "Clapper: Sequestration 'quite damaging' to national intelligence," February 15, 2013 at [http://federalnewsradio.com/1104/3226282/clapper\\_sequestration\\_quite\\_damaging\\_to\\_national\\_intelligence](http://federalnewsradio.com/1104/3226282/clapper_sequestration_quite_damaging_to_national_intelligence).

<sup>80</sup> For deterrence purposes, *flexibility* is the capacity to threaten a spectrum of target types, with varying scope, scale and intensity, depending on the opponent, circumstances and deterrence goals. As Kurt Guthe rightly notes, "holding at risk certain kinds of targets might deter an adversary with one set of values, but not another with a different set." See, Guthe, "Deterrence, the Triad, and Dyads," in Barry Schneider and Patrick Ellis, eds., *Tailored Deterrence: Influencing States and Groups of Concern* (Maxwell Air Force Base, AL: USAF Counterproliferation Center, May 2011), p. 333. *Resilience* is the capacity to "recover from or adjust to unfavorable strategic developments, technical difficulties, operational challenges, or technological surprises." Adverse strategic developments could include the emergence of new or intensification of strategic threats to the United States and allies, the sharp deterioration of US political relations with existing opponents, the emergence of new opponents, or a disruption in traditional alliance relations. Technical problems could include discovery of a defect in a warhead type and/or significant deficiencies in delivery vehicles (e.g., their survivability and effectiveness). See, Keith Payne, et al., *Planning the Future U.S. Nuclear Force*, Vol. II (Fairfax, VA: National Institute for Public Policy, October 2009), p. xviii.

<sup>81</sup> See Keith B. Payne, *The Great American Gamble: Deterrence Theory and Practice from the Cold War to the Twenty-First Century* (Fairfax, VA: National Institute Press, 2008), Chapters 4 and 5.

<sup>82</sup> See for example, "A Conversation with General C. Robert Kehler," U.S. Air Force, Commander, U.S. Strategic Command (STRATCOM), Council on Foreign Relations, Washington, D.C., May 30, 2012, available at <http://www.cfr.org/united-states/conversation-general-c-robert-kehrler/p2804>; Chilton, *The New START*, loc. cit.; Adm. Richard Mies, USN (ret.), "Strategic Deterrence in the 21<sup>st</sup> Century," *Undersea Warfare* (Spring 2012), pp. 12-19; and, General James Cartwright, US Senate, *Committee on Armed Services, Hearing to Consider the Nominations of General James E. Cartwright, USMC, For reappointment to the Grade of General and Reappointment as the Vice Chairman of the Joint Chiefs of Staff*, July 9, 2009, p. 8, available at <http://www.armed-services.senate.gov/Transcripts/2009/07%20July/09-58%20-%207-9-09.pdf>.

<sup>83</sup> Perry and Schlesinger, et al., *America's Strategic Posture*, op. cit., pp. 23-26.

<sup>84</sup> Michael Donley, the Obama administration's Secretary of the Air Force has rightly observed in this regard: "In the context of rising nuclear capabilities elsewhere in the world, it's even more important that we have the flexibility across land and air-based and sea-based legs of the triad. We have flexibility of basing those, in targeting methods and other aspects of this mission that give us confidence that we can continue to deter..." Quoted in, "B-61 Bomb Project to Cost \$10 billion: DOD," *Global Security Newswire*, July 26, 2012, available at <http://www.nti.org/gsn/article/b-b1-bomb-project-cost-10-billion-dod/>.

<sup>85</sup> Department of Defense, *Quadrennial Defense Review Report*, February 2010, p. 18.

<sup>86</sup> Mies, "Strategic Deterrence in the 21<sup>st</sup> Century," op. cit., p. 19.

<sup>87</sup> Perry and Schlesinger, et al., *America's Strategic Posture*, op. cit., pp. 25-26, 29.

<sup>88</sup> As is discussed in a careful study of historical cases. Matthew Kroenig, “Nuclear Superiority and the Balance of Resolve: Explaining Nuclear Crisis Outcomes,” *International Organization*, Vol. 67, No. 1 (January 2013), pp. 141-171.

<sup>89</sup> Japanese Ministry of Defense, *National Defense Program Guidelines for FY 2011 and Beyond*, December 17, 2010, p. 2, available at [http://www.mod.go.jp/e/d\\_act/d\\_policy/pdf/guidelinesFY2011.pdf](http://www.mod.go.jp/e/d_act/d_policy/pdf/guidelinesFY2011.pdf).

<sup>90</sup> Koji Tomita, Embassy of Japan to the United States, 2013 Carnegie International Nuclear Policy Conference: Extended Deterrence, Carnegie Endowment for International Peace, Washington, D.C., April 19, 2013, Federal News Service Transcript.

<sup>91</sup> Présidence De La République, *The French White Paper on Defence and National Security*, June 2008, p. 7, available at [http://www.cfr.org/France/French\\_white\\_paper\\_defense\\_national\\_security/p16615](http://www.cfr.org/France/French_white_paper_defense_national_security/p16615).

<sup>92</sup> Department of Defense, *Sustaining U.S. Leadership: Priorities For 21<sup>st</sup> Century Defense*, January 2012, p. 5, available at [http://www.defense.gov/news/Defense\\_Strategic\\_guidance.pdf](http://www.defense.gov/news/Defense_Strategic_guidance.pdf).

<sup>93</sup> Glenn Snyder, *Deterrence and Defense: Toward a Theory of National Security* (Princeton, NJ: Princeton University Press, 1961), p. 57.

<sup>94</sup> See for example, Joint Chiefs of Staff, *Legal Support to Military Operations*, Joint Publications 1-04, August 17, 2011, p. II-2.

<sup>95</sup> Federation of American Scientists, Natural Resources Defense Council, and Union of Concerned Scientists, “Toward True Security,” *Union of Concerned Scientists* (Cambridge, MA: February 2008), pp. 17-18. Available at <http://www.ucsusa.org/assets/documents/nwgs/toward-true-security.pdf>.

<sup>96</sup> A study by the Natural Resources Defense Council showed that a small “countervalue” strike with up to 192 weapons would inflict 54-56 million casualties in an exchange with Russia, while a very large “counterforce” strike employing many times that number of weapons (approximately 1,300) would inflict 11-17 million casualties. See Matthew McKinzie, et al., *The U.S. Nuclear War Plan: A Time for a Change* (New York: National Resources Defense Council, June 2001), pp. x, 125. Other studies find far fewer casualty levels from “counterforce” targeting scenarios and much higher possible casualty levels from intentional “countervalue” targeting. The distinction here involves literally scores of millions of potential casualties. See for example, United States Senate, Subcommittee on Arms Control, International Law and Organization of the Committee on Foreign Relations, Hearing, *Briefing on Counterforce Attacks*, 93<sup>rd</sup> Congress, 2<sup>nd</sup> Session, September 11, 1974, pp. 12-22; Keir Lieber and Daryl Press, “The Nukes We Need: Preserving the American Deterrent,” *Foreign Affairs*, Vol. 88, No. 6 (November/December 2009), p. 47; and, U.S. Congress, Office of Technology Assessment, *The Effects of Nuclear War* (Washington, D.C.: USGPO, May, 1979), p. 10.

<sup>97</sup> Department of Defense, “Special Briefing on New Nuclear Posture Review from the Pentagon,” Transcript, April 6, 2010, available at <http://www.defense.gov/transcripts/transcript.aspx?transcriptid=4600>. For a similar claim see, Ellen Tauscher, “The Second Annual Nuclear Deterrence Summit,” February 17, 2010, Alexandria, VA, available at <http://www.state.gov/t/us/136799.htm>.

<sup>98</sup> See for example, the remarks by Acting Under Secretary of State for Arms Control and International Security, Rose Gottemoeller, “Arms Control in the Information Age: The ‘Getting to Zero’ Toolbox,” Global Zero Conference at Yale University, New Haven, CT, February 18, 2012, available at <http://www.state.gov.t.us.184321.htm>.

<sup>99</sup> This important point—rarely discussed—was suggested in a recent report of the Government Accountability Office: “Some [nuclear weapon] limitations require mitigation actions, which can impose logistical burdens, increased security risks, and war planning restriction on the Air Force, Navy and STRATCOM. DOD officials said they would have less flexibility in mitigating the limitations in the future should the stockpile’s size be reduced as future arms control agreements are pursued.” US Government Accountability Office, *Nuclear Weapons: NNSA Needs to Improve Guidance on Weapon Limitations and Planning for Its Stockpile Surveillance Program*, GAO-12-88, February 2012, available at <http://www.gao/assets/590/588307.pdf>.

<sup>100</sup> “The analysis of the effect of deep reduction on international security is built on three main assumptions. Firstly, it is assumed that international relations (both between Russia and the U.S. and with their potential adversaries) will not get significantly better or worse than they are today.” Acton, *Deterrence During Disarmament*, op. cit., p. 22.

<sup>101</sup> See the discussion by the former Commander of Strategic Command, Adm. Richard Mies, USN (ret.), “Strategic Deterrence in the 21<sup>st</sup> Century,” op. cit., pp. 14-16.

<sup>102</sup> Kissinger and Scowcroft, “Nuclear Weapon Reductions Must be Part of Strategic Analysis,” loc. cit.

<sup>103</sup> Donald H. Rumsfeld, *Annual Report to the President and the Congress* (Washington, D.C.: GPO, 2002), pp. 88-89, available at [http://history.defense.gov/resources/2002\\_DoD\\_AR.pdf](http://history.defense.gov/resources/2002_DoD_AR.pdf).

<sup>104</sup> Chilton, *The New START*, loc. cit.

<sup>105</sup> See the prescient discussion by Walter B. Slocombe in, "The Future of U.S. Nuclear Weapons in a Restructured World," in *Nuclear Weapons in the Changing World*, Patrick Garrity and Steven Maaranen, eds. (New York: Plenum Press, 1992), pp. 58-59.

<sup>106</sup> *Ibid.*, pp. 54-55.

<sup>107</sup> Scowcroft and Kanter, "Which Nuke Policy?," loc. cit.

<sup>108</sup> Cartwright, et al., *Global Zero U.S. Nuclear Policy Commission Report*, op. cit., p. 11.

<sup>109</sup> For example, "As our conventional weapons have become more precise, we do not have to cling to nuclear weapons to accomplish our objectives." Tauscher, "The Second Annual Nuclear Deterrence Summit," loc. cit. And, "Deterrence depends on the credibility of response. A massive and potential conventional response to non-nuclear aggression is highly credible." Under Secretary of State Ellen Tauscher, quoted in, Amy Woolf, *Nonstrategic Nuclear Weapons*, CRS Report for Congress, Congressional Research Service, 7-5700, RL32572, February 14, 2012, pp. 24-25, available at <http://www.fas.org/sgp/crs/nuke/RL32572.pdf>. See also, Cartwright, et al., *Global Zero U.S. Nuclear Policy Commission Report*, op. cit., p. 13.

<sup>110</sup> *Report of the Defense Science Board Task Force on Future Strategic Strike Forces* (Washington, D.C.: Office of the Undersecretary of Defense for Acquisition, Technology and Logistics, February 2004), p. 6-3, available at <http://www.acq.osd.mil.dsb/reports/ADA421606.pdf>.

<sup>111</sup> This list is derived from specific comments from Adm. Richard Mies.

<sup>112</sup> See, Elaine M. Grossman, "A Former Nuclear Commander Not Wild About Nukes," *Global Security Newswire*, May 28, 2008, available at <http://www.nti.org/gsn/article/a-former-nuclear-commander-not-wild-about-nukes/>.

<sup>113</sup> Mies, "Strategic Deterrence in the 21st Century," op. cit., p. 16.

<sup>114</sup> According to former Russian Atomic Energy Minister Viktor Mikheylov, spin isomers could produce 1/10,000 the power of nuclear fission. Fusion in turn produces pound for pound about 15 times the energy of nuclear fission. The feasibility of isomer weapons is unknown. See "Russia: Putin Claims on New Nuclear Weapons Dismissed As 'Political Bluff'," *Moscow Nezavisimaya Gazeta*, November 19, 2004, available at <http://www.wnc.dialog.com/>.

<sup>115</sup> The Committee on the Effects of Nuclear Earth-Penetrator and Other Weapons, National Research Council Division on Engineering and Physical Sciences, *Executive Summary Effects of Nuclear Earth Penetrator and Other Weapons* (Washington, D.C.: National Academy of Sciences, 2005), pp. S-2-3, available at [http://books.nap.edu/catalog.php?record\\_id=11282](http://books.nap.edu/catalog.php?record_id=11282).

<sup>116</sup> "ROK Daily: China Builds Underground 'Great Wall' Against Nuke Attack," *Chosun Ilbo Online*, December 14, 2009, available at <http://www.wnc.dialog.com/>; Zhang Jun and Xia Hongqing, "Second Artillery Engineering Design Research Institute Engineers Use Blood and Sweat to Design Underground 'Great Wall' Sites One After the Other," *Jiefangjun Bao (Internet Version)*, November 21, 2006, available at <http://www.wnc.dialog.com/>; and, Bret Stephens, "How Many Nukes Does China Have? Plumbing the secret Underground Great Wall," *Wall Street Journal*, October 24, 2011, available at <http://online.wsj.com/article/SB10001424052970204346104576639502894496030.html>.

<sup>117</sup> US Government Accountability Office, *Operation Desert Storm: Evaluation of the Air Campaign*, GAO/NSIAD-97-134 (Washington, D.C.: GAO, June 1997), p. 198; Paul Richter, "'Bunker-Busters' Aim at Heart of Leadership," *Los Angeles Times*, May 5, 2009, available at <http://articles.latimes.com/1999/may/05/news/mn-34178>; and, Keith B. Payne, "On Nuclear Deterrence and Assurance," *Strategic Studies Quarterly*, Vol. 3, No. 1 (Spring 2009), p. 51, available at <http://www.au.af.mil/au/ssq/2009/Spring/payne.pdf>.

<sup>118</sup> Tim Ripley, "Kosovo: A Bomb Damage Assessment," *Jane's Intelligence Review*, Vol. 11, No. 9 (September 1999), p. 11.

<sup>119</sup> *Ibid.*

<sup>120</sup> "US worries over China's underground nuclear network," *AFP*, October 14, 2011, available at [http://www.google.com/hostednews/afp/article/ALeqM5iHO\\_kCCLQm86s29jw45F1x6EkdLQ](http://www.google.com/hostednews/afp/article/ALeqM5iHO_kCCLQm86s29jw45F1x6EkdLQ). According to STRATCOM Commander General Robert Kehler, Chinese underground "tunnels are a problem for us." See "Rep. Turner's Remarks," Asian Arms Control Project, Georgetown University, June 29, 2012, available at <http://www.asianarmscontrol.org/content/rep-turners-remarks>.

<sup>121</sup> Woolsey, "US Strategic Force Decisions for the 1990s," loc. cit.

<sup>122</sup> Andrew F. Krepinevich, *US Nuclear Forces: Meeting the Challenges of a Proliferated World*, (Washington, D.C.: Center for Strategic and Budgetary Assessments, 2009), p. 28, available at [www.csbaonline.org/wp-content/.../2009.10.02-US-Nuclear-Forces.pdf](http://www.csbaonline.org/wp-content/.../2009.10.02-US-Nuclear-Forces.pdf).

<sup>123</sup> *Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack*, Volume 1, 2004, p. 48, available at [http://www.empcommission.org/docsR/empc\\_exec\\_rpt.pdf](http://www.empcommission.org/docsR/empc_exec_rpt.pdf); Dr. William R. Graham, Chairman, Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack, "Statement Before the House Armed Services Committee, July 10, 2008," p. 2, available at <http://www.empcommission.org/docs/GRAHAMtestimony10JULY2008.pdf>; *Interim Report of the Defense Science Board (DSB) Task Force on the Survivability of Systems and Assets to Electromagnetic Pulse (EMP) and other Nuclear Weapon Effects (NWE)*, (Washington, D.C.: Defense Science Board, August 2011), available at <http://www.acq.osd.mil/dsb/reports/ADA550250.pdf>.

<sup>124</sup> James Jay Carafano, Baker Spring and Richard Weitz, *Before the Lights Go Out: A Survey of EMP Preparedness Reveals Significant Shortfalls*, Heritage Foundation, August 15, 2011, available at <http://www.heritage.org/research/reports/2011/08/before-the-lights-go-out-a-survey-of-emp-preparedness-reveals-significant-shortfalls>; *Interim Report of the Defense Science Board (DSB) Task Force on the Survivability of Systems and Assets to Electromagnetic Pulse (EMP) and other Nuclear Weapon Effects (NWE)*, op. cit.

<sup>125</sup> Mark Schneider, "Zero Deterrent?," *Air Force Magazine*, Vol. 95, No. 8, August 2012, p. 52, available at <http://www.airforcemag.com/MagazineArchive/Pages/2012/August%202012/0812Zero.aspx>; Shaun Waterman, "North Korean jamming of GPS shows system's weakness," *Washington Times*, August 23, 2012, available at <http://www.washingtontimes.com/news/2012/aug/23/north-korean-jamming-gps-shows-systems-weakness/?page=all>; Dieter Bohn, "Researchers say GPS jamming is on the rise, raise concern that GPS spoofing may be next," February 22, 2012, available at <http://www.heverge.com/2012/2/22/2815744/gps-jamming-spoofing-uk-study-conference>; and, Carlo Kopp, "GPS Aided Guided Munitions - Parts I-V," *Air Power Australia*, August 2008, available at <http://www.ausairpower.net/TE-GPS-Guided-Weps.html>.

<sup>126</sup> Lieutenant General James M. Kowalski, Commander, AF Global Strike Command, as quoted in "Remarks to the Defense Writers Group," February 6, 2013, transcript, pp. 3-4, available at <http://www.afgsc.af.mil/shared/media/document/AFD-130208-030.pdf>.

<sup>127</sup> Key US allies certainly appear to see the role of nuclear and advanced conventional capabilities for deterrence and assurance. See for example, North Atlantic Treaty Organization, "Deterrence and Defense Posture Review Press Release 063," May 20, 2012, available at [http://www.nato.int/cps/en/natolive/official\\_texts\\_87597.htm?mode=pressrelease](http://www.nato.int/cps/en/natolive/official_texts_87597.htm?mode=pressrelease). See also, Kurt Guthe and Thomas Scheber, *Assuring South Korea and Japan as the Role and Number of U.S. Nuclear Weapons are Reduced*, Defense Threat Reduction Agency, Advanced Systems and Concepts Office, Report No. ASCO 2011 033, January 2011, pp. 30-33 available at <http://nipp.org/Publication/Downloads/Downloads%202012/2011%20003%20Assuring%20ROK%20and%20Japan.pdf>.

<sup>128</sup> National Intelligence Council, *Global Trends 2030: Alternative Worlds* (Washington, D.C.: National Intelligence Council, December 2012), p. 69, available at [http://www.dni.gov/files/documents/GlobalTrends\\_2030.pdf](http://www.dni.gov/files/documents/GlobalTrends_2030.pdf).

<sup>129</sup> Cartwright, et al., *Global Zero U.S. Nuclear Policy Commission Report*, op. cit., pp. 5, 10, 11.

<sup>130</sup> *Ibid.*, pp. 1-2.

<sup>131</sup> Drell and Goodby, *What are Nuclear Weapons For?*, loc. cit.; and remarks by Tauscher, "The Second Annual Nuclear Deterrence Summit," op. cit.

<sup>132</sup> Richardson, "Shifting from a Nuclear Triad to a Nuclear Dyad," op. cit., pp. 8-9.

<sup>133</sup> For example, see Mark Schneider, *The Nuclear Forces and Doctrine of the Russian Federation* (Fairfax, VA: National Institute Press, 2006), available at <http://www.nipp.org/National%20Institute%20Press/Current%20Publications/PDF/Russian%20nuclear%20doctrine%20--%20NSF%20for%20print.pdf>.

<sup>134</sup> Department of Defense, *Nuclear Posture Review Report* (Washington, D.C.: Department of Defense, April 2010), p. v.

<sup>135</sup> Mark Schneider, "The Nuclear Doctrine and Forces of the People's Republic of China," *Comparative Strategy*, Vol. 28, No. 3 (July-August 2009), pp. 246-248.

- <sup>136</sup> Department of Defense, *Annual Report on the Military Power of the People's Republic of China* (Washington, D.C.: Department of Defense, 2004), p. 9.
- <sup>137</sup> "Russia's Deputy Defense Minister Yuriy Borisov Met with Representatives of the Media," *Center for Analysis of the World Arms Trade*, January 17, 2003, available at <http://wnc.dialog.com/>; Keith Richburg, "China's increasing military spending unnerves neighbors," *Washington Post*, October 23, 2012, available at [http://articles.washingtonpost.com/2012-10-23/world/35501019\\_1\\_chinese-diplomats-luo-yuan-military-growth](http://articles.washingtonpost.com/2012-10-23/world/35501019_1_chinese-diplomats-luo-yuan-military-growth); and Schneider, "The Nuclear Doctrine and Forces of the People's Republic of China," op. cit., pp. 245, 258.
- <sup>138</sup> Konstantin Kosachev, "Christmas Vigils," *Ekho Moskvyy Online*, January 8, 2011, available at <http://wnc.dialog.com/>.
- <sup>139</sup> *The Military Doctrine of the Russian Federation*, February 5, 2010, available at [https://www.carnegieendowment.org/files/2010russia\\_military\\_doctrine.pdf](https://www.carnegieendowment.org/files/2010russia_military_doctrine.pdf).
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- <sup>249</sup> See for example, Raymond L. Garthoff, *Reflections on the Cuban Missile Crisis*, revised edition (Washington, D.C.: Brookings Institution, 1989), pp. 21-24; and, "The Malin Notes: Glimpses Inside the Kremlin during the Cuban Missile Crisis," Introduction by Timothy Naftali, *Cold War International History Project Bulletin*, Issue 17/18 (Fall 2012), pp. 299-301.
- <sup>250</sup> Walter Millis and E.S. Duffield, eds., *The Forrestal Diaries* (New York: Viking Press, 1951), p. 458; and, Steven L. Rearden, *History of the Office of the Secretary of Defense, Vol. I: The Formative Years, 1947-1950* (Washington, D.C.: Historical Office, Office of the Secretary of Defense, 1984), p. 439.
- <sup>251</sup> Cotter, "Peacetime Operations: Safety and Security," op. cit., pp. 42-52; and, L. Wainstein et al., *The Evolution of U.S. Strategic Command and Control and Warning, 1945-1972*, Study S-467 (Arlington, VA: Institute for Defense Analyses, June 1975) (Top Secret; Sanitized), available at <http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=ADA331702>.
- <sup>252</sup> Bruce G. Blair, *The Logic of Accidental Nuclear War* (Washington, D.C.: Brookings Institution, 1993), pp. 90-107.
- <sup>253</sup> *The Nuclear Matters Handbook—Expanded Edition* (Washington, D.C.: Office of the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs, 2011), pp. 70-72.
- <sup>254</sup> National Intelligence Council, *Annual Report to Congress on the Safety and Security of Russian Nuclear Facilities and Military Forces*, February 2002, p. 6.
- <sup>255</sup> Robert S. Norris and Hans M. Kristensen, "Global Nuclear Weapons Inventories, 1945-2010," *Bulletin of the Atomic Scientists*, Vol. 66, No. 4 (July 2010), p. 82.
- <sup>256</sup> Robert S. Norris and Hans M. Kristensen, "Worldwide Deployment of Nuclear Weapons, 2009," *Bulletin of the Atomic Scientists*, Vol. 65, No. 6 (November/December 2009), pp. 86-88, 92-94. As Matthew Bunn explains, "consolidating nuclear weapons and materials at fewer sites is an absolutely critical element of nuclear security. With fewer sites to protect, greater security can be achieved at lower cost, and there are fewer teams of insiders with access to the stockpiles and fewer opportunities for mistakes to lead to critical security vulnerabilities." *Securing the Bomb 2008* (Cambridge, MA, and Washington, D.C.: Project on Managing the Atom, Harvard University, and Nuclear Threat Initiative, November 2008), p. 44.
- <sup>257</sup> Senate Armed Services Committee, *Recent False Alerts from the Nation's Missile Attack Warning System*, Report of Senator Gary Hart and Senator Barry Goldwater, Committee Print, 96<sup>th</sup> Cong., 2<sup>nd</sup> Sess. (Washington, D.C.: GPO, 1980).

<sup>258</sup> David Hoffman, "I Had a Funny Feeling in My Gut," *Washington Post*, February 10, 1999, p. A19; and, Geoffrey Forden, *Reducing a Common Danger: Improving Russia's Early Warning System*, Policy Analysis No. 399 (Washington, D.C.: Cato Institute, May 3, 2001), pp. 5-6, available at <http://www.cato.org/download/sites/cato.org/files/pubs/pdf/pa399.pdf>.

<sup>259</sup> See Thomas C. Schelling and Morton H. Halperin, *Strategy and Arms Control* (New York: The Twentieth Century Fund, 1961), pp. 2, 17.

<sup>260</sup> Spurgeon Keeny, "Provisions of the NPT and Associated Problems," Memorandum to Henry Kissinger, January 24, 1969, declassified, p. 5, available at <http://2001-2009.state.gov/r/pa/ho/frus/nixon/e2/83203.htm>.

<sup>261</sup> "Desiring to further the easing of international tension and the strengthening of trust between States in order to facilitate the cessation of the manufacture of nuclear weapons, the liquidation of all their existing stockpiles, and the elimination from national arsenals of nuclear weapons and the means of their delivery pursuant to a Treaty on general and complete disarmament under strict and effective international control." Preamble available at <http://www.un.org/disarmament/WMD/Nuclear/NPTtext.shtml>.

<sup>262</sup> "Decision Three: Extension of the Treaty on the Non-Proliferation of Nuclear Weapons," in 1995 Review and Extension Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, *Final Document Part II*, New York, 1995, NPT/CONF.1995/32 (Part II), available at [www.un.org/Depts/ddar/nptconf/162.htm](http://www.un.org/Depts/ddar/nptconf/162.htm).

<sup>263</sup> "Remarks by President Barack Obama, Hradcany Square, Prague, Czech Republic, April 5, 2009, available at [www.whitehouse.gov/the\\_press\\_office/Remarks-By-President-Barack-Obama-in-Prague-As-Delivered](http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-in-Prague-As-Delivered).

<sup>264</sup> The full sentence in the Final Document is as follows: "In implementing the unequivocal undertaking by the nuclear-weapon States to accomplish the total elimination of their nuclear arsenals, the nuclear-weapon States commit to undertake further efforts to reduce and ultimately eliminate all types of nuclear weapons, deployed and non-deployed, including through unilateral, bilateral and multilateral measures." 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, *Final Document, Volume I*, New York, 2010, NPT/CONF.2010/50 (Vol. I), available at [www.un.org/en/conf/npt/2010/](http://www.un.org/en/conf/npt/2010/).

<sup>265</sup> *Fact Sheet: Increasing Transparency in the US Nuclear Weapons Stockpile*, May 3, 2010, available at [www.defense.gov/npr/docs/10-05-03\\_Fact\\_Sheet\\_US\\_Nuclear\\_Transparency\\_FINAL\\_W\\_DATE.pdf](http://www.defense.gov/npr/docs/10-05-03_Fact_Sheet_US_Nuclear_Transparency_FINAL_W_DATE.pdf).

<sup>266</sup> *Fact Sheet: Increasing Transparency*, op. cit.

<sup>267</sup> See for example, "Saenuri Calls for Nuclear Capability to Deter the North," *Korean Joongang Daily*, February 9, 2013 (quoting Representative Shim Jae-cheol of the ruling Senuri Party).

<sup>268</sup> See for example, Nuclear Threat Initiative, *Country Profile: South Korea* (updated January 2013), available at <http://www.nti.org/country-profiles/south-korea/>.

<sup>269</sup> Hidemichi Katsumata, "Japan Should Create Own Umbrella," *The Daily Yomiuri (Internet version)*, Tokyo December 19, 2007, transcribed in Open Source Center, Doc. ID: JPP20071219969087.

<sup>270</sup> "Inside the Ring," *Washington Times*, June 15, 2011, <http://www.washingtontimes.com/news/2011/jun/15/inside-the-ring-380739054/?page=3>.

<sup>271</sup> "Senate Armed Services Committee Holds Hearing on the Report of the Congressional Commission on the Strategic Posture of the United States," *CQ Congressional Transcripts*, Congressional Hearings, May 7, 2009, pp. 19-20.

<sup>272</sup> International Security Advisory Board, *Report on Discouraging a Cascade of Nuclear Weapon States*, loc. cit.

<sup>273</sup> See Robert G. Joseph, *Countering WMD: The Libyan Experience* (Fairfax, VA: National Institute Press, 2009).

<sup>274</sup> See Harald Müller, "A Nuclear Nonproliferation Test: Obama's Nuclear Policy and the 2010 Review Conference," *Nonproliferation Review*, Vol. 18, No. 1 (March 2011), pp. 228-29 (recounting that Germany used the new Obama approach as an opportunity to press for *additional* American cuts, Norway used the occasion to make unprecedentedly "radical and pronounced" disarmament demands, and Poland found itself unable to stick to its initially-preferred position in support of *earlier* American policy and was pressured by other Europeans into calling for *more* U.S. reductions).

<sup>275</sup> "Tehran Declaration: The Declaration of the XVI Summit of the Heads of State or Government of the Member Countries of the Non-Aligned Movement Issued 30-31 August 2012," p. 6, available at [http://www.mea.gov.in/Images/pdf/tehran\\_declaration.pdf](http://www.mea.gov.in/Images/pdf/tehran_declaration.pdf); see generally, Thomas Erdbrink, "Non-Aligned Nations Back Iran's Nuclear Bid, Not Syria," *New York Times* (August 31, 2012), available at

[http://www.nytimes.com/2012/09/01/world/middleeast/iran-criticizes-egypts-mohamed-morsi-over-syria-comments.html?\\_r=0](http://www.nytimes.com/2012/09/01/world/middleeast/iran-criticizes-egypts-mohamed-morsi-over-syria-comments.html?_r=0).

<sup>276</sup> 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, *Final Document, Volume I*, op. cit., pp. 2-3, 12-14.

<sup>277</sup> *Ibid.*, pp. 19-27.

<sup>278</sup> See, Perry and Schlesinger, et al., *America's Strategic Posture*, op. cit., p. 13; and, Schneider, "Russian Violations of Its Arms Control Obligations," op. cit., pp. 336-341.

<sup>279</sup> Susan J. Koch, *The Presidential Nuclear Initiatives of 1991-1992* (Washington, D.C.: National Defense University, 2012), pp. 21-22.

<sup>280</sup> See Perry and Schlesinger, *America's Strategic Posture*, op. cit., p. 83.

<sup>281</sup> See for example, Mark B. Schneider, *Russian Nuclear Modernization* (Fairfax, VA: National Institute for Public Policy, 2012), p. 7, 9.

<sup>282</sup> See for example, Lyle J. Goldstein and Andrew Erickson, *China's Nuclear Force Modernization* (Newport, RI: U.S. Naval War College, 2005), pp. 41, 51, 55, 102-03.

<sup>283</sup> See, Department of Defense, *Nuclear Posture Review Report*, op. cit., pp. 5-6, 28.

<sup>284</sup> Lora Saalman, "China & the U.S. Nuclear Posture Review," (Washington, D.C.: Carnegie Endowment for International Peace, February 2011), pp. 22-23; Rose Gottemoeller and Edward L. Warner III, written response for the record, in Senate Foreign Relations Committee, *The New START Treaty* (Treaty Doc. 111-5), Senate Hearing 111-738, 111<sup>th</sup> Cong., 2<sup>nd</sup> Sess. (Washington, D.C.: GPO, 2010), p. 245; Sergey Karaganov, "Russia and the United States: A Returning," *Rossiyskaya Gazeta Online*, June 2, 2009, available at <http://toolkit.dialog.com/intranet/cgi/present?STYLE=739318018&PRESENT=DB=985,AN=281800061,FM=9,SEARCH=MD.GenericSearch>; and, Elaine M. Grossman, "Russian Experts Question Role of Conventional 'Prompt Global Strike' Weapons," *Global Security Newswire*, April 7, 2009, available at <http://www.nti.org/gsn/article/russian-experts-question-role-of-conventional-prompt-global-strike-weapons/>.

<sup>285</sup> See for example, Victor Mallet, "India working on advanced nuclear missile," *FT.com*, February 8, 2013, available at <http://www.ft.com/cms/s/0/3e1410e0-71e9-11e2-886e-00144feab49a.html#axzz2MFZKTWU2>.

<sup>286</sup> Quoted in Melanie Kirkpatrick, "Why We Don't Want a Nuclear-Free World," *Wall Street Journal*, July 13, 2009, available at: <http://online.wsj.com/article/SB124726489588925407.html>.

<sup>287</sup> Evans and Kawaguchi, *Eliminating Nuclear Threats*, op. cit., p. 70.

<sup>288</sup> Cartwright, et al., *Global Zero U.S. Nuclear Policy Commission Report*, op. cit., pp. 6-9.

<sup>289</sup> *Ibid.*, p. 4.

<sup>290</sup> In a 2011 report, the Defense Science Board concluded that the survivability of theater conventional forces against nuclear EMP "is at best unknown." See, *Interim Report of the Defense Science Board (DSB) Task Force on the Survivability of Systems and Assets to Electromagnetic Pulse (EMP) and Other Nuclear Weapon Effects (NWE)* (Washington, D.C.: Defense Science Board, August 2011), available at <http://www.acq.osd.mil/dsb/reports/ADA550250.pdf>.

<sup>291</sup> See Schneider, "Zero Deterrent?," op. cit., p. 52.

<sup>292</sup> The Committee on the Effects of Nuclear Earth-Penetrator and Other Weapons, National Research Council Division on Engineering and Physical Sciences, *Effects of Nuclear Earth-Penetrator and Other Weapons* (Washington, D.C.: The National Academies Press, 2005), available at <http://www.nop.edu/catalog.php?record;d=11282>.

<sup>293</sup> TOA, total obligational authority, is all budget authority for a given year. MFP-1, Major Force Program 1, includes the cost to DoD for strategic nuclear forces—the cost of maintaining, modernizing and replacing strategic nuclear delivery vehicles; force operations; and the security of nuclear weapons. As defined by DoD, "Strategic forces are those organizations and associated weapon systems whose force missions encompass intercontinental or transoceanic inter-theater responsibilities. MFP-1 is further divided into strategic offensive and defensive forces, including operational management headquarters, logistics, and support organizations identifiable and associated with these major subdivisions." (The U.S. has minimal non-strategic nuclear forces.) "General purpose forces [MFP-2] are those organizations and associated weapon systems whose force mission responsibilities are, at a given point in time, limited to one theater of operations. Major Force Program 2 consists of force-oriented program elements,

including the command organizations associated with these forces, the logistic organizations organic to these forces, and the related support units that are deployed or deployable as constituent parts of military forces and field organizations. Also included are other programs, such as [Joint Chiefs of Staff]-directed and coordinated exercises, war reserve materiel ammunition and equipment, and stock funded war reserve materiel." MFP-1 does not include all costs associated with the strategic nuclear forces. The cost of developing and maintaining nuclear warheads, for example, is funded by the Department of Energy, not the Department of Defense. But even when these other costs are taken into account, the overall cost of the strategic nuclear forces currently is still no more than one-tenth that of the general purpose forces. See Russell Rumbaugh and Nathan Cohn, *Resolving Ambiguity: Costing Nuclear Weapons* (Washington, D.C.: Henry L. Stimson Center, June 2012), pp. 32-50.

<sup>294</sup> Mies, "Strategic Deterrence in the 21<sup>st</sup> Century," op. cit., p. 17.

<sup>295</sup> Gregory W. Pedlow, "NATO Strategy Documents 1949-1969," NATO, pp. XVI-XVII, available at <http://www.nato.int/docu/stratdoc/eng/intro.pdf>.

<sup>296</sup> Edward J. Dria, *Secretaries of Defense Historical Series—McNamara, Clifford, and the Burdens of Vietnam 1965-1969*, (Washington, D.C.: Historical Office of the Secretary of Defense, 2011), p. 540, available at [http://history.defense.gov/resources/OSDSeries\\_Vol6.pdf](http://history.defense.gov/resources/OSDSeries_Vol6.pdf).

<sup>297</sup> These are the reasons for the current Russian emphasis on nuclear weapons. See "Statement for the Record Worldwide Threat Assessment of the US Intelligence Community Senate Select Committee on Intelligence, James R. Clapper, Director of National Intelligence," March 12, 2013, p. 24, available at: <http://intelligence.senate.gov/130312/clapper.pdf>.

<sup>298</sup> "Deterrence and Defense Policy Review," NATO, May 20, 2012, available at: [http://www.nato.int/cps/en/SID5FA9EA63-48F5B397/natolive/official\\_texts\\_87597.htm](http://www.nato.int/cps/en/SID5FA9EA63-48F5B397/natolive/official_texts_87597.htm). See also NATO, *Lisbon Summit Declaration*, op. cit., p. 8.

<sup>299</sup> "Fact Sheet DOE Plan Promises Additional Nuclear Reductions, But Few Cost Savings," *Federation of American Scientists*, July 13, 2010, available at [http://www.fas.org/press/\\_docs/fact\\_sheet.html](http://www.fas.org/press/_docs/fact_sheet.html).

<sup>300</sup> Douglas P. Guarin, "NNSA: Nuclear Stockpile Reductions Don't Necessarily Equal Cost Savings," *Global Security Newswire*, February 14, 2013, available at <http://www.nti.org/gsn/article/nnsa-nuclear-stockpile-reductions-dont-necessarily-equal-cost-savings/>.

<sup>301</sup> U.K. Defence Secretary Philip Hammond as quoted in "British Defense Chief Rules Out Cuts to Nuclear-Armed Sub," *Global Security Newswire*, June 18, 2013, available at <http://www.nti.org/gsn/article/british-defense-chief-rules-out-cuts-nuclear-armed-sub-fleet/>.

<sup>302</sup> Ibid.

<sup>303</sup> The Republican Senate Policy Committee, "Obama Fails America on Nuclear Arms," March 12, 2012, available at <http://www.rpc.senate.gov/policy-papers/obama-fails-america-on-nuclear-arms>.

<sup>304</sup> Perry and Schlesinger, *America's Strategic Posture*, op. cit., p. 50.

<sup>305</sup> Michael Turner, "Letter to The Honorable Ed Markey," February 15, 2012, available at [http://turner.house.gov/uploadedfiles/20120215\\_-\\_turner\\_to\\_markey\\_on\\_nnsa\\_infrastructure\\_with\\_enclosure\\_vf.pdf](http://turner.house.gov/uploadedfiles/20120215_-_turner_to_markey_on_nnsa_infrastructure_with_enclosure_vf.pdf).

<sup>306</sup> Baker Spring, Peter Brookes, and James J. Carafano, "Moving Forward with Ballistic Missile Defense: A Memo to President-elect Obama," Special Report No. 26 (Washington, D.C.: The Heritage Foundation, December 2, 2008), p. 2, available at <http://www.heritage.org/research/reports/2008/12/moving-forward-with-ballistic-missile-defense-a-memo-to-president-elect-obama>.

<sup>307</sup> Committee on Conventional Prompt Global Strike Capability and National Research Council, *U.S. Conventional Prompt Global Strike: Issues for 2008 and Beyond* (Washington, D.C.: National Academies Press, 2008) pp. 2-12, 6-6.

<sup>308</sup> Ibid., p. 86.

<sup>309</sup> Greg Weaver, STRATCOM's Deputy Director for Plans and Policy, has commented, "You can't replace nuclear weapons today with conventional capability....They don't have the same effects on targets, but as a result they don't have the same effects on people's decision calculus." Quoted in Elaine M. Grossman, "Conventional Arms No Substitute for Nuclear: Strategic Command Official," *Global Security Newswire*, February 29, 2012, available at <http://www.nti.org/gsn/article/conventional-arms-no-substitute-nuclear-strategic-command-official/>.

<sup>310</sup> Gen. Kevin Chilton, USAF, in Senate Armed Services Committee, *Nuclear Posture Review*, Senate Hearing 111-824, 111<sup>th</sup> Cong., 2<sup>nd</sup> Sess., April 22, 2010, available at <http://www.gpo.gov/fdsys/pkg/CHRG-111shrg63689/html/CHRG-111shrg63689.htm>.

- <sup>311</sup> The New START Treaty, The Protocol, Agreed Statement 8, available at <http://www.state.gov/documents/organization/140047.pdf>; Mark B. Schneider, *New START: Anatomy of a Failed Negotiation* (Fairfax, VA: National Institute Press, 2012), pp. 29-30, available at <http://www.nipp.org/Publication/Downloads/Downloads%202012/New%20START%20Final%20for%20web.pdf>.
- <sup>312</sup> *Ibid.*, pp. 12, 17-18.
- <sup>313</sup> An indication of the cost of an effort to try to replace nuclear weapons with conventional capability is the cost of the new strategic bomber. The Air Force seeks to hold the unit cost to \$550 million each. John A. Tirpak, "Time To Get Started," *Air Force Magazine*, February 2012, available at <http://www.airforce-magazine.com/MagazineArchive/Pages/2012/February%202012/0212time.aspx>.
- <sup>314</sup> *Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack*, Volume 1, 2004, op. cit. p. 48.
- <sup>315</sup> *Interim Report of the Defense Science Board (DSB) Task Force on the Survivability of Systems and Assets to Electromagnetic Pulse (EMP) and Other Nuclear Weapon Effects (NWE)*, op. cit.
- <sup>316</sup> *Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack*, loc. cit.
- <sup>317</sup> *Interim Report of the Defense Science Board (DSB) Task Force on the Survivability of Systems and Assets to Electromagnetic Pulse (EMP) and Other Nuclear Weapon Effects (NWE)*, op. cit.
- <sup>318</sup> *Ibid.*
- <sup>319</sup> The Heritage Foundation sums up the current situation: "The military's general purpose forces...remain vulnerable to the effects of an EMP attack. Those forces' increasing reliance on high technology in fact makes an EMP attack an attractive option for potential enemies." Carafano, Spring and Weitz, *Before the Lights Go Out*, op. cit.
- <sup>320</sup> Graham, "Statement Before the House Armed Services Committee," loc. cit.
- <sup>321</sup> *Ibid.*, p. 5.
- <sup>322</sup> Cartwright, et al., *Global Zero U.S. Nuclear Policy Commission Report*, op. cit., pp. 6, 17.
- <sup>323</sup> Lawrence Freedman, "The Rationale for Medium-Sized Deterrent Forces," in, Christopher Bertram, ed., *The Future of Strategic Deterrence* (Hamden, CT: Archon, 1981), p. 52.
- <sup>324</sup> See for example, Kingston Reif, "Nuclear Myths (and Realities)," *Bulletin of the Atomic Scientists*, January 15, 2013, at <http://www.thebulletin.org/node/9547>.
- <sup>325</sup> Testimony before the House Appropriations Committee, Subcommittee on Energy and Water, February 14, 2013.
- <sup>326</sup> National Research Council, Committee on Conventional Prompt Global Strike Capability, *U.S. Conventional Prompt Global Strike: Issues for 2008 and Beyond* (Washington, D.C.: National Academies Press, 2008), p. 40, available at, <http://www.nap.edu/catalog/12061.html>.
- <sup>327</sup> As reported in Felgenhauer, "Russia Prepares for War with the US and NATO," op. cit..
- <sup>328</sup> Felgenhauer, "The Uphill Job of Mending Fences with the Kremlin," op. cit.
- <sup>329</sup> Felgenhauer, "Putin Believes US-Russian Relations Are Dominated by Zero Sum Game," op. cit.
- <sup>330</sup> "Japanese Claim on Okinawa Challenged in China," *RT*, May 9, 2013, at, <http://rt.com/news/china-japan-okinawa-ownership-018/>.
- <sup>331</sup> See for example, "The Nuclear Forces and Doctrine of the Russian Federation and the People's Republic of China," October 14, 2011, Testimony prepared by Dr. Mark B. Schneider, available at, [http://armedservices.house.gov/index.cfm/hearings-display?ContentRecord\\_id=798a4a17-2a63-45b7-ae79-4629c32dfdd7&Statement\\_id=c9fe3c83-cd34-421c-b98c-ac29bdca094b&ContentType\\_id=14f995b9-dfa5-407a-9d35-56cc7152a7ed&Group\\_id=41030bc2-0d05-4138-841f-90b0fbaa0f88&MonthDisplay=10&YearDisplay=2011](http://armedservices.house.gov/index.cfm/hearings-display?ContentRecord_id=798a4a17-2a63-45b7-ae79-4629c32dfdd7&Statement_id=c9fe3c83-cd34-421c-b98c-ac29bdca094b&ContentType_id=14f995b9-dfa5-407a-9d35-56cc7152a7ed&Group_id=41030bc2-0d05-4138-841f-90b0fbaa0f88&MonthDisplay=10&YearDisplay=2011).
- <sup>332</sup> Even now, for example, Russian experts say that Russian defenses in the future would reduce Russian damage expectancy to ten percent if the US follows Minimum Deterrence recommendations. No one knows if such a threat will prove adequate to deter in the future. See, Sergey Rogov, Viktor Yesin, Pavel Zolotarev and Valentin Kuznetsov, "Russia: Experts on Why US, Russia Are Unable to Agree on Missile Defense," *Nezavisimoye Voyennoye Obozreniye*, Online, September 22, 2012, available at <http://www.wnc.dialog.com/>.

<sup>333</sup> Spurgeon Keeny, "Provisions of the NPT and Associated Problems," memorandum to Henry Kissinger, January 24, 1969, [declassified], p. 5, available at <http://2001-2009.state.gov/r/pa/ho/frus/nixon/e2/83203.htm>.

<sup>334</sup> See Jiyeon Kim, Karl Friedhoff, Chungky Kang, "The Fallout: South Korean Public Opinion Following North Korea's Third Nuclear Test," The Asian Institute for Policy Studies, *Issue Brief*, No. 46 (February 25, 2013), pp. 7-8. See also, Martin Fackler and Choe Sang-Hun, "As North Korea Blusters, South Flirts with Talk of Nuclear Arms," *New York Times*, March 11, 2013; and, Barbara Demick, "More South Koreans Support Developing Nuclear Weapons," *Los Angeles Times*, May 18, 2013, available at <http://articles.latimes.com/2013/may/18/world/la-fg-south-korea-nuclear-20130519>.

<sup>335</sup> Lee Chi-dong, "S. Korea needs tactical nuke to send message to China: Rep. Chung," *Yonhap News Agency*, April 14, 2013.

<sup>336</sup> National Institute for Defense Studies, *East Asian Strategic Review 2010*, op. cit., pp. 33-34.

<sup>337</sup> For an examination of possible surprises, see Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics, *Report of the Defense Science Board 2008 Summer Study on Capability Surprise*, Vol. 1: Main Report, September 2009.

<sup>338</sup> See for example, Futter and Zala, "Advanced US Conventional Weapons and Nuclear Disarmament," loc. cit.

<sup>339</sup> *Ibid.*, pp. 25-26, 29.

<sup>340</sup> Tom Nichols, "Time to Change America's Atomic Arsenal," *The Diplomat*, March 14, 2013, at <http://thediplomat.com/2013/03/14/time-to-change-americas-atomic-arsenal/>.

<sup>341</sup> Chilton, *The New START (Strategic Arms Control and National Security) Treaty: Views From the Pentagon*, op. cit., pp. 18-19.

<sup>342</sup> Quoted in Grossman, "U.S. Nuclear Commander Warns Against Rushing Further Arms Cuts," op. cit.

<sup>343</sup> Press Briefing by Press Secretary Jay Carney, Office of the Press Secretary, The White House, March 7, 2013.

<sup>344</sup> Department of Defense, Defense Science Board, *Resilient Military Systems and the Advanced Cyber Threat*, January 2013, pp. 15, 42.

<sup>345</sup> See Perry and Schlesinger, *America's Strategic Posture*, op. cit.

<sup>346</sup> *Ibid.*, pp. 25-26, 29.

<sup>347</sup> See Paul Kennedy, *The Rise and Fall of British Naval Mastery* (New York: Humanity Books, 1998), p. 273.

<sup>348</sup> *Ibid.*, p. 279.

<sup>349</sup> *Ibid.*, p. 274.

<sup>350</sup> George F. Kennan, *Realities of American Foreign Policy* (London: Oxford University Press, 1954), pp. 20-23.





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## Appendix

### Information Used for Figure 4: Nuclear Numbers and Nuclear Dangers

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#### United States

##### Number of U.S. Nuclear Weapons

All weapons in the U.S. nuclear stockpile are counted. The numbers are those made public by the Departments of Energy and Defense.<sup>1</sup> They include both strategic and non-strategic weapons and active as well as inactive weapons. Strategic weapons are those that arm heavy bombers (the B-52, for example), intercontinental ballistic missiles (ICBMs), and submarine-launched ballistic missiles (SLBMs). Non-strategic weapons historically have included bombs for dual-capable aircraft, warheads for sea- and ground-launched cruise missiles, artillery-fired projectiles, and warheads for air defense missiles, along with other weapon types. Active weapons are maintained in an operational status and include those loaded on missiles and aircraft, stored at bases and depots, retained to augment deployed weapons in a short time, and used as logistics spares. Inactive weapons lack some of the critical components of active weapons but can be made operational when provided with these parts.<sup>2</sup>

##### Number of U.S. Nuclear Weapons-Related Accidents

The accident numbers are from a list an academic researcher compiled from a variety of open sources. They cover the period 1950 to 1989. While not by any means authoritative, the list appears to be the best available, given the secrecy generally surrounding such occurrences. Included are crashes or fires involving nuclear-armed or -capable aircraft, bombs unintentionally dropped or deliberately jettisoned from aircraft, collisions or fires involving nuclear-armed or -capable surface ships and submarines, explosions or malfunctions of nuclear-armed or -capable missiles, and accidents involving trains, trucks or aircraft used to transport nuclear weapons.<sup>3</sup>

As noted in the main text, the Department of Defense (DoD) released a list of 32 nuclear weapons accidents that happened between 1950 and 1980.<sup>4</sup> The DoD list is considerably

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<sup>1</sup> Department of Defense and Department of Energy, "Summary of Declassified Nuclear Stockpile Information," fact sheet released at Department of Energy Openness Press conference, June 27, 1994; and, Department of Defense, "Increasing Transparency in the U.S. Nuclear Weapons Stockpile," fact sheet, May 3, 2010, available at [http://www.defense.gov/npr/docs/10-05-03\\_fact\\_sheet\\_us\\_nuclear\\_transparency\\_final\\_w\\_date.pdf](http://www.defense.gov/npr/docs/10-05-03_fact_sheet_us_nuclear_transparency_final_w_date.pdf).

<sup>2</sup> *The Nuclear Matters Handbook—Expanded Edition* (Washington, D.C.: Office of the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs, 2011), pp. 30-33, 38-39.

<sup>3</sup> Shaun Gregory, *The Hidden Cost of Nuclear Deterrence: Nuclear Weapons Accidents* (London: Brassey's (UK), 1990), pp. 2, 143-184, 215-219.

<sup>4</sup> Department of Defense, *Narrative Summaries of Accidents Involving U.S. Nuclear Weapons, 1950-1980* (Washington, D.C.: Department of Defense, April 1981).

shorter than the one described above. It includes only accidents in which a nuclear weapon or radioactive weapon component definitely was involved; the other list contains accidents where one or more nuclear weapons could have been on the aircraft, surface ship, submarine or missile and the unclassified record is unclear. All 32 accidents acknowledged by DoD are included in the longer list.

### **Events Involving Increased Readiness of U.S. Nuclear Forces**

Below are brief descriptions of the occasions when the preparedness of U.S. nuclear forces was increased in the context of heightened international tension.

- **C-47s Downed over Yugoslavia (1946):** Yugoslav fighter aircraft forced down one U.S. Army C-47 air transport and shot down another. The Soviet Union was seen as supporting the attacks. Six B-29 bombers were dispatched to Europe, where they flew near the border of Soviet-occupied territory.<sup>5</sup>
- **Berlin Blockade (1948):** The Soviet Union restricted road, rail and canal access to the U.S., British and French sectors of occupied Berlin. As part of its response to the blockade, the United States placed the bombers of Strategic Air Command (SAC) on alert, sent two B-29 squadrons to Germany, and deployed two B-29 bomb groups to Britain.<sup>6</sup>
- **Korean War (1950-1953):** North Korea invaded the South in June 1950. The United States intervened militarily to turn back the invasion. U.S. officials gave some consideration to using nuclear weapons during the conflict. To threaten the Soviet Union and China, which supported North Korea, SAC B-29 bombers were flown to Britain and Guam.<sup>7</sup>
- **Suez Crisis (1956):** After Egypt nationalized the Suez Canal, Britain and France, in coordination with Israel, launched an abortive military operation to take control of the waterway and topple Egyptian President Nasser. The Soviet Union threatened to intervene and made veiled nuclear threats against the British and French. The United States reacted in part by increasing the readiness of the SAC bomber force, moving aerial tankers to northern bases, and leaving in place bombers that were on rotational training missions overseas.<sup>8</sup>

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<sup>5</sup> J.C. Hopkins and Sheldon A. Goldberg, *The Development of Strategic Air Command, 1946-1986* (Offutt Air Force Base, NE: Office of the Historian, Headquarters, Strategic Air Command, September 1, 1986), pp. 5-6. While these particular bombers had not been modified to carry atomic bombs, they were of the same type as those that bombed Hiroshima and Nagasaki the year before.

<sup>6</sup> *Ibid.*, p. 14. The bombers deployed to Germany and Britain were not armed with atomic bombs. The only bomb group with atomic-modified B-29s remained in the United States, maintaining a 24-hour alert. Steven L. Rearden, *History of the Office of the Secretary of Defense, Vol. I: The Formative Years, 1947-1950* (Washington, D.C.: Historical Office, Office of the Secretary of Defense, 1984), p. 293.

<sup>7</sup> Roger Dingman, "Atomic Diplomacy During the Korean War," *International Security*, Vol. 13, No. 3 (Winter 1988/89), pp. 50-91.

<sup>8</sup> Robert J. Watson, *History of the Office of the Secretary of Defense, Vol. IV: Into the Missile Age, 1956-1960* (Washington, D.C.: Historical Office, Office of the Secretary of Defense, 1997), pp. 66, 67; and, Hopkins and Goldberg, *The Development of Strategic Air Command*, op. cit., p. 59.

- **Lebanese Crisis (1958):** The United States sent troops to Lebanon to prevent the overthrow of that country's president and to discourage the Soviet Union from exploiting instability in the Middle East. Along with the troop deployment, additional SAC bombers were placed on ground alert; within hours, more than 1,000 aircraft were ready for takeoff.<sup>9</sup>
- **Taiwan Strait Crisis (1958):** Mainland China carried out an intensive "artillery blockade" of offshore islands held by U.S.-allied Taiwan. The United States took action to ensure resupply of the islands. It also increased the number of SAC ground-alert bombers on Guam and readied several bomber wings for possible use in the Pacific.<sup>10</sup>
- **U-2 Downing/Paris Summit (1960):** During a U.S.-Soviet summit in Paris following the interception of a U-2 reconnaissance aircraft over Soviet territory, President Eisenhower and Secretary of Defense Thomas Gates ordered a test of the military alert system. The alert condition of U.S. military forces, including the strategic nuclear forces, was increased. Gates later said the alert was not meant to be "provocative," and the level of increased readiness apparently was more than he intended.<sup>11</sup>
- **Berlin Crisis (1961):** The Soviet Union attempted to push the United States and its British and French allies out of West Berlin through diplomatic pressure and military threats. In the context of the crisis, the United States increased the portion of the SAC bomber force on ground alert from one-third to one-half and delayed the planned deactivation of six B-47 bomb wings.<sup>12</sup>
- **Cuban Missile Crisis (1962):** Soviet deployment of nuclear missiles to Cuba caused what is generally considered the gravest confrontation of the Cold War. In response to the move, the United States heightened the readiness of its nuclear forces: B-47 bombers dispersed from their home bases to other military and civilian airfields, additional bombers were placed on ground alert, one-eighth of the B-52 force participated in an airborne alert, ICBMs were placed on alert, ballistic missile submarines moved to their launch points, and non-strategic nuclear forces (shorter-range aircraft, ballistic missiles, and cruise missiles) also assumed a higher alert status.<sup>13</sup>
- **Vietnam War Negotiations (1969):** As part of a strategy for pressuring the Soviet Union to persuade North Vietnam to make concessions in the Paris peace talks, President Nixon ordered an increase in the alert level of U.S. nuclear forces. There was a stand-down of training flights for SAC bombers and tankers in order to improve operational readiness, more B-52 and B-58 bombers were placed on ground alert, some

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<sup>9</sup> Hopkins and Goldberg, *The Development of Strategic Air Command*, op. cit., p. 73.

<sup>10</sup> Loc. cit.

<sup>11</sup> Scott D. Sagan, "Nuclear Alerts and Crisis Management," *International Security*, Vol. 9, No. 4 (Spring 1985), pp. 102-106.

<sup>12</sup> Radio and Television Report to the American People on the Berlin Crisis, July 25, 1961, in *Public Papers of the Presidents of the United States: John F. Kennedy, 1961* (Washington, D.C.: GPO, 1962), pp. 535, 536; and, Hopkins and Goldberg, *The Development of Strategic Air Command*, op. cit., pp. 92, 98, 100.

<sup>13</sup> Robert S. Norris, "The Cuban Missile Crisis: A Nuclear Order of Battle, October/November 1962," presentation at the Woodrow Wilson Center, October 24, 2012.

bombers not on alert were loaded with nuclear weapons, a relatively small number of nuclear-armed B-52 bombers conducted an airborne alert as a show of force, non-SAC nuclear-capable aircraft also carried out stand-downs, and additional ballistic missile submarines went on patrol.<sup>14</sup>

- **Arab-Israeli War (1973):** The Soviet Union proposed joint U.S.-Soviet military intervention, and threatened unilateral action, to enforce a cease-fire between its Egyptian client, which found itself at a military disadvantage in the conflict, and Israel, which was supported by the United States. To reinforce diplomatic communications aimed at discouraging a Soviet move, the United States increased the defense readiness condition of all its military commands. Some SAC aerial tankers were dispersed, more bombers were placed on ground alert, B-52 bombers were brought back from Guam (where they had been based for conventional bombing missions in Southeast Asia), the ICBM force went to a somewhat higher footing, and a few more ballistic missile submarines put to sea.<sup>15</sup>

## Soviet Union

### Number of Soviet Nuclear Weapons

Unlike the U.S. government, the authorities in Moscow have not released information on the number of weapons in the Soviet/Russian nuclear stockpile by year. The numbers shown in Figure 4 are estimates produced by private researchers in the United States. The estimates include, as with the numbers for the U.S. stockpile, both strategic and non-strategic weapons. In addition to active weapons, the estimates take into account weapons held in reserve or scheduled for dismantlement. (Weapons awaiting dismantlement are not included in the U.S. numbers.)<sup>16</sup>

### Number of Soviet Nuclear Weapons-Related Accidents

The tally of Soviet accidents is taken from the same source as that for U.S. nuclear weapons-related accidents.<sup>17</sup> The Soviet list almost certainly is incomplete, however, because of the great secrecy that enveloped Soviet nuclear forces. The absence in the list of Soviet accidents prior to 1966 undoubtedly reflects a lack of information rather than a perfect Soviet safety record. The 1950s and early 1960s were a period in which nuclear weapons were introduced in the different branches of the Soviet armed forces and, along with other problems, that process must have been accompanied by accidents. (Note in this regard that an unarmed prototype of an early Soviet ICBM blew up prior to a test launch in 1960, killing the first commander of the

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<sup>14</sup> Scott D. Sagan and Jeremi Suri, "The Madman Nuclear Alert: Secrecy, Signaling, and Safety in October 1969," *International Security*, Vol. 27, No. 4 (Spring 2003), pp. 150-183; and, William Burr and Jeffrey Kimball, "Nixon's Secret Nuclear Alert: Vietnam War Diplomacy and the Joint Chiefs of Staff Readiness Test, October 1969," *Cold War History*, Vol. 3, No. 2 (January 2003), pp. 113-156.

<sup>15</sup> Barry M. Blechman and Douglas M. Hart, "The Political Utility of Nuclear Weapons: The 1973 Middle East Crisis," *International Security*, Vol. 7, No. 1 (Summer 1982), pp. 132-156; and, Douglas M. Hart, "Soviet Approaches to Crisis Management: The Military Dimension," *Survival*, Vol. 26, No. 5 (September/October 1984), pp. 214-223.

<sup>16</sup> Robert S. Norris and Hans M. Kristensen, "Global Nuclear Weapons Inventories, 1945-2010," *Bulletin of the Atomic Scientists*, Vol. 66, No. 4 (July 2010), pp. 81-82; and, Robert S. Norris and Hans M. Kristensen, "Russian Nuclear Forces, 2010," *Bulletin of the Atomic Scientists*, Vol. 66, No. 1 (January 2010), p. 76.

<sup>17</sup> Gregory, *The Hidden Cost of Deterrence*, op. cit., pp. 184-190.

Strategic Rocket Forces and dozens of others.).<sup>18</sup> Of the accidents that are recorded, most involved submarines damaged or destroyed by fires, explosions, reactor leaks or collisions. Among the other accidents was a fuel leak that caused a liquid-propellant missile to explode in its silo.

### Events Involving Increased Readiness of Soviet Nuclear Forces

The available record offers some evidence that the Soviet Union also increased the readiness of its nuclear forces in four of the previously described tense episodes with the United States. Force readiness appears to have been increased on two other occasions as well. These six cases are listed below.

- **U-2 Downing/Paris Summit (1960):** After the U.S. alert began, the Soviet air force commander is reported to have ordered airborne bombers back to their bases so that, if necessary, they could be armed with nuclear weapons.<sup>19</sup>
- **Berlin Crisis (1961):** In the course of the confrontation, the Strategic Rocket Forces and long-range bomber units, along with fighter aviation and air defense forces, assumed a posture of “heightened combat readiness.”<sup>20</sup>
- **Cuban Missile Crisis (1962):** During and after the crisis, high-ranking Soviet officials made public statements declaring that the “combat readiness” of the Strategic Rocket Forces had been increased.<sup>21</sup> In addition, the Soviet military is said to have taken steps consistent with these statements, including mating warheads with missiles, placing bombers on runway alert, and loading some of the aircraft with nuclear weapons.<sup>22</sup>
- **Invasion of Czechoslovakia (1968):** Military forces of the Soviet Union and its principal Warsaw Pact allies invaded Czechoslovakia to suppress reform efforts by the communist regime in Prague. According to former personnel of the Strategic Rocket Forces, intermediate-range ballistic missiles in the western military districts of the Soviet Union were placed at a higher alert level just before the invasion and maintained that status for a few weeks. Warheads were mated with missiles. Another source reported the combat readiness of some Soviet ballistic missile submarines also was increased.<sup>23</sup>

<sup>18</sup> Boris Chertok, *Rockets and People, Vol. II: Creating a Rocket Industry* (Washington, D.C.: National Aeronautics and Space Administration History Division, June 2006), pp. 598-634.

<sup>19</sup> Bruce G. Blair, *The Logic of Accidental Nuclear War* (Washington, D.C.: Brookings Institution, 1993), p. 23.

<sup>20</sup> Bruce W. Menning, “The Berlin Crisis from the Perspective of the Soviet General Staff,” in William W. Epley, ed., *International Cold War Military Records and History: Proceedings of the International Conference on Cold War Military Records and History Held in Washington, D.C., 21-26 March 1994* (Washington, D.C.: Office of the Secretary of Defense, 1996), pp. 54-55.

<sup>21</sup> Norris, “The Cuban Missile Crisis,” op. cit.; and Blair, *The Logic of Accidental Nuclear War*, op. cit., p. 289.

<sup>22</sup> Scott D. Sagan, *The Limits of Safety: Organizations, Accidents, and Nuclear Weapons* (Princeton, NJ: Princeton University Press, 1993), pp. 143-145; Blair, *The Logic of Accidental Nuclear War*, op. cit., pp. 23-25; and Michael Dobbs, *One Minute to Midnight: Kennedy, Khrushchev, and Castro on the Brink of Nuclear War* (New York: Alfred A. Knopf, 2008), pp. 188, 190.

<sup>23</sup> Blair, *The Logic of Accidental Nuclear War*, op. cit., p. 25. The Soviet general who served as the deputy commander of the invasion has disputed these claims, saying that the Soviet leadership considered, but quickly rejected, ordering an alert. Ivan Ershov, quoted in Mark Kramer, “The Prague Spring and the Soviet Invasion of Czechoslovakia: New Interpretations” (second of two parts), *Cold War International History Project Bulletin*, Issue 3 (Fall 1993), pp. 11-12.

(During the 1969 border clashes between the Soviet Union and China, there was a stand-down of the Soviet air forces within Soviet territory and in Eastern Europe.<sup>24</sup> Many Soviet strike aircraft were capable of carrying either conventional or nuclear weapons. The purpose of the stand-down was unclear, although it could have been part of preparations for an attack. Based on available evidence, it does not appear that the alert level of Soviet nuclear forces, including the Strategic Rocket Forces, was increased in the course of the crisis).

- ***Arab-Israeli War (1973)***: A “Soviet source familiar with the episode” has said that an increase in the combat readiness of a portion of the Strategic Rocket Forces was ordered during the U.S.-Soviet confrontation, but canceled when the U.S. military alert ended.<sup>25</sup>
- ***NATO Able Archer Exercise (1983)***: Able Archer was an annual NATO command post exercise. The 1983 exercise, which Soviet intelligence monitored, included the simulated release of nuclear weapons. The exercise took place in a period of heightened tension between the Soviet Union and the West. Among other Soviet reactions to the exercise, “air units in [East] Germany and Poland” assumed a “high alert status with readying of nuclear strike forces.”<sup>26</sup>

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<sup>24</sup> Office of the Historian, Department of State, *Foreign Relations of the United States, 1969-1976, Vol. XXXIV: National Security Policy, 1969-1972* (Washington, D.C.: GPO, 2011), pp. 234-235.

<sup>25</sup> Blair, *The Logic of Accidental Nuclear War*, op. cit., pp. 25-26.

<sup>26</sup> Director of Central Intelligence, *Implications of Recent Soviet Military-Political Activities*, SNIE 11-10-84/JX, May 18, 1984 (Top Secret; Sanitized), pp. 1, 4, available at [http://www.foia.cia.gov/sites/default/files/document\\_conversions/89801/DOC\\_0000278546.pdf](http://www.foia.cia.gov/sites/default/files/document_conversions/89801/DOC_0000278546.pdf). See also, Ben B. Fischer, *A Cold War Conundrum: The 1983 Soviet War Scare*, CSI 97-10002 (Washington, D.C.: Center for the Study of Intelligence, Central Intelligence Agency, September 1997), pp. 24-26.