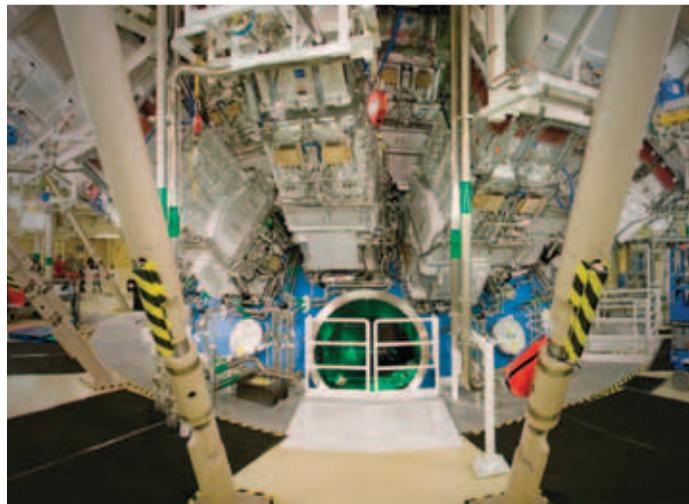
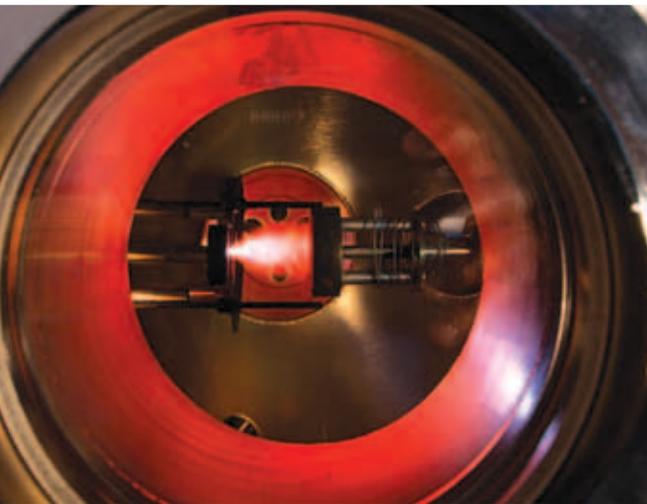


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Nuclear Scholars Initiative

PROJECT ON NUCLEAR ISSUES

A COLLECTION OF PAPERS FROM THE 2011 NUCLEAR SCHOLARS INITIATIVE

Nuclear Scholars Initiative

A Collection of Papers
from the
2011 Nuclear Scholars Initiative

PROJECT ON NUCLEAR ISSUES
Center for Strategic and International Studies
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Introduction and Acknowledgments

The 2011 Nuclear Scholars Initiative featured an outstanding class of 20 graduate students and young professionals from across the United States, as well as one from the United Kingdom. Together, they participated in six monthly workshops that covered various aspects of U.S. nuclear weapons policy. Sessions focused on the Nuclear Posture Reviews; deterrence, extended deterrence, and assurance; the technical aspects of nuclear modernization and verification; arms control; and nuclear security. The program culminated in a final meeting where the scholars presented their own research, the results of which are contained in this year's journal.

The Project on Nuclear Issues (PONI) is deeply appreciative of these scholars' outstanding work as well as the contributions of many others. Special thanks are due to Linton Brooks, Clark Murdock, Martin Whelan, and Amy Woolf, who provided feedback at the last session, as well as to Eli Jacobs, Kelley Saylor, Stephanie Spies, and the CSIS publications team for their help in editing and formatting the papers. We would also like to recognize the other members of the 2011 class who were unable to contribute a paper to this journal but provided valuable contributions to meeting discussions: Justin Fernandez, Joel Forrester, Patrick Lynch, Sarah Poe, Rachel Whitlark, and John Yi.

PONI would also like to thank Frank Miller and Sharon Squassoni who, along with PONI director Clark Murdock, each committed a substantial amount of their time to organizing and chairing one of the monthly meetings. Linton Brooks deserves special recognition for helping to organize and chair a number of the meetings and for sharing his invaluable knowledge over the course of the program. Each year, the Nuclear Scholars Initiative depends entirely on the involvement of experts willing to take time out of their extraordinarily busy schedules. This year's class is extremely grateful to James Acton, David Albright, Elaine Bunn, Susan Burk, Elbridge Colby, Charles Ferguson, Michael Gerson, John Harvey, Edward Ifft, Duyeon Kim, Burgess Laird, Jeffrey Lewis, Robert Nurick, George Perkovich, George Quester, Brad Roberts, Thomas Scheber, Ray Takeyh, Martin White, and Amy Woolf for coming to speak with the group.

Last but not least, we would like to thank our partners at the Defense Threat Reduction Agency and the National Nuclear Security Administration for making this project possible with their consistent support.

John Warden
Program Coordinator
Project on Nuclear Issues

The Impact of “Conventional” Roadblocks on U.S.-Russian Stockpile Reductions

Alexis A. Blanc

To address real threats to its security and that of its allies, the United States has outlined a policy that reduces the role of nuclear weapons and emphasizes the development of niche capabilities like ballistic missile defense and prompt global strike. As part of its strategy to combat the proliferation of nuclear weapons and preclude a terrorist attack with weapons of mass destruction, the United States is also emphasizing the importance of arms control agreements and further stockpile reductions. Unfortunately, the United States’ shift away from nuclear weapons and toward capabilities such as missile defense and conventional strike will likely exacerbate Russian perceptions of the threat environment. As a result, Russia will reemphasize the essential role that nuclear weapons have in its national security strategy, potentially compromising efforts to work toward future nuclear weapons reductions.

Introduction

Successive presidential administrations have recognized that during the past two decades, the main threat to U.S. national security has transitioned from great power near-peers to nonstate actors, rogue states that are proliferating as a result of technology diffusion, and invisible threats from cyberspace. Because these threats are not readily deterred by nuclear weapons, the *2010 Nuclear Posture Review Report (NPR)* found that the United States could make changes to its nuclear posture—and in fact needed to reduce its reliance on, and the size of, its nuclear stockpile—to increase its security and that of its allies. Furthermore, to address these threats, the *NPR* articulated a broad strategy that includes securing vulnerable nuclear materials worldwide, thwarting proliferation networks, ensuring a robust nuclear forensic and attribution capability, pursuing further arms control agreements, and reinvigorating the nonproliferation regime.¹

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1. U.S. Department of Defense, *Nuclear Posture Review Report*, April 2010, www.defense.gov/npr/docs/2010%20nuclear%20posture%20review%20report.pdf.

The *NPR* also emphasized the growing importance of unique conventional capabilities like ballistic missile defense and conventional prompt global strike for providing a more credible, effective means to combat threats from both state and nonstate actors. These capabilities have an undeniable potential to contribute to U.S. and allied security; yet both systems also have potential drawbacks, such as having a negative impact on U.S. arms control objectives. The United States is in a position of conventional superiority, and these systems can only reinforce the status quo. In response, countries that are at a conventional disadvantage will likely reemphasize the importance of their unconventional capabilities in order to counterbalance U.S. conventional superiority—and Russia fits squarely into this category. Furthermore, Russia’s perspective on its security environment, real or imagined, is very different from the U.S. perspective. For example, Russia does not perceive the same threat from Iran that the United States does.

In addition, domestic and economic imperatives have further entrenched the role of nuclear weapons in Russian national security. The Barack Obama administration has gone to great lengths to reassure Russia’s political and military elite that these capabilities are not postured against Russia. Unfortunately, there is a very real possibility that these reassurances will be insufficient, regardless of whether current U.S. plans for both systems actually pose a threat to Russia’s deterrent. All these factors make the prospects for a follow-on arms control agreement very grim. Policymakers should reconsider their pursuit of this strategy if the likely ultimate result of seeking these capabilities is the breakdown of the arms control process.

The U.S. Perspective on the Security Environment

Complexity defines the 21st-century international security environment. Nonstate actors have become both more visible and, with the diffusion of technology, more capable of challenging states’ monopoly on the use of massive force. The rise of the developing world and the subsequent push to challenge the status quo, unipolar system has also altered the security landscape. Many of these threats cannot be addressed with nuclear weapons. The collapse of the Soviet Union, an easing of tensions between the United States and its former adversary, and the reduced threat of a nuclear exchange further magnify the U.S. shift away from nuclear deterrence.

In his April 2009 Prague speech, President Obama declared that the gravest threats to U.S. national security, and the security of the international community, are the threats of nuclear proliferation and nuclear terrorism.² The Soviet Union could be deterred by the guarantee of a retaliatory capability and mutually assured destruction. Proliferators and terrorists seeking weapons of mass destruction (WMD) cannot necessarily be deterred by nuclear weapons. Rogue states such as Iran and North Korea are probably not arming themselves to respond to unconventional U.S. capabilities. More likely, both states are pursuing nuclear weapons in response to regional dynamics, and to counterbal-

2. Remarks by President Barack Obama, Hradcany Square, Prague, April 5, 2009, http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered.

ance conventional U.S. capabilities and the perceived willingness of the United States to exercise its power.

These drivers make it very difficult for the United States to influence a rogue state's decision to pursue and/or use nuclear weapons via nuclear deterrence; other tools like negotiations and sanctions would likely be more effective. Additionally, it is clear that terrorists cannot be deterred by nuclear weapons, due mainly to the lack of a retaliatory target for the United States and a willingness to die for their cause. All these aspects necessitate a much more complex strategy and diverse suite of military and diplomatic tools.

Guided by this threat analysis, the *U.S. National Security Strategy* and the *Quadrennial Defense Review Report (QDR)* stress the importance of securing nuclear materials worldwide, recommitting to Nuclear Non-Proliferation Treaty (NPT) Article VI obligations, and building the military capabilities suitable for responding to the range of threats posed by both state and nonstate groups.³ Building a consensus before acting, and pursuing a strong international order, are the cornerstone of U.S. military strategy. Maintaining access to the global commons, safeguarding U.S. and allied security interests, and sustaining the ability to project power abroad are also paramount. Furthermore, the United States actively seeks to reserve its capability to act when international norms are threatened and it is in its interest to intervene. This security concept is underscored in the *QDR*: "America's interests and role in the world require armed forces with unmatched capabilities and a willingness on the part of the nation to employ them in the defense of our interests and the common good."⁴ Achieving this objective requires a broad suite of unrivaled military capabilities.

Beyond Traditional Conventional Capabilities

Largely due to the diffusion of advanced weapons technologies, achieving this level of security and freedom of action requires not only traditional military capabilities but also potentially more sophisticated technologies like ballistic missile defense and conventional-tipped ballistic missiles. To be clear, the United States is not abandoning its nuclear capabilities; for as long as nuclear weapons exist, the United States will maintain a safe, secure, and effective nuclear weapons stockpile.

U.S. Ballistic Missile Defense

During the past decade in the United States and, more recently, in NATO, the perceived importance of ballistic missile defenses has seen a resurgence. North Korea has already tested two nuclear devices. U.S. intelligence estimates also indicate that Iran is "keeping open the option" to acquire a nuclear weapons capability. In addition, these estimates

3. White House, *U.S. National Security Strategy*, May 2010, http://www.whitehouse.gov/sites/default/files/rss_viewer/national_security_strategy.pdf; U.S. Department of Defense, *Quadrennial Defense Review Report*, February 2010, <http://www.defense.gov/qdr/QDR%20as%20of%2026JAN10%200700.pdf>.

4. U.S. Department of Defense, *Quadrennial Defense Review Report*, 9.

assess that both countries are pursuing missile technologies and therefore the means to deliver these weapons.⁵ Regional threats like Syria are also rising to the fore, and new challenges continue to arise. These threats, as well as technological advances in sensors, among other things, make ballistic missile defenses very attractive to policymakers and strategists.⁶ Effective missile defenses would potentially allow for limited defense of the homeland and provide a regional tool to protect allies and partners. In 2010, the Department of Defense released its *Ballistic Missile Defense Review Report (BMDR)*, which emphasized that such defenses were an “essential element” in assuring that the U.S. military has the freedom to maneuver and in supporting U.S. extended deterrence and reassurance commitments.⁷

The U.S. missile defense strategy outlines key priorities, including defense of the homeland against the threat of a limited long-range ballistic missile attack, defense against regional missile threats to U.S. forces and allies, and expanded international efforts and cooperation on missile defense. Regarding the first priority, defending the homeland, the *BMDR* notes that the current ground-based midcourse defense system—which includes 30 interceptors—is sufficient for protecting the United States against any plausible rogue state ballistic missile attack. To hedge against a potential new threat emerging, the United States will install a second field of 14 interceptor silos. Regional missile defenses that protect against short- and medium-range ballistic missiles are also a high priority. To protect against potential regional threats to Europe, the United States will deploy a modest, initially sea-based capability.

By expanding the procurement of already-proven area defense systems, investing in more capable interceptor technologies, and developing airborne infrared sensors, in the 2018 time frame the United States plans to have land-based interceptor systems in Northern and Southern Europe capable of defending against short- and intermediate-range missiles. In approximately 2020—and presumably in parallel with the evolution of potential threats—the United States plans to be able to deploy a regional, limited early-intercept capability against long-range missiles. The *BMDR* also emphasizes that flexibility is a key characteristic of the U.S. plan, specifically with regard to the ability to augment these defensive forces by relocating and expanding the number of assets. To that end, the Defense Department plans to augment the inventory and production capacities of its area defense and interceptor systems.⁸

The *BMDR* also underscores the administration’s commitment to international cooperation. The goal is for the NATO allies, Russia, China, and others to all work toward a shared cost burden and view of the threat. Both the *NPR* and the *BMDR* acknowledge

5. Dennis C. Blair, Statement for the Record, “Annual Threat Assessment of the US Intelligence Community for the Senate Select Committee on Intelligence,” February 2, 2010.

6. Scott D. Sagan, “Sagan Response to Waltz,” in *The Spread of Nuclear Weapons: A Debate Renewed*, edited by Scott D. Sagan and Kenneth N. Waltz (New York: W. W. Norton, 2003), 179.

7. U.S. Department of Defense, *Ballistic Missile Defense Review Report*, February 2010, http://www.defense.gov/bmdr/docs/BMDR%20as%20of%2026JAN10%200630_for%20web.pdf.

8. *Ibid.*, iii–vii, 19–21, 27.

that Russia and China have concerns and view missile defenses as destabilizing.⁹ To assuage these concerns, both reports advocate strategic dialogue with Russia and China. Cooperation with Russia is given particular attention because missile defense will likely be one of the key determinates in whether a follow-on agreement to New START can be negotiated. The *BMDR* encourages Russia to contribute to the missile defense system in Europe via its radar systems in Azerbaijan. Achieving this level of cooperation will require a common view of the threat environment, specifically the threat posed by the proliferation of ballistic missile technology.¹⁰ Since 2009, a joint U.S.-Russian Presidential Commission has been gathering to develop this common view and to develop an outline of what cooperation might look like. The working group slated to address missile defense cooperation and develop a common understanding of the ballistic missile threat has met 10 times over two years. The results have been mixed; high-level meetings are taking place, which is necessary if common ground is to be found, but no action plan has been put forth, only a statement that discussions will continue.¹¹

U.S. Conventional Prompt Global Strike

A U.S. conventional strike capability would be intended to provide an offensive tool for defeating an adversary across a number of scenarios where current conventional capabilities and/or nuclear assets would not be effective or credible. A recent report by the National Defense University identifies four scenarios in which the United States would benefit from possessing such a capability: “when terrorist leaders are located, WMD transfers are suspected, missile launches are imminent, and ‘high-value’ targets are identified in larger military campaigns.”¹² As a result, Defense Department officials have testified to Congress that the successful development and deployment of such a system would enhance U.S. deterrence and security by providing a capability to “engage distant, fleeting targets promptly” without using a nuclear weapon.¹³

Timeliness and relatively unlimited access are key characteristic of each concept for conventional strike currently in the design, development, and testing stages. Additionally, this concept does not necessarily require forward basing, and should be able to destroy targets around the globe in an hour or less.¹⁴ Precision will also be an essential attribute of this program. Although current ballistic missile technology used for nuclear warheads is quite accurate, the nuclear payload that is delivered mitigates the degree of accuracy required—conventional payloads will not have a similar room for

9. *Ibid.*, 12; U.S. Department of Defense, *Nuclear Posture Review Report*, 28.

10. U.S. Department of Defense, *Ballistic Missile Defense Review Report*, 34.

11. U.S. Department of State, “Joint Report: 2009–2010 Results of the Joint U.S.-Russian Presidential Commission,” June 24, 2010, <http://www.state.gov/documents/organization/143808.pdf>.

12. M. Elaine Bunn and Vincent A. Manzo, *Conventional Prompt Global Strike: Strategic Asset or Unusable Liability?* Strategic Forum 263 (Washington, D.C.: Institute for National Strategic Studies, National Defense University, 2011), 5.

13. Brian R. Green, “Testimony for the Senate Armed Services Committee Strategic Forces Subcommittee Hearing Regarding Global Strike Issues,” March 29, 2007, 2.

14. Amy F. Woolf, *Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues* (Washington, D.C.: Congressional Research Service, 2011), 2.

error. Therefore, the reentry vehicles and warheads used on existing ballistic missiles will need to be modified for this new mission. To provide the necessary accuracy, the reentry vehicle will need to be more maneuverable, potentially able to “glide” to the target while traveling at hypersonic speeds, and able to employ a unique guidance system capable of surviving in extreme temperatures and at high velocities.¹⁵ The difficulty of achieving the necessary level of precision is exacerbated in scenarios involving moving, hardened, and fleeting targets, so technology development efforts will need to address this challenge.

All three U.S. military services are working on separate conventional prompt global strike concepts. The Navy was working to modify a limited number of existing Trident ballistic missiles, removing the nuclear warhead and replacing it with a precision-guided conventional warhead.¹⁶ Congress halted funding for this program in 2008, however, given that this would be a relatively straightforward technology development option, but it is possible that the Defense Department could revive this program at some future date. Of the primary conventional strike programs Congress currently funds, the Air Force’s option is considered the most promising. This concept involves modifying Minuteman II and Peacekeeper missiles. These land-based ballistic missiles would be armed with a conventional warhead inside a reentry body that would be able maneuver to a target while traveling at hypersonic speeds.¹⁷ As a result, this system would not fly a traditional ballistic trajectory. Finally, the Army is working to develop an alternative hypersonic reentry body, with a shorter range than the other concepts, which would be deployed on a platform developed from a Navy Poseidon ballistic missile.¹⁸ All these concepts are yet to be proven and therefore do not have a set deployment date. However, the Defense Department is tentatively seeking to make a final program selection on the reentry body by about 2013.¹⁹

Weighing the Benefits

Both capabilities could potentially provide the United States with useful tools for defeating 21st-century threats. Missile defense can be perceived as a benign capability, providing a limited capability to deter, and if necessary defeat, an Iranian or North Korean ballistic missile salvo. Many allies also support the development of missile defense as a demonstration of U.S. commitment to their security.²⁰ The Defense Department has also committed itself to making sure that new missile defense capabilities are financially feasible and rigorously tested before deployment, thereby resolving key weaknesses of previous missile defense programs. Concepts like conventional strike have also gained support as providing a means to destroy time-sensitive targets in denied-access areas at global ranges.

15. Ronald Kerber and Robert Stein, “Report of the Defense Science Board Task Force on Time Critical Conventional Strike from Strategic Standoff,” Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, March 2009, 24–27.

16. Woolf, *Conventional Prompt Global Strike and Long-Range Ballistic Missiles*, 10–11.

17. *Ibid.*, 12–15.

18. *Ibid.*, 17.

19. *Ibid.*, 16.

20. U.S. Department of Defense, *Ballistic Missile Defense Review Report*, 12.

The main arguments in support of such a capability are credibility and timeliness. In many defense planning scenarios, striking a target with a nuclear weapon is not credible. A conventional-tipped missile would potentially provide a prompt, long-range strike capability that existing conventional forces lack. Conventional strike would also provide an option to defeat a target in the event that U.S. forces were not deployed nearby and were therefore unavailable to execute a time-sensitive mission.²¹ These characteristics indicate a potential utility for addressing the threats that the United States is most concerned about, namely rogue states and terrorists. Furthermore, both capabilities are viewed as an opportunity to advance the president's objective of reduced reliance on nuclear weapons and as a potential means to deter states from pursuing ballistic missiles and nuclear weapons in the first place. As a result, the United States protected these capabilities during the New START negotiations.

On the other side of the equation, the assertion that ballistic missile defense is a wholly benign capability is only partially accurate, because missile defenses also have an offensive flavor in that they can potentially allow for increased military access. As the *BMDR* notes, "Missile defenses also aid the United States in maintaining freedom of maneuver, by helping to negate the coercive potential of regional actors' intent on inhibiting and disrupting U.S. military access."²² Missile defenses allow for increased military access in a number of plausible scenarios, for example, in U.S. deployments in the Pacific. Reputed to be developing an antiship ballistic missile, China could take this option off the table.²³ With ballistic missile defense, the United States could buy down the risk to its forces deployed in the Pacific. These kinds of characteristics encourage suspicion regarding U.S. intentions, particularly as it moves to deploy increasingly capable missile defense systems during the next decade.

In the longer term, if further stockpile reductions—that is, to a stockpile in the hundreds—are made, such a system could also plausibly provide the United States with a credible means of negating the Russian second-strike capability and thus their deterrent. Even if the system does not in fact do that, and is even physically incapable of doing that, as Kenneth Waltz argues, it will be viewed as threatening and thus significantly complicate any future arms control agreements.²⁴ This threat could be mitigated to some degree if the Russians moved to more mobile systems. Russia, however, has traditionally preferred fixed, multiple independently targeted reentry vehicles (MIRVed), intercontinental ballistic missile (ICBM) systems as the backbone of its deterrent. Russia is currently investing hundreds of billions to develop a next-generation, fixed-silo ICBM. However, in a somewhat positive development, this system is intended to be capable of penetrating missile defenses.²⁵

21. Bunn and Manzo, *Conventional Prompt Global Strike*, 1–4.

22. U.S. Department of Defense, *Ballistic Missile Defense Review Report*, 12.

23. Bill Gertz, "Inside the Ring: PLA Missile Deception," *Interconnection World*, <http://www.interconnectionworld.com/index/display/wire-new-display/1456087379.html>.

24. Kenneth N. Waltz, "Waltz Responds to Sagan," in *Spread of Nuclear Weapons*, ed. Sagan and Waltz, 146–149.

25. NTI: Global Security Newswire, "Russia to Ready a New ICBM by 2013," <http://gsn.nti>.

With regard to conventional strike, the conundrum of such a system is that whereas it may potentially serve as a deterrent to proliferation, it will almost certainly spur adversaries to develop more sophisticated means to deny U.S. military access to the particular region. A recent National Defense University study notes a possible short-term result of the United States fielding conventional prompt global strike: “Rogue states may develop more advanced air defense and missile [defense] capabilities, and near-peer competitors will likely acquire improved anti-access capabilities.”²⁶ In the long term, if countries pursue these types of capabilities, it will certainly complicate the U.S. military’s freedom of maneuver and access to the global commons. As to the potential timeliness such a system would provide, a Defense Science Board study found the need for such a capability to be negligible, noting that “owing to the global basing of U.S. forces, intercontinental delivery is usually unnecessary.”²⁷ Also, the board found that given the amount of time it takes to identify and surveil a potential target, devise a strike plan, and make a decision, executing the strike is the least time consuming.

Furthermore, Special Forces teams would still likely be the preferred option, given their ability to be precise and limit collateral damage.²⁸ Underscoring this point, the recent operation against Osama bin Laden was an exact match for a potential scenario (when a terrorist leader is located) suited to the use of prompt strike. Granted, the president did not have a conventional strike option available to use, but it is not clear that this option would have been exercised, regardless. The Special Forces team that was sent in successfully completed the mission, and with boots on the ground the United States was able to confirm beyond a shadow of a doubt that the target had been rendered. Compared with the cost, the Defense Science Board ultimately found that deploying a system like conventional prompt global strike would not provide a lasting, “watershed capability” for the United States in addressing 21st-century threats.²⁹ There is also a concern that this capability has the potential to upset strategic stability if Russia or China were to be uncertain as to whether the incoming missile was tipped with an unconventional, rather than nuclear, warhead.³⁰ With a hypersonic glide reentry vehicle, the risk of that specific misinterpretation can be reduced. If the hypersonic glide technology is pursued, however, it introduces the potential for these countries to misinterpret the exact target of the strike, because the weapon would not be traveling on a predictable ballistic trajectory.

A Case Study: Russia

In crafting the current U.S. security strategy and defense posture, U.S. leaders have gone to great lengths to emphasize that ballistic missile defense and conventional strike

org/gsn/nw_20110318_6022.php.

26. Bunn and Manzo, *Conventional Prompt Global Strike*, 13.

27. Kerber and Stein, “Report of the Defense Science Board,” 3.

28. *Ibid.*

29. *Ibid.*, 4.

30. Bunn and Manzo, *Conventional Prompt Global Strike*, 14–17.

are only intended to provide a limited capability. The *NPR* explicitly acknowledges the concerns of Russia and China regarding strategic stability, and advocates dialogue with both countries in order to assuage their concerns.³¹ The purpose of this dialogue would be to reach a common understanding of the WMD terrorism and nuclear proliferation threat, with this common understanding eventually leading to stability and future nuclear reductions. Because the next round of arms control negotiations will most likely be a U.S.-Russian agreement, the next section examines Russia's general perception of its threat environment and the role of nuclear weapons in its national security strategy. In addition, this section assesses the potential impact that the development and deployment of ballistic missile defense and conventional global strike will have on Russia's view of the threat and consequently its willingness to pursue future nuclear arms reductions.

Russia's Threat Perception

Russia is still recovering from the collapse of the Soviet Union in 1989 and the Asian financial crisis of the mid-1990s. The Russian economy is roughly the size of California's, and yet its government must oversee 140 million citizens and a land mass almost twice as large as the United States.³² The Russian military is grossly inferior to the conventional capabilities of the United States and NATO. Although it is beginning to regain its footing to some degree, the pace of the effort to modernize Russia's military depends largely on the prices of commodities, namely oil, which are historically volatile. Maintaining its status quo capabilities will be an expensive proposition, and rebuilding will take more than two decades and tens of billions in investments.³³ In short, Russia's nuclear weapons and its seat on the United Nations Security Council are the last vestiges from its days as a superpower.

In addition to the economic disparity between the United States and Russia, their respective threat environments are also polar opposites. Rather than a friendly, or even benign, neighborhood, Russia is in a more hostile region with few natural allies. Its "sphere of influence" has shrunk, and many of its former allies and partners (e.g., the Warsaw Pact and Commonwealth of Independent States) have turned to the United States and NATO to seek protection from their former hegemon. For Russia, NATO remains an anti-Russia military alliance; Russia views the eastward expansion of NATO to include its historic rivals as only reinforcing this bias. As Ruslan Pukhov, director of the Moscow Centre for Analysis of Strategies and Technologies, argues, "the foreign policy of most Eastern European countries has been characterized by the aspiration to weaken Russia and its influence to the maximum."³⁴ The Conventional Forces in Europe Treaty also

31. U.S. Department of Defense, *Nuclear Posture Review Report*, 35.

32. U.S. Central Intelligence Agency "Russia," in *World Factbook*, <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2001rank.html?countryName=Russia&countryCode=rs®ionCode=cas&rank=7#rs>.

33. Marcel de Haas, "Russia's Military Doctrine Development (2000–10)," in *Russian Military Politics and Russia's 2010 Defense Doctrine*, edited by Stephen J. Blank (Carlisle, Pa.: Strategic Studies Institute, U.S Army War College, 2011), 25–27.

34. Ruslan Pukhov, "Russia-NATO Relations Dimension," December 9, 2008, <http://www.natomission.ru/en/society/article/society/artnews/22/>.

causes friction. Rather than a mechanism to balance the security interests of both sides, the treaty is increasingly viewed as a means to weaken Russia's military.³⁵

Furthermore, Russian policymakers have a "highly pessimistic worldview."³⁶ Their perception is that each state is looking to improve its standing and power, and that states will use whatever tools are available to them, both military and diplomatic, to achieve their desired end—exactly the strategy the United States employed during the Cold War.³⁷ Because military force is a legitimate means of achieving foreign policy objectives, as Dmitri Trenin notes, "[Russian policymakers] focus on states' military capabilities, rather than their political affiliations."³⁸ It follows, then, that the United States, with the world's largest military, whose capabilities underpin the NATO alliance along its border, would be seen as the principal threat to Russian security. Russia also feels threatened by other developments like Islamic fundamentalism, ethnic tensions in Chechnya and the North Caucasus, and the latent military potential of some of its neighbors. However, the 2009 Russian National Security Strategy specifically calls out the expansion of NATO, the U.S. global missile defense system, and the implementation of a global "lightning strike" nonnuclear capability as key threats to strategic stability that necessitate Russia "undertake all necessary efforts" to maintain parity with the United States.³⁹ Certainly, the successful conclusion and ratification of New START has laid the groundwork for an improvement in the relationship between the United States and Russia. This treaty did not "fix" the relationship, however, and finding enough common ground to move toward a follow-on agreement to New START will be challenging.

The Role of Nuclear Weapons in Russian Strategic Planning

Its lack of resources and weak conventional forces make avoidance of war an imperative for Russia; maintaining a robust strategic nuclear force provides the necessary deterrent. Since the end of the Cold War, the tables have turned, and it is Russia, rather than the United States and Europe, that requires a "great equalizer." Stephen Blank observes: "Moscow's reliance on nuclear weapons to compensate for a weakened conventional military has led it to emphasize nuclear weapons for the purposes of maintaining superpower status, deterrence and potential war fighting."⁴⁰ In response to the breadth of perceived threats, Russian military planners have solidified the already-entrenched role of nuclear weapons in their national security doctrine; nuclear forces have taken on a "hypertrophied" role in Russian military strategy.⁴¹ Thus, as the principal guarantor of

35. Ibid.

36. Dmitri Trenin, *Russia's Threat Perception and Strategic Posture* (Carlisle, Pa.: Strategic Studies Institute, U.S Army War College, 2007), 35–47.

37. Ibid, 35.

38. Ibid.

39. "National Security Strategy of the Russian Federation to 2020," May 12, 2009, no. 537.

40. Stephen J. Blank, "Prospects for Russo-American Cooperation in Halting Nuclear Proliferators," in *Prospects for U.S.-Russian Security Cooperation*, edited by Stephen J. Blank (Carlisle, Pa.: Strategic Studies Institute, U.S Army War College, 2009), 177.

41. Michael Bohm, "Opinion: A Case of False Missile Defense Panic," *Saint Petersburg Times*, June 8, 2011, http://www.sptimes.ru/index.php?action_id=100&stoty_id=34124.

Russia's security and prestige, the modernization of its nuclear forces has been heavily prioritized by its policymakers.

In addition to deterrence, nuclear weapons have an important political role for Moscow—they demonstrate that the country is still relevant. Daniel Goure notes that “in essence the current Russian leadership’s hold on power depends on its ability to demonstrate that they are restoring Russia to its rightful position in the world.”⁴² For the Russian elite, stockpile reductions are not completely off the table, but significant reductions seem unlikely because “the principal danger to Russian security, or more correctly to the security of its leadership’s hold on power, is in the absence of nuclear weapons.”⁴³ The Russian leadership has cultivated an exaggerated threat perception in part to validate its authoritarian tendencies. In the absence of nuclear weapons, not only would policymakers face considerable domestic pressure to address adverse secular, demographic, and socioeconomic trends but Russia would also lose its “special relationship” with the United States.⁴⁴ Thus, as Goure contends, “the idea that nuclear weapons can be rendered irrelevant or even eliminated entirely starkly contravenes Russian views of the role these devices play in their country’s security policy and domestic politics.”⁴⁵

Russia’s “Perception” of Ballistic Missile Defense

As rogue states have moved closer to developing nuclear weapons technologies and the ability to deliver them, the United States has felt increasingly threatened. Yet Russian policymakers simply do not perceive the same threats—they are more concerned with regional threats like Pakistan, a country actively increasing the size of its nuclear weapons stockpile. Russia does not see the immediacy of the Iranian threat in particular, citing the lack of an Iranian ballistic missile capability, the fact that Iran is several years away from having such a capability, and an assessment that there are no indicators that Iran’s nuclear program is intended for military use.⁴⁶

Furthermore, U.S. policy explicitly excludes the possibility of negotiating constraints on U.S. missile defense—a stance that Russian officials, most recently President Dmitry Medvedev, say reinforces the perception that such defenses are directed at Rus-

42. Daniel Goure, “Russian Strategic Nuclear Forces and Arms Control: Déjà Vu All Over Again,” in *Prospects for U.S.-Russian Security Cooperation*, ed. Blank, 311.

43. *Ibid.*, 314.

44. Goure, “Russian Strategic Nuclear Forces,” 313–315; Dmitri Trenin, *Russia’s Nuclear Policy in the 21st Century Environment*, Proliferation Papers (Paris: Security Studies Department, Institut Francais des Relations Internationales, 2005), http://www.ifri.org/files/Securite_defense/prolif_12_Trenin.pdf.

45. Goure, “Russian Strategic Nuclear Forces,” 315–316.

46. Stephan Blank, “Eastern European Missile Defense: Russia’s Threat Assessment and Iran,” Strategic Studies Institute, U.S. Army War College, July 13, 2011, <http://www.criticalthreats.org/russia/eastern-european-missile-defense-russias-threat-assessment-and-iran>; Blog Dmitry Gorenburg, “Valdai Club 6: Missile Defense,” June 8, 2011, <http://valdaiclub.com/blogs/26640.html>.

sia.⁴⁷ Therefore, at least according to Russian rhetoric, Russians can only interpret U.S. action on missile defense as being directed against them or providing a capability that can be used against them in the future. As Trenin observes, “U.S. plans to construct ballistic missile sites in Central Europe are deemed to be a part of a global plan to achieve strategic superiority over Russia: Iran, Russians maintain, is only camouflage.”⁴⁸

Of course, all the statements being made by Russian officials may very well be only bluster, and an effort to better position Russia in advance of the next round of negotiations on nuclear reductions. After all, as some Russian commentators have noted, there are numerous, objective reasons why U.S. plans on missile defense pose no threat to Russia, the least of which is that current interceptors are incapable of reaching Russia’s land-based and sea-based strategic systems.⁴⁹ To credibly threaten Russia’s strategic deterrent forces, not only would interceptors need to be positioned in places like Canada, rather than Southern Europe, but thousands rather than tens of interceptors would need to be deployed.

Given these facts, the position that many of Russia’s military and political elite have taken seems irrational. However, because many in Russia’s military elite see the strategic deterrent as the principal guarantor of Russian security and relevance, as Michael Bohm notes, “even the slightest hint of a theoretical devaluation of Russia’s strategic forces from U.S. missile defenses gets blown out of proportion and is viewed as life and death for the country’s national security.”⁵⁰ In response to this perceived threat, however groundless, Russia is already making threats that will complicate efforts to reach an agreement on future stockpile reductions. Specifically, experts point to the numerous Russian officials who have “gone so far as to warn that Moscow will take offensive countermeasures, some of which would increase the threat to Europe, in the event that [missile defense] deployments go forward.”⁵¹

Russia’s “Perception” of Conventional Precision Strike Capabilities

The role of U.S. conventional capabilities in entrenching Russia’s reliance on nuclear weapons also deserves examination. Upon completion of development and testing, conventional strike is intended to provide the United States with the capability to deliver these strikes anywhere in the world in approximately an hour. In the section above, this paper argues that, at a minimum, missile defense has driven Russia to solidify the role

47. U.S. Department of Defense, *Nuclear Posture Review Report*, 35; Henry Meyer and Lyubov Pronina, “Medvedev Says Not Happy With U.S. Missile Defense Response,” *Bloomberg Businessweek*, May 27, 2011, <http://www.businessweek.com/news/2011-05-27/medvedev-says-not-happy-with-u-s-missile-defense-response.html>.

48. Trenin, *Russia’s Threat Perception*, 40. Also see Bernard Gwertzman, interviewer and consulting editor, “The U.S.-Russia Missile Defense Impasse” (interview with Stephen Sestanovich), June 1, 2011, http://www.cfr.org/missile-defense/us-russia-missile-defense-impasse/p25169?cid=rss-analysisbriefbackgroundersexp-the_u.s._russia_missile_defens-060111.

49. Bohm, “Opinion.”

50. Ibid.

51. Goure, “Russian Strategic Nuclear Forces,” 322.

of nuclear weapons in its security strategy. Though certainly not to the same degree as missile defense, conventional prompt global strike is also clearly on Russia's radar as a potentially significant threat. Furthermore, the Russian National Security Strategy indicates that one of the roles of its nuclear deterrent will be to deter a potential U.S. attack using these global "lightning strike" weapons.⁵²

According to Russian political and military leaders, conventional-tipped missiles are viewed as a threat to strategic stability. From the Russian perspective, such a conventional system could potentially be worse than a nuclear weapon. For example, the United States could potentially strike Russian ICBMs using a prompt global strike capability, and Russia's ability to respond would be complicated by the fact that the attack was not technically nuclear. Although this may seem a stretch to U.S. planners given the proposed size of conventional strike deployments—a couple tens rather than thousands—Russian strategists clearly think this is a possibility. As Goure observes, "Most Russian sources see such weapons, with their extreme precision, as a means of circumventing strategic arms control as well as potentially an attempt to develop a new strategic weapon for use against Russia that would slide under any theoretical nuclear use threshold."⁵³

In response, Russia has reiterated the importance of its nuclear deterrent to its national security. This development is worrisome, given that Russia's posturing and rhetoric could potentially lead to an arms race, particularly if Russia continues on its current track, developing next generation MIRVed, fixed ICBMs rather than mobile ICBM systems. Although an arms race is a remote possibility, especially given that the United States would have to respond in kind, Russia's rhetoric does not bode well for future nuclear reductions.

The Validity of Russia's Concerns

Prioritizing missile defenses and prompt global strike has caused Russia to entrench its already-heavy reliance on nuclear weapons. As Les Aspin once noted, "a world without nuclear weapons would not be disadvantageous to the United States. In fact, a world without nuclear weapons would actually be better. Nuclear weapons are still the big equalizer, but now the United States is not the equalizer but the equalizee."⁵⁴ Conventional prompt global strike, ballistic missile defense, and the traditional suite of U.S. conventional capabilities provide the United States with an unprecedented force projection capability. This fact undoubtedly makes the United States feel less threatened by the international security environment because it provides flexibility to maneuver. But, of course, there are consequences. In countries like Russia, where U.S. capabilities are, at a minimum, looked upon warily, stockpile reductions, prompt global strike, missile defense, and the like are seen as "potentially making the world safe for American military intervention whenever we want," driving states that perceive an adversarial relationship

52. "National Security Strategy of the Russian Federation to 2020."

53. Goure, "Russian Strategic Nuclear Forces," 320.

54. Les Aspin, "Three Propositions for a New Era Nuclear Policy," commencement address, Massachusetts Institute of Technology, June 1, 1992, 2, <http://web.mit.edu/newsoffice/tt/1992/june03/26094/html>.

with the United States to increase their reliance on nuclear capabilities to counterbalance U.S. conventional capabilities.⁵⁵

On the basis of current deployment plans and policies, both systems would provide only a limited, niche capability. The United States has stated that it will not—and in fact cannot—hold at risk the Russian deterrent with missile defense and prompt global strike. However, states will have to assume that each system will perform better than expected and arm themselves accordingly.⁵⁶ Perhaps more important, from the Russian perspective, there is nothing obligating the United States to its current deployment plan, given that neither missile defense nor prompt global strike—if hypersonic glide is pursued—is presently limited by arms control commitments. Thus, though current plans may not be threatening, the precedent these plans set, and the potential that these plans and policies will be altered in the future to put in place more formidable defense and strike capabilities, is perceived to be very threatening. Regarding missile defense in particular, the Russian perception is that, once in place, the system “could provide an excellent base for a more elaborate system that could indeed neutralize Russia as a nuclear power.”⁵⁷ For Russia, because nuclear weapons are viewed as the ultimate guarantor of its security, such a development is unacceptable. Therefore, every effort must be made now to stop future developments on missile defenses and conventional strike so that Russia can remove these potential long-term threats to its deterrent.

Russia’s concerns may be completely exaggerated. U.S. plans for conventional strike and missile defense may just be a convenient platform to demonstrate that Russia is still relevant in international politics. However, Russia is slowly backing itself into a corner, and may decide that it needs to make good on its threats to increase its arsenal of strategic nuclear systems in order to regain strategic parity with the United States. More worrisome is the potential that Russia may begin to believe its own rhetoric; if the members of Russia’s political or military leadership calculated that striking first, rather than waiting and potentially losing their retaliatory capability, as behooved Russia, it would be very destabilizing. For these reasons, and to the degree that Russia’s leadership has emphasized the U.S. military capabilities as a principal threat to Russian security, strategic stability could be weakened by an unconstrained U.S. pursuit of missile defense and conventional strike.

Unblocking the Path Forward

The ratification of New START provided an essential opportunity to change the threat perception between the United States and Russia and make progress toward revitalizing the nonproliferation agenda. New START also provides a platform for launching a new round of negotiations on nuclear reductions. However, unless the United States can con-

55. Peter Baker, “With Arms Pact, Disarmament Challenge Remains,” *New York Times*, April 7, 2010, <http://nytimes.com/2010/04/08/world/europe/08arms.html>.

56. Waltz, “Waltz Responds to Sagan,” 148.

57. Richard Lourie, “Resets and Reruns,” *Moscow Times*, June 6, 2011, <http://www.tmt-index.com/opinion/article/resets-and-reruns/438233.html>.

vince Russia's political-military elite that its suite of conventional capabilities does not pose a threat to Russia and its second-strike capability, Russia will continue to heavily rely on its nuclear deterrent, and will likely be unwilling to negotiate with the United States on further stockpile reductions. A large part of this effort will be changing the perception in Moscow that Russia is viewed in an adversarial light along with the rogue states Iran and North Korea.⁵⁸

Beyond altering this threat perception, the United States will need to be prudent in the conventional capabilities it pursues. The political reality is that it would be almost impossible to negotiate on current plans for missile defense and a conventional ballistic missile capability. So what should be done? Many scholars have noted that the only viable path to missile defense that does not drive Russia to improve the size and capabilities of its strategic nuclear forces is a cooperative defense system.⁵⁹ Cooperation on missile defense is also central to any true "reset" of U.S.-Russian relations. Trenin recently opined that nothing less than the "nature of military-political relations between Russia, the United States, and NATO for the foreseeable future" depended on political decisions on missile defense.⁶⁰ The *NPR* and *BMDR* correctly emphasize the importance of establishing a cooperative relationship with Russia on missile defense. Before pursuing any of the land-based components of the European missile defense plan, every effort should be made to bring Russia into the fold, specifically by convincing the Russian leadership that the country will be more secure for having participated in missile defense.

Additionally, even though Russian rhetoric exaggerates the threat posed by missile defense, the United States should consider placing short-term constraints on its defenses, perhaps via an agreed-upon interceptor speed ceiling that would be reviewed as the ballistic missile threat from states like North Korea and Iran evolves. Regarding prompt global strike, the value of such a system is less clear than for missile defense. The United States should consider using this system as a bargaining chip in future negotiations on nuclear reductions. Specifically, the United States should consider whether it would be willing to trade conventional strike for significant reductions in Russia's nonstrategic nuclear arsenal.

Increasing the opportunities for information sharing and mutual transparency will also be critical. For example, in the late 1990s, promising transparency and confidence-building efforts like the Joint Data Exchange Center (JDEC) were pursued; but due to a lack of political will, they have for the most part been abandoned.⁶¹ Efforts like JDEC should be revived and fast-tracked. A regular exchange of launch notifications would certainly contribute to lessening the tensions between the United States and Russia, and

58. Trenin, *Russia's Threat Perception*, 38.

59. Goure, "Russian Strategic Nuclear Forces," 322. Blank, "Prospects for Russo-American Cooperation," 258; Gwertzman, "U.S.-Russia Missile Defense Impasse."

60. Dmitri Trenin, "After New START," *INOSMI*, December 23, 2010, <http://carnegieendowment.org/publications/?fa=view&id=42187>.

61. Christopher Ford, "Playing for Time on the Edge of the Apocalypse: Maximizing Decision Time for Nuclear Leaders," paper presented to Conference on Nuclear Deterrence: Its Past and Future, Hoover Institution, Washington, November 11, 2010, 25–26.

would have the added advantage of reducing the potential for a false alarm due to a misinterpretation of early-warning data.⁶² Another program that should be revived is that of the joint live-fire exercises that were canceled in the wake of the Georgian conflict. Over the long term, the United States must prioritize initiatives like JDEC, joint live-fire exercises, and cooperative missile defenses. All these avenues must be pursued in order to address Russians' genuine concerns that the evolution of U.S. conventional capabilities will undermine the survivability of their forces, which will ultimately lead to strategic instability.

Conclusion

The president's *National Security Strategy*, and the *Quadrennial Defense Review*, *Ballistic Missile Defense Review*, and *Nuclear Posture Review* all made it clear that the greatest threats to U.S. national security are nuclear weapons proliferation and WMD terrorism. In the face of these dangers, and because nuclear weapons have a diminished utility for combating rogue states and nonstate actors, the United States is pursuing niche conventional capabilities like missile defense and conventional prompt global strike. Ostensibly, this tack could work in enabling stockpile reductions; unfortunately, Russia's threat perception has not changed—and in fact its leadership has an interest in perpetuating the exaggerated U.S./NATO threat. Even if this perception does change, however, Russia is not in a position to take the same approach as it will struggle to fund a move toward more robust, more expensive, conventional forces.

Russia will ultimately need to depend ever more heavily upon its nuclear deterrent; but this complete reliance will only exacerbate its paranoia that U.S. missile defenses and conventional strike threaten its strategic forces. Russia has a window of opportunity to influence U.S. plans for these two conventional systems—a future nuclear weapons reduction treaty. Less a willingness on the part of the United States to negotiate constraints on either system Russian rhetoric or possible game of brinkmanship could unwittingly backfire, potentially resulting in a new arms race, at least on the Russian side. If the United States pursues ballistic missile defense and conventional prompt global strike in the current planned forms, avoiding this potential scenario will require a delicate balancing act. Given the current state of Russia's economy, threat perception, and domestic drivers, U.S. policymakers must recognize that this balancing act, and therefore any future efforts at further nuclear stockpile reductions, may have already been compromised. If stockpile reductions are the ultimate goal, the United States may need to reassess whether, and/or how, to pursue missile defense and conventional strike.

62. *Ibid.*, 26.

Reforming the Governance and Congressional Oversight of the National Nuclear Security Administration

Michael A. Clauser

Congress established the National Nuclear Security Administration (NNSA) as a semi-autonomous agency to bring renewed focus to the management and security of the U.S. nuclear weapons complex following a string of well-documented failures by the Department of Energy in the 1980s and 1990s. Yet more than a decade since its establishment, the NNSA has yet to achieve the semiautonomy envisioned by its founders. Today there is renewed interest in further reforming the NNSA's governance structure as well as its relationship with Congress. A bipartisan congressional commission identified two governance reform options and also urged reforming the NNSA's appropriations process. But these recommendations have been ignored by the Obama administration. The NNSA's two major obstacles, governance structure and insufficient funding, must be addressed by Congress to enable the organization's transformation from a Cold War legacy into a nimble, dynamic institution within America's national security architecture.

Overview

Congress created the National Nuclear Security Administration (NNSA) in 1999 as a separately-organized agency within the Department of Energy (DoE) through the National Nuclear Security Administration Act of 2000, a provision in Title XXXII of the National Defense Authorization Act (NDAA) for the same fiscal year. The act was the culmination of the bipartisan, bicameral efforts of the House of Representatives' Armed Services Committee's (HASC) Special Panel on Department of Energy Reorganization, working in conjunction with the chair of the Senate Appropriations Subcommittee on Energy and Water Development, Senator Pete Domenici (R-N.M.).¹

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1. The roster included Republicans, Chairman Mac Thornberry (Tex.), Duncan Hunter (Calif.), Lindsey Graham (S.C.), Jim Gibbons (Nev.), Jim Ryun (Kan.), and Floyd Spence (S.C.); and Democrats, ranking member Ellen O. Tauscher (Calif.), Norman Sisisky (Va.), John Spratt (S.C.), and Ike Skelton (Mo.).

Congress established the HASC Special Panel in response to allegations of security failings rooted in the mismanagement of nuclear weapons by the DoE. In reality, congressional interest in reforming the DoE’s management of America’s nuclear weapons stockpile existed before the well-documented security gaps of the 1980s and 1990s. However, it was this series of publicized security shortcomings, and not a Washington battle over esoteric bureaucratic wire diagrams, that garnered the political traction necessary to achieve a significant reorganization through legislation. The coup de grâce was a June 1999 report from the President’s Foreign Intelligence Advisory Board, which found that “the Department of Energy is a dysfunctional bureaucracy that has proven it is incapable of reforming itself.”²

Autonomy of management remains a persistent NNSA challenge. But current funding shortfalls that hurt weapons programs, human capital retention, and infrastructure maintenance have replaced security as the primary concern from a decade ago. Spending taxpayer dollars to maintain the nuclear weapons stockpile—along with the human and physical infrastructure supporting it—does not command the political interest and budget prioritization it did during the Cold War. An inappropriate congressional appropriations jurisdiction also leaves the NNSA shortchanged.³

Both executive branch and congressional panels agree that the NNSA has not achieved the level of semiautonomy from the DoE envisioned by its founders and that its mission is hindered by the current structure of congressional appropriations oversight. These panels have made various proposals for governance and oversight reform, several of which would strengthen the NNSA’s independence as an agency, clarify its relevance to post–Cold War U.S. national security, and change the appropriating subcommittee of jurisdiction in the House and Senate. But the path to reforming the NNSA begins with understanding the organization’s past and the catalysts that led to its establishment by Congress.

Management

One of the underlying concerns addressed by the National Nuclear Security Administration Act was the lack of clear lines of authority, oversight, and accountability of the nuclear weapons complex by the DoE.⁴ This was identified as the root cause for the security lapses. With the Cold War over, the nuclear weapons complex shrunk. The DoE decommissioned more than half the complex’s production sites. However, the DoE found it politically more difficult to reduce the administrative staffs resident across 11

2. “Science at Its Best, Security at Its Worst: A Report on Security Problems at the U.S. Department of Energy,” President’s Foreign Intelligence Advisory Board, June 1999, [http://cryptome.org/pfiab-Department of Energy.htm](http://cryptome.org/pfiab-Department%20of%20Energy.htm).

3. This point is expanded upon in the section titled “Congressional Oversight of the National Nuclear Security Administration.”

4. The nuclear weapons complex refers to the Pantex Plant, Y-12 Nuclear Security Complex, Kansas City Plant, Savannah River Site, Los Alamos National Laboratory, Lawrence Livermore National Laboratory, Sandia National Laboratories, and the Nevada Test Site.

field offices, which acted as middle-management shortstops between the weapons sites and labs and Washington. With fewer weapons sites to manage and administer, these regional hubs were left defending their size, mission, authority, and budget. Congressional communication with weapons labs and sites in their districts conflicted with the intermediary role of these middle managers. The result was one of the first pieces of legislation to reform the DoE's governance of the nuclear weapons stockpile.⁵

Section 3140 of the fiscal year (FY) 1997 NDAA limited the authority of both the secretary of energy and his assistant secretary of energy for defense programs to delegate authority to operate nuclear weapons production and laboratory facilities to the onsite DoE leadership at the production facilities and laboratories only. Reciprocally, the site offices were required to report directly to the assistant secretary, ensuring a clear line of communication, authority, and responsibility. This system cuts the regional hubs out of the picture. In addition, the same section of the FY 1997 NDAA required the secretary of energy to develop a plan for the reorganization of defense programs within the DoE. The provision established a Defense Program Management Council to be composed of the leadership of the nuclear weapons complex's laboratories, test site, and production sites to advise the assistant secretary on "policy matters, operational concerns, strategic planning, and development of priorities."⁶

This first reorganization legislation was short-lived—in effect for just seven days to be exact. The Energy and Water Development Appropriations Act for Fiscal Year 1997, signed a week after the FY 1997 NDAA, effectively repealed the authorization to reform lines of authority and establish the Defense Program Management Council by prohibiting any appropriations for its implementation. However, the Energy and Water Development Appropriations Act retained the requirement for the secretary of energy to transmit a plan to reorganize field activities.⁷ The successful effort to block this first attempt at reform by the House of Representatives was led by Senator Domenici, perhaps *the* foremost champion of the nuclear weapons complex in Congress. Domenici's actions surprised interested House members and sparked an inter-chamber dialogue that revealed an interest by the senator to address the issue of reorganization in a more systematic and holistic fashion—which in part meant including him.⁸

5. Then–freshman representative Mac Thornberry (R-Tex.), who represents the district that includes the Pantex Plant in Amarillo, first noted the interference of the regional offices and offered the first reform legislation.

6. National Defense Authorization Act for Fiscal Year 1997, "Sec. 3140. Management Structure for Nuclear Weapons Production Facilities and Nuclear Weapons Laboratories," PL 104-201, September 23, 1996, <http://www.gpo.gov/fdsys/pkg/PLAW-104publ201/pdf/PLAW-104publ201.pdf>.

7. "Sec 302: General Provisions," Energy and Water Development Appropriations Act, 1997, PL 104-206, September 30, 1996, <http://www.gpo.gov/fdsys/pkg/PLAW-104publ206/pdf/PLAW-104publ206.pdf>.

8. Mac Thornberry, "NNSA Tenth Anniversary Celebration," YouTube, April 28, 2010, <http://www.youtube.com/watch?v=f9RONfl8NG8>.

Security

A series of high-profile security issues at the nuclear weapons labs provided the political traction necessary to galvanize interest in revisiting DoE reform. Perhaps the most public example involves Wen Ho Lee, a Taiwan-born naturalized U.S. citizen and employee of Los Alamos National Laboratories. Accused of passing classified information to the People's Republic of China, he was indicted in December 1999 by a Grand Jury on espionage charges.⁹

Chaired by Representative Christopher Cox (R-Calif.), the Select Committee on U.S. National Security and Military/Commercial Concerns with the People's Republic of China was established in law in June 1998. The Cox Commission was chartered to explore China's access to U.S. restricted information including designs of U.S. nuclear weapons, missile defenses, national security satellites, and high-performance computers. Although many of the findings of the Cox Report were controversial politically, many of its recommendations for enhanced oversight and reform enjoyed broad support. One such recommendation suggested removing authority of the nuclear weapons stockpile from the DoE.

In March 1999, President Bill Clinton tasked the President's Foreign Intelligence Advisory Board (PFIAB) to examine security vulnerabilities across the DoE. The PFIAB formed a Special Investigative Panel led by former senator Warren Rudman and issued its findings in June of that year. The report's language was as aggressive as it was clear. It concluded that "organizational disarray, managerial neglect, and a culture of arrogance—both at DoE headquarters and the labs themselves—conspired to create an espionage scandal waiting to happen."

Despite belated efforts by then-secretary of energy Bill Richardson to address these management and security shortfalls, the PFIAB remained "extremely skeptical" that any reform from within would "gain more than a toehold."¹⁰ These indictments, first by a bipartisan congressional panel and second by the president's own PFIAB, left little doubt to congressional overseers that meaningful internal reform was unlikely. As a result, the HASC formed a special panel. After a year of hearings, both chambers passed the National Nuclear Security Administration Act of 2000 as a rider to the FY 2000 NDAA. President Clinton signed the bill into law in 1999. However, passing a law and implementing it are two very different things.

Implementation

Congress established the NNSA as a "separately organized agency" with the intent for it to be a "semiautonomous agency" focused on the peculiar work of nuclear security and insulated from other DoE mandates and priorities. This structure was designed to enable the NNSA to determine its own policy and budget priorities, independently hire

9. The original indictment of Lee never resulted in a conviction. Lee pled guilty to the lesser charge of mishandling restricted government data.

10. "Science at Its Best."

personnel, enter into contracts, provide legal counsel to its leadership, acquire products and services, set guidelines for safety and security at site offices—and to do this without relying upon outside labor power, funding, and policies from its parent organization.

By most accounts, however, achieving autonomy has been problematic since the NNSA's establishment. In a report reflecting upon the year following enactment of the National Nuclear Security Administration Act, the HASC Special Panel outlined its concern that the DoE was preventing the NNSA's autonomy.¹¹ They accused the DoE of “dual-hatting” existing Department personnel as NNSA personnel, thereby robbing the NNSA of any action or prerogative independent of the DoE. The Government Accountability Office noted similar obstacles.¹² Indeed, the extent to which the NNSA ever achieved the degree of autonomy envisioned by its founders is subject to debate. Speaking at the NNSA's 10-year anniversary, former HASC Special Panel chair, Representative Thornberry (R-Tex.) remarked,

So how's it gone these past ten years? I've got to confess, more than once, I think we chose the wrong path. I think, often, that we should have made [NNSA] a completely autonomous agency. Because the tentacles of the Department of Energy reaching in trying to take some of the money, to exercise some of the oversight keeps coming around. It's an issue that's come up over a variety of ways up over the years. I'm not sure we got that right.¹³

Thornberry's remarks echo the concerns raised by his Special Panel's implementation report and the Government Accountability Office a decade earlier: that the DoE remains loath to cede control and oversight of the NNSA. Why does the DoE habitually act in a manner found to raise costs and inhibit mission success by the NNSA? What provides the motivation for several DoE secretaries from both political parties to overreach into the NNSA?

The Department of Energy and the National Nuclear Security Administration

The peculiarity of the NNSA's nuclear weapons work on behalf of the military fundamentally differentiates it from the other missions of the DOE, which was created in the midst of an energy crisis during the Jimmy Carter administration.¹⁴ Of the 19 paragraphs

11. “Establishing the NNSA: A Year of Obstacles and Opportunities,” Special Oversight Panel of Department of Energy Reorganization, Committee on Armed Services, U.S. House of Representatives, October 13, 2000, <http://www.hsdl.org/?view&did=440076>.

12. Testimony of Associate Director of GAO, “Views on Department of Energy's Plan to Establish the NNSA,” Delivered to the Special Oversight Panel on Department of Energy Reorganization, Washington, March 2, 2000, 1, 2.

13. Thornberry, “NNSA Tenth Anniversary Celebration.”

14. “The driving motivation for the formation of the Department of Energy in 1977 and its predecessors—the Petroleum Board in 1972 and the Energy Research and Development Administration in 1974—was dealing with the energy crisis.” “Report of the Defense Science Board Task Force on Nuclear Capabilities,” Washington, December 2006, <http://www.acq.osd>.

in U.S. Code outlining the congressionally identified purpose of the DoE—there is just passing reference to nuclear weapons.¹⁵ Yet the majority of the DoE’s budget request is allocated for the NNSA.

The DoE’s budget request for FY 2012 was \$29.5 billion, of which \$11.8 billion was earmarked for the NNSA. Taken with the \$6.1 billion allocated for environmental management, or cleanup of decommissioned NNSA sites (related to, but administered outside, the NNSA by the DoE), the funding related to the nuclear weapons complex stands at well over half the DoE’s total. The DoE is left implementing the other 18 paragraphs of congressional mandates with a budget halved after implementing just one. And with the Office of Management and Budget setting top-line spending limits department by department, the DoE has an incentive to squeeze its 19.9 billion pound “elephant in the room” to free up funds for its other mandates (table 1).

Table 1. Fiscal Year 2012 Top-Line Budgets of Selected U.S. Cabinet Departments

Department	Budget (billions of dollars)
Agriculture	24
Defense	575
Education	77
Energy	29
Energy, less two agencies ^a	11.6
Homeland Security	43
Housing and Urban Development	48
State, and related agencies	47

^aLess *National Nuclear Security Administration and Environmental Management*.

Source: The President’s Budget Request for Fiscal Year 2012 (Washington, D.C.: White House, 2011).

Therefore, budget notwithstanding, the central concern for a DoE without the NNSA and environmental management is existential. Without a nuclear weapons mission, the size and budget of the DoE are not comparable to other top Cabinet-level departments; and this is an especially sensitive point for a Cabinet-level department that traces its first origins to the Manhattan Project. Separating the NNSA from the DoE could turn the rest of the DoE into a target for conservative lawmakers who, since the enactment of the Department of Energy Organization Act of 1977, have introduced legislation to weaken, merge, or disestablish the nonnuclear functions of the DoE. Considered in this political light, the motivation for the DoE leadership to maintain an “unnecessary,” “obtrusive,” and “heavy-handed” role in the governance and budgeting of the NNSA is better understood.¹⁶

[mil/dsb/reports/ADA459527.pdf](http://www.doe.gov/mil/dsb/reports/ADA459527.pdf).

15. Title 42, U.S. Code, Chapter 84, Section 7112, “Congressional Declaration of Purpose,” http://www.law.cornell.edu/uscode/42/uscode_42_00007112----000-.html.

16. William J. Perry, James R. Schlesinger, et al., *America’s Strategic Posture: The Final*

Another Commission

In 2007, lawmakers included language into the FY 2008 NDAA to establish a bipartisan Congressional Commission on the Strategic Posture of the United States.¹⁷ Chaired by former secretaries of defense William J. Perry (D) and James R. Schlesinger (R), the panel was tasked with examining everything from force structure to nuclear infrastructure and from missile defense to nonproliferation. Their final report was issued in June 2009.

In the chapter examining NNSA governance, the Perry-Schlesinger Commission cited three studies each demonstrating that DoE regulations raised costs and inhibited mission success within the NNSA.¹⁸ The panel's findings established that the dysfunctional relationship between the DoE and the NNSA was neither a neonatal aberration confined to the year following the NNSA's creation nor the parochial perception of its congressional champions. They agreed that "the governance structure of the NNSA is not delivering the needed results. Despite some success, the NNSA has failed to meet the hopes of its founders. It lacks needed autonomy. This structure should be changed." The clarity, resolve, and tone of the commission's findings mirrored the same in the PFIAB report a decade earlier.

Evaluating Proposals for Reform

The Perry-Schlesinger Commission's indictment of the NNSA's current governance structure was coupled with a review of five options for reform:

1. Strengthen the NNSA within the DoE through legislation.
2. Make the NNSA a defense agency.
3. Transfer the production complex to the Department of Defense while retaining the weapons laboratories and the Nevada Test Site within the NNSA.
4. Establish the NNSA as an independent agency reporting to the president through the secretary of energy.
5. Establish the NNSA as an independent agency reporting to the president with a "Board of Directors" composed of the secretaries of energy, defense, state, and homeland security plus the director of national intelligence.¹⁹

Report of the Congressional Commission on the Strategic Posture of the United States, Authorized Edition (Washington, D.C.: U.S. Institute of Peace, 2009), 56, http://media.usip.org/reports/strat_posture_report.pdf.

17. "Sec. 1062, Congressional Commission on the Strategic Posture of the United States," National Defense Authorization Act for Fiscal Year 2008, PL 110-181.

18. These included a Defense Science Board report, an external consultancy's report, and the findings from a pilot program that streamlined outside regulations. Perry, Schlesinger, et al., *America's Strategic Posture*, 56.

19. *Ibid.*, 57–58.

Option 1: Strengthen the NNSA within Department of Energy through Legislation

The commission dismissed the first recommendation out of hand and expressed pessimism about proposals two and three, citing interest by Department of Defense (DoD) leadership in the nuclear weapons complex as “at best, episodic.” The fifth option, while found to be “most appealing” to the commission was deemed not “politically practicable.” This resigned the group to the fourth option of refounding the NNSA as a wholly independent agency reporting to the president through the secretary of energy.

To return to the first option, it is hard to imagine how legislation could have increased the independence of the NNSA while simultaneously maintaining the agency within the DoE. The National Nuclear Security Act, as amended, ties the NNSA to the DoE only by dual-hatting the NNSA administrator as an undersecretary of energy for nuclear security.²⁰ And yet the habitual intrusion on NNSA affairs by the DoE is well documented. Congress could require that the NNSA prepare and submit a budget request to Congress independent of the DoE. It could prohibit the DoE from issuing regulations applicable to the NNSA; provide the NNSA with funding for a separate headquarters; and increase the NNSA’s budget for headquarters staff to assume the work of Energy Department personnel currently augmenting NNSA labor power. But if Congress goes this far, why not just make the NNSA fully independent? Therefore, the commission’s dismissal of this first proposal was warranted.

Option 2: Make the NNSA a Defense Agency

The commission’s second recommendation—making the NNSA a defense agency—in many respects calls a spade a spade. A 2006 Defense Science Board task force report on nuclear capabilities found that

in terms of competencies, commitment, and congruence of goals and management approaches, the DoD could be a better match for oversight and support of NNSA. National defense is a common goal. The DoD—its agencies and contractors—engage competently in R&D, quantity production, weapons integration with delivery systems, and many other aspects of nuclear weapons operations that underwrite deterrence.

Take, for example, the Missile Defense Agency (MDA).²¹ The MDA is a research, development, and acquisition agency within the DoD.²² Similarly, the NNSA constitutes a research, development, and acquisition agency for weapons used by the DoD—albeit within the DoE. At approximately \$8 billion, MDA’s budget is comparable to that of the NNSA. It is also no less the case that the DoD’s interest in missile defense is “at best, episodic.” Why did the commission reject this proposal?

20. The notable exception is that DoE and NNSA intelligence offices are merged by legislation.

21. In 1999, the PFIAB undertook a similar thought experiment, comparing NNSA with the National Reconnaissance Organization. See “Science at Its Best.”

22. “About Us,” Missile Defense Agency, <http://www.mda.mil/about/about.html>.

One reason is that nuclear weapons have long been considered “the president’s weapon.”²³ Given their massive destructive capacity, command authority for nuclear weapons has always rested in the civilian hands of the Oval Office. Likewise, oversight of their development and testing has also long resided under civilian control.²⁴ Compelling arguments have been made that legislation such as the National Security Act of 1947, the Goldwater-Nichols Act Department of Defense Reorganization Act of 1986, and other laws have strengthened civilian control and management of the Pentagon to a level that simply did not exist when the Manhattan Project began in 1939 or when “Little Boy” fell on Hiroshima in 1945. This argument misses the point.

The reason most cited as to why the NNSA should not be turned over to the DoD is the widely held belief that military management of the weapons laboratories would hinder their superb scientific research—particularly in basic science and fundamental physics.²⁵ Whether or not military leadership would impede the work of the labs is the accusation that must be addressed in order to move forward with any proposal to turn the NNSA into a defense agency. To date, this charge has not been addressed adequately.

Also not addressed adequately is the allegation that the military might use the NNSA budget as a bill payer for underfunded military programs, as the DoE currently does for nondefense energy programs. Before his departure, Secretary of Defense Robert Gates agreed to transfer more than \$5 billion dollars from the defense budget to the NNSA during the coming years. However, following Gates’s departure from the Pentagon, President Obama called for “modest changes” to the military budget, ranging between \$500 billion to \$1 trillion in cuts in coming years. In addition, eagerness to provide budgetary support to the NNSA varies sharply from the wonkish Office of the Secretary of Defense to the military service departments, whose Title X mission forces each into emotional budget trade-offs between various big ticket procurement programs to “organize, train, and equip” their service branches for employment by the combatant commanders. With no guarantee that the Department of the Navy would not siphon NNSA funds to offset SSBN(X) costs or the Department of the Air Force to bankroll the Next-Generation Bomber, a wholesale transfer of the NNSA from the DoE to the DoD replaces “the devil you know for the devil you don’t.”

23. Referred to as “instruments of national policy more than weapons of military operations” by the “Report of the Defense Science Board Task Force on Nuclear Capabilities.”

24. The PFIAB Reports cites this for retaining a semiautonomous agency within DoE.

25. The Perry-Schlesinger Report cites the findings of a March 2009 report conducted by the Henry L. Stimson Center. See Frances Fragos Townsend, Donald Kerrik, and Elizabeth Turpen, “Leveraging Science for Security: A Strategy for the Nuclear Weapons Laboratories in the 21st Century,” Task Force on Leveraging the Scientific and Technological Capabilities of the NNSA National Laboratories for 21st Century National Security, Henry L. Stimson Center, Washington, March 2009.

Option 3: Transfer the Production Complex to Department of Defense While Retaining the Weapons Laboratories and the Nevada Test Site within the NNSA

The commission also dismissed their third option for reform. The Defense Science Board in that same 2006 report weighed splitting the production complex from the weapons labs and test site and concluded, “On balance, Department of Defense alone is not a good fit.”²⁶ The commission’s other major concern was that option three “eliminates the independent voices in the process of annual stockpile certification that comes from involving multiple agencies.”

Option 4: Establish the NNSA as an Independent Agency Reporting to the President through the Secretary of Energy

The Perry-Schlesinger Commission ultimately settled on the fourth reform proposal reviewed, which they found to be less appealing but more politically feasible than the fifth. It is clear why this proposal is less politically painful—it closely resembles the status quo. It is hard to see a difference between (1) an NNSA semiautonomous within the DoE and; (2) an NNSA that is fully autonomous but reports to the president through the secretary of energy. The fourth option too closely resembles the first—strengthening the NNSA within the DoE through legislation. How is this different? What changes?

Further, if Congress fully separated the NNSA from the DoE, would it still make sense to maintain the secretary of energy as the chosen Cabinet-level secretary through which to report to the president? Without the NNSA, the secretary of energy is left overseeing a bureaucracy concerned primarily with energy efficiency and renewable resources and without any discernible national security role in the traditional sense. And there are other candidates. The secretary of defense would make a better intermediary by reflecting the NNSA’s work on nuclear weapons and naval nuclear propulsion. The secretary of state could be chosen to reflect the NNSA’s role in nuclear nonproliferation. Even the director of national intelligence or the secretary of homeland security could represent the NNSA to the White House, given the NNSA’s work in support of nuclear detection, both foreign and domestic.

Option 5: Establish the NNSA as an Independent Agency Reporting to the President with a “Board of Directors” Composed of the Secretaries of Energy, Defense, State, and Homeland Security plus the Director of National Intelligence

The Perry-Schlesinger Commission’s fifth NNSA governance reform proposal addresses this conundrum. It suggests an independent NNSA reporting to the president through the chair of a “Board of Directors” composed of interagency Cabinet-level stakeholders.²⁷

26. “Report of the Defense Science Board Task Force on Nuclear Capabilities.”

27. An almost identical proposal first surfaced in the “Report of the Defense Science Board Task Force on Nuclear Capabilities.” The DSB called for a “National Nuclear Weapons Agency” (NNWA) headed by a Senate-confirmed Administrator similarly overseen by a “Board of Directors” composed of the secretaries of energy, defense, homeland security, and the director of national intelligence. The secretary of state is absent from the DSB proposed Board because their NNWA would lack NNSA’s current nuclear nonproliferation mission. In their proposal, the secretary of defense would chair the Board of Directors.

The commission's final report explains the advantages:

Option 5 is the most appealing as a reflection of the broader national mission of the laboratories. It is also the option that comes closest to the model that worked for decades: the Atomic Energy Commission. From 1946 to 1975, the AEC provided a clear reporting line: the laboratories and the plants reported to the Commission and the chairman report to the President. It was disestablished when priority was given to the energy crisis of the early 1970s. But option 5 does not appear to be politically practical at this time.

Getting the attention of Congress and returning the NNSA's political and budget prioritization to Cold War levels in a post-Cold War march toward "a world without nuclear weapons" means understanding and expanding the NNSA's interagency roles. In addition to maintaining the safety, security, and effectiveness of the nuclear stockpile, the NNSA's work in nuclear propulsion for U.S. Navy surface and subsurface combatants, technical work for the intelligence community, and nuclear nonproliferation efforts with the Department of State demonstrate the promise of a nimble, dynamic institution within America's national security architecture. As such, an interagency Board of Directors is the solution to NNSA governance that most earnestly reflects the NNSA's diverse responsibilities. And by designating a chair of the board, the NNSA maintains a Senate-confirmed Cabinet-level spokesperson and budget champion in negotiations with the president, Office of Management and Budget, and interagency resource competitors.

But the devil is in the details—the budget details, to be exact. Would the budget of an independent NNSA still be delivered to Congress as part of the DoE's budget request? If not, would it have its own dedicated budget, similar to that of the Environmental Protection Agency?²⁸ If so, would funding for the first FY of this independent agency be carved directly "out of hide" from the DoE's budget, or would each agency represented on the Board of Directors "chip in" to this new independent agency? Would the Office of Management and Budget expand the top-line budgets of these departments to "make room" for their contribution to the newly independent NNSA, or would they too be required to "take it out of hide" sparking internal resource competition and bureaucratic resentment toward the NNSA? What impact would these budget considerations have upon congressional oversight jurisdictions?

Such considerations likely led the commissioners to dismiss the "most appealing" proposal they reviewed as not "politically practical at this time." Although the commission was correct to identify this fifth proposal as the "most appealing," the commissioners were wrong to discount its political feasibility, which must be left to the determination of America's elected officials.²⁹

28. This is the recommendation of the Perry-Schlesinger Commission.

29. Seventeen months after release of the Perry-Schlesinger Report, the 2010 election delivered the House of Representatives back to Republican control for the 112th Congress. The former HASC Special Panel chairman became the vice chairman of the full HASC.

Congressional Oversight of the National Nuclear Security Administration

Demonstrated by the debate over its governance structure, the NNSA is an organizational oddity in the U.S. federal government. The NNSA's relationship to Congress is no less strange. The NNSA shares its authorizing committees, the House and Senate armed service committees, with the DoD. However, the House and Senate appropriations subcommittees on energy and water (E&W), not the subcommittees on defense, appropriate funds for the NNSA.

The mixed congressional jurisdiction of the NNSA reflects its history and contentious creation. Ten years ago, DoE reform efforts met both Republican and Democratic opposition in the House. Indeed, Representative John Dingell (D-Mich.), ranking member on the Energy and Commerce Committee (HECC), raised a point of order against the FY 2000 NDAA on the House floor. He tried to protect the jurisdiction of the HECC, which has authorizing jurisdiction over the DoE. He lost the battle, and the measure was sent to the Senate. Senator Domenici protected the provision in the Senate only as long as his Senate Appropriations Subcommittee on E&W Development maintained jurisdiction of NNSA appropriations, which was agreed on—hence the bifurcation of authorization and appropriations oversight of the NNSA (table 2).

In the years since the NNSA's creation, this hybrid arrangement of congressional oversight has proved problematic. Authorization committees' funding levels generally meet the NNSA's annual budget request and at times exceed it. Authorized NNSA spending is routinely hundreds of millions of dollars higher than appropriated spending. This is because within the E&W subcommittee jurisdiction, the NNSA does not compete with other similar weapons projects for taxpayer dollars but with qualitatively different and politically more popular Army Corps of Engineer water development projects and faddish renewable energy initiatives. Thus the House Appropriations Subcommittee on Energy and Water (HAC-E&W) perennially underfunds the NNSA's budget request to make room for member "adds" (the SAC-E&W is more kindly to the NNSA). So in the same way that NNSA funding is at times used as a bill payer within the DoE during internal budget prioritization and preparation, so too is the NNSA's budget trimmed as a bill payer by the HAC-E&W for member earmarks and popular projects. History proves this to be the case irrespective of which party is in the majority.³⁰

But the concern is not strictly over top-line funding levels for the NNSA. Specific national security programs also suffer. The now-defunct reliable replacement warhead was created and supported vigorously by NNSA authorizers but routinely underfunded and ultimately defunded by NNSA appropriators. Perennial appropriations shortfalls prevent the required sustainment, maintenance, and modernization of the physical infra-

30. Representative Michael Turner (R-Ohio), the HASC Strategic Forces Subcommittee chairman, recently scolded his Republican counterparts on the HAC-E&W for cutting \$1.1 billion, more than 10 percent, from NNSA's budget for FY 2012. Michael Turner, "Address of Nuclear Strategic Forces Policy," delivered at Carnegie Endowment for International Peace, Washington, July 26, 2011.

Table 2. Historical Budget Chart of the National Nuclear Security Administration (NNSA) Budget Requests, and House and Senate Authorization and Appropriations Action, fiscal years 2003–2012 (thousands of dollars)

Fiscal Year	NNSA Request	HASC Mark	SASC Mark	HAC-E&W Mark	SAC-E&W Mark	Authorization Conference	Appropriations Conference
2003	8,038,734	8,034,349	8,160,043	7,908,417	8,267,308	8,038,490	8,217,308
2004	8,834,575	8,834,600	8,933,847	8,508,184	8,920,389	8,877,347	8,666,247
2005	9,048,700	9,047,700	9,165,145	9,027,171	N.A.	9,082,300	9,163,941
2006	9,397,241	9,100,852	9,357,427	8,848,449	9,426,789	9,196,456	9,104,491
2007	9,315,811	9,265,811	9,333,311	9,227,611	9,257,414	9,300,811	N.A.
2008 ^a	9,386,833	9,436,833	9,539,693	8,786,881	9,564,545	9,576,095	8,810,285
2009	9,584,270	9,301,922	9,641,892	8,823,243	9,665,770	9,752,507	9,129,594
2010 ^b	9,945,027	10,479,627	10,051,215	9,215,062	9,998,863	10,033,477	9,877,027
2011	11,214,755	11,214,755	11,220,943	N.A.	11,109,755	11,214,755	10,501,431
2012 ^c	11,782,930	11,782,930	N.A.	10,599,031	11,050,000	N.A.	N.A.

Note: HASC = House Armed Services Committee; SASC = Senate Armed Services Committee; HAC-E&W = House Appropriations Subcommittee on Energy & Water; SAC-E&W = Senate Appropriations Subcommittee on Energy & Water; N.A. = not available.

^aFirst authorization and appropriations levels were determined by the Democratic majorities in the House of Representatives and Senate following the 2006 Democratic victory.

^bThis was the first NNSA budget request prepared by the Obama administration following his 2008 victory.

^cThese were the first authorization and appropriations levels determined by the new Republican majority in the House of Representatives following the 2010 Republican victory.

Sources: Relevant NNSA budget requests and House of Representatives and Senate Reports for fiscal years 2003–12.

structure of the nuclear weapons complex. The gross effect of perennial underfunding led Air Force general Kevin Chilton, commander of U.S. Strategic Forces Command, to call the NNSA's infrastructure "decrepit."³¹ His sentiments were reiterated by the Perry-Schlesinger Commission's findings. A decrepit infrastructure cannot maintain a safe, secure, and effective nuclear stockpile.

The commission explained the sharp funding disparities between the armed services authorizers and the E&W appropriators as a function of a lack of expertise and concern on the part of the latter for defense issues. They propose "that the NNSA budget be administered completely separately from the budget for any other agency. To implement this separation, the NNSA budget should be considered by the defense subcommittees of the House and Senate Appropriations Committees, thus ensuring both expertise and concern for defense issues."³² However, the commission does not explain why switching appropriations jurisdictions for the NNSA will prevent the agency from going from being a bill payer for district water projects to a bill payer for the MDA, SSBN(X), or Next-Generation Bomber under the purview of the defense appropriators.

Concern over congressional jurisdictions relating to various national security issues is long noted, not least of which by the National Commission on Terrorist Attacks on the United States (9/11 Commission). Even apparently sensible reforms, such as moving the funding jurisdiction of nuclear weapons from the subcommittee that builds dams and windmills to the subcommittee that funds all other military weapons is stalled by turf disputes between powerful representatives and senators.³³ Thus reform, though reasonable, is highly dependent upon support at the highest levels of congressional leadership.

The Obama Administration

President Barack Obama has received due praise for his personal interest in U.S. nuclear weapons policy. His Prague Speech, delivered so prominently and early in his term, coupled with U.S.-Russian negotiations of New START, the 2010 Nuclear Security Summit, and release of the Perry-Schlesinger Commission's final report led some to call the period from 2009 to 2010 a "nuclear renaissance" in the United States. This period culminated with the release of the Obama administration's much-anticipated *2010 Nuclear Posture Review (NPR)* report.

Congressionally mandated cyclical policy reviews such as the *Quadrennial Defense Review Report* and *NPR* allow a new administration to articulate a vision and set policy priorities. Such reviews are also an opportunity for change—an opportunity that the Obama administration did not fail to seize. Most notably, the 2010 *NPR* report altered the long-standing and strategically ambiguous nuclear declaratory policy of the United

31. This led the HASC to include legislation in the *FY10 NDAA* requiring a biennial strategy to sustain, maintain, and modernize the physical infrastructure of the complex.

32. "America's Strategic Posture."

33. E.g., the Homeland Security Act of 2002 moved the Coast Guard from the Department of Transportation to the Department of Homeland Security, yet the House authorizing committee remains the Transportation and Infrastructure Committee, not the Homeland Security Committee.

States. However, left unaltered and unmentioned by the 2010 *NPR* report was the issue of NNSA governance and oversight—a missed opportunity to lower costs and improve management, oversight, and accountability.

The DoE issued a Strategic Plan in May 2011 articulating the Obama administration’s priorities for the DoE.³⁴ This plan, like the *NPR* report, does not address any reform proposals regarding DoE’s relationship to the NNSA. Although the plan does cite a need and intent to improve management, transparency, and accountability, it does not link this need to the NNSA specifically, nor does it provide many implementation details. The NNSA published its own Strategic Plan in concert with that of the DoE.³⁵ Its final section identifies a new management approach dubbed, “OneNNSA,” calling for “eliminating internal stovepipes within the NNSA” and for the NNSA to use,

risk-informed, Federal oversight models that clarify roles and responsibilities and eliminate non-value added oversight activities. Our Enterprise partners will have greater flexibility, without compromising accountability, to realize cost savings and to further operational effectiveness. We will actively capture best practices in industry and across our Enterprise to solve problems more efficiently.

“OneNNSA” addresses internal NNSA-contractor management issues, not those caused by its relationship to the DoE. Though laudable, it is simply too early to tell to what extent the NNSA will be able to implement its stated reform initiatives and to what extent the DoE will help or hinder those efforts. History suggests the latter.

The NNSA Strategic Plan fails to reference the findings and recommendations of either the 2006 Defense Science Board report or the Perry-Schlesinger Commission, both of which were issued since the last NNSA Strategic Plan was published in 2004. The failure of either Strategic Plan to address the relationship between the DoE and the NNSA or that of the NNSA and Congress, constitutes a second major missed opportunity by the Obama administration to address these long and carefully documented challenges to effective NNSA governance.

Conclusion

With a sluggish U.S. economy, a presidential mandate to trim more than \$500 billion from national security spending, a “Super Committee” formed to balance the federal budget, and a deeply conservative Republican majority in the House eager to make deep non-national security spending cuts, it is time to get the most out of the NNSA. This requires reform. Because of repeated failures by the Obama administration to signal interest in NNSA reform and the nature of the NNSA as a legislative creation, it is Congress that must take the next step toward reform. And because initial reform began in the House a decade ago, it is only fitting that it begin there again.

34. Steven Chu, “Strategic Plan,” Department of Energy, May 2011, http://www.energy.gov/news/documents/DOE_StrategicPlan.pdf.

35. Thomas D’Agostino, “Strategic Plan,” National Nuclear Security Administration, May 2011, http://nnsa.energy.gov/sites/default/files/nnsa/inlinefiles/2011_NNSA_Strat_Plan.pdf.

Engaged U.S. representatives should therefore introduce a “National Nuclear Security Administration Amendments Act of 2011.” They should prove the Perry-Schlesinger Commission’s political calculations wrong by selecting the “most appealing” reform option—separating the NNSA from the DoE and establishing an interagency Board of Directors whose chair would represent the agency to the president.³⁶ To underscore the NNSA’s independence, either the DoE or the NNSA should be evicted from their current shared Washington headquarters in the James V. Forrestal Building and get a new headquarters.³⁷ They must ensure a separate budget for an independent NNSA. Concomitantly, they should lobby the House and Senate leaderships to transfer appropriations authority from the subcommittees on E&W to the subcommittees on defense.

An independent NNSA—fully resourced, properly positioned within the interagency system, and funded by befitting appropriators—will result in a better-managed nuclear security enterprise able to deliver value for the taxpayer’s investment and ensure the safety and reliability of America’s nuclear weapons.

36. A rotating chairmanship might address the commission’s concerns over political practicality.

37. Apart from the symbolism, it would end the dual-hatting of staff, an impediment to autonomy.

Extended Deterrence and Nuclear Non-proliferation: Lessons from European and East Asian Regimes Applied to the Middle East

Thomas Devine

The United States' enthusiasm for its alliances has ebbed and flowed over time through bouts of isolationism, up to today's era of "special relationships" and "nuclear umbrellas." This paper focuses on U.S. nuclear alliances as it explores the origins of the extended deterrence regimes in Europe and East Asia. Both regimes have provided allies with the assurance of a U.S. response to an adversary's aggression. A by-product of this assurance should have been the strengthening of the nuclear nonproliferation norm. Although this has nominally been the case, two glaring discrepancies stand out: the inauguration of the British and French independent nuclear deterrent. This paper first reexamines past research concerning the motivations for acquiring nuclear weapons and concludes that the main causes are a nation's security, domestic politics, and prestige. It then focuses attention on how U.S. actions have exacerbated these issues and have influenced the nuclear calculus of American allies. Drawing on lessons learned from this examination, the paper concludes with items for the United States to consider in any future scenario involving more formalized extended deterrence in the Middle East. A renewed focus on improved bilateral communication is of paramount importance in order to alleviate both an evolving Saudi security dilemma and Egyptian legitimacy concerns. Such a supposition is based on continued U.S. support for nonproliferation in the region in the midst of any future overt Iranian nuclear weapons program.

Why States Acquire Nuclear Weapons

To best examine the nonproliferation successes and failures of extended deterrence regimes, one must first look at the motivations for states to pursue these weapons. Scott Sagan and Joseph Cirincione provide an analysis of this subject.¹ Both these scholars

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1. Scott D. Sagan, "Why Do States Build Nuclear Weapons?" *International Security* 21, no. 3 (Winter 1996–1997): 54–86; Joseph Cirincione, *Bomb Scare: The History and Future of*

agree that security concerns are an important motivator for nuclear weapons development, especially within a realist paradigm of analysis, where power is derived from military and economic might. Within this framework, the introduction of nuclear weapons into the international system creates a security spiral, where “proliferation begets proliferation,” as George Shultz summarizes the phenomena.² This spiral began with the initiation of the German nuclear program during World War II. The U.S. response in the form of the Manhattan Project was driven by a fear of Nazi Germany obtaining an atomic bomb first. Using the proliferation cascade paradigm, possession of such a weapon by the United States created a security dilemma for the Soviet Union, which in turn prompted its nuclear weapons program. Historically wary of a rising Russia, both Great Britain and France did not remain idle and established their own nuclear weapons programs. Later, the fallout of the Sino-Soviet split created a security dilemma for China that drove it to acquire the bomb. This action prompted a final cascade by instigating a nuclear India, which then provoked the inauguration of Pakistan’s nuclear weapons program.

However, security is not the only factor that states use in their decisionmaking on when and whether to develop nuclear weapons. Both Sagan and Cirincione also point to domestic issues as another key motivation. The domestic model is often led by the nuclear energy establishment, the leaders of states themselves, and certain members of the military, particularly the air force and navy. Thus, “nuclear weapons programs are solutions looking for a problem [to] which to attach themselves so as to justify their existence.”³ Cirincione and Sagan both cite India’s nuclear weapons program as the best example of a domestic issue finding a nuclear solution. India waited a decade to test its first nuclear device, rather than testing immediately after China demonstrated its capability. Sagan states that the timing of this action was not what the proliferation cascade paradigm would predict under the security model. Additional scholarship on the subject states that “India’s development of nuclear weapon capability only vaguely responded to an ill-defined security threat.”⁴ Furthermore, the fact that Prime Minister Indira Gandhi’s public approval rose by a third in the month following the test shows how the pursuit of a nuclear weapons program has positive secondary effects on the domestic interests that its development is, in part, meant to appease.⁵

Sagan and Cirincione share a final model to explain the impetus for states to develop nuclear weapons. Sagan describes this as the “norms model,” whereas Cirincione calls it “nuclear prestige.” Both scholars describe this model as describing a country’s pursuit of nuclear weapons as a way to assert its importance on the international stage and maintain relevancy. For the purpose of this paper, the domestic and norms/prestige models are grouped together as the “nuclear legitimacy” model. The term “domestic legitimacy” re-

Nuclear Weapons (New York: Columbia University Press, 2007).

2. Sagan, “Why Do States Build Nuclear Weapons?” 57.

3. Cirincione, *Bomb Scare*, 66.

4. George Perkovich, *India’s Nuclear Bomb: The Impact on Global Proliferation* (Berkeley: University of California Press, 1999), 6.

5. Sagan, “Why Do States Build Nuclear Weapons?” 68.

fers to the aspirations of political leaders to maintain domestic popular support, whereas “international legitimacy” refers to the prestige that states gain upon the acquisition of nuclear weapons. Both security and nuclear legitimacy factored into Great Britain’s and France’s decisions to acquire nuclear weapons, but before fully analyzing their roles, one must understand the security environment of the post–World War II world.

The Origins of Post–World War II Extended Deterrence

After World War II, Great Britain and France faced the very Russian Bear that they had united to thwart in the Crimean Peninsula a century earlier. The Soviet Red Army, striding across the Eastern European plains, embodied a historic security-nightmare-turned-reality for these traditional European powers. In the face of such a security dilemma, and with their economies reeling from years of war, Great Britain and France led the European effort to reach out to the United States for support on both fronts. The United States assuaged these concerns with the Marshall Plan and the foundation of NATO. Although both these programs formed the shape of what would become the extended deterrence regime for Europe, events in East Asia provided the crucible.

Post–World War II East Asia found the United States engaging with a divided China and Korea, while occupying a defeated Japan. This occupation was a near-unilateral situation for the United States, in contrast to the multilateral division of occupied Germany. This state of affairs, coupled with the fact that both Korea and large swaths of China had only recently been liberated from decades of occupation, meant that much of the U.S. effort in the region had to focus on rebuilding these individual nations. Any movement toward regional cohesion was overshadowed by the immediacy of this need. The absence of regional cohesion remained the status quo even after hostilities began to swirl across the region. These events included the Nationalists in China being driven off of the mainland by Communist forces, the outbreak of the Korean War less than a year later in June 1950, and the first Taiwan Strait Crisis later that summer.

However, the situation remained very different from the conditions in Western Europe, where more established U.S. bilateral relationships had aided the formation of NATO. Instead, three factors created the foundation of an extended deterrent regime in East Asia based solely on bilateral relationships rather than the collective security arrangements established in Europe. These factors include the above-mentioned absence of panregionalism, the responsibility undertaken by the United States for Japan’s defense, and the immediate security needs of U.S. allies in Taiwan and South Korea, which were in the midst of civil wars. This bilateral regime structure grew to resemble a “hub and spokes,” in which the United States served as the hub, and the spokelike relationships among the allies in the system never congealed into a unified collective security regime.

Despite influencing the failure to create an East Asian defense alliance, the Korean War did much to provide the momentum for greater military cohesiveness in Europe. The war raised the importance of formalizing many of NATO’s command structures and also forced the United States to begin contemplating its own nuclear command-and-con-

trol operations.⁶ A growing sentiment of the existence of a united Communist Bloc bent on overpowering a divided West fueled a determination not to “lose” any more nations to Communist forces, as was deemed to have been the case in China. These factors contributed to a renewed push for further European solidarity in military affairs. The final manifestation of this drive was the decision to remilitarize West Germany and allow it to enter NATO in 1955.⁷ This decision came on the heels of the armistice agreement ending the Korean War two years earlier and served as a final example of the causal relationship between East Asian hostilities and the drive toward collective European defense.

With Germany now integrated into NATO, the pre–World War II security dilemmas of Europe were beginning to fade away. As NATO’s first secretary-general, Lord Hastings Ismay, famously observed, the alliance’s vision of “keeping the Russians out, the Americans in, and the Germans down” was coming to fruition.⁸ Given the emphasis on collective defense, one would think that the rationale for the proliferation of nuclear weapons, exhibited by the security model, would nearly be eliminated in Europe. This mindset would also seem to be the case in the East Asian theater, where the United States had so overtly committed its blood and treasure to defend its regional allies. With the security model’s rationale minimized, one would expect the norm of nonproliferation to be on the march. However, further analysis of the British and French motivations for the pursuit of nuclear weapons reveals why this was not the case.

The Nonproliferation Failures of Extended Deterrence

Great Britain tested its first nuclear device in 1952, and France followed with its first test in 1960. Despite the drive for structured collective defense in Europe, which was inspired largely by events in the East Asian theater and continued fears of the spread of Communism, these two nations represented a failure of European extended deterrence to continue the promotion of nuclear nonproliferation. Although one can argue that the concept of nonproliferation as a policy was only in its infancy, if the goal of NATO was to promote regional collective security, two questions must be addressed: What compelled two countries within the alliance to unilaterally seek independent nuclear deterrents? And how did U.S. actions factor into their decisionmaking?

Although the proximity to the growing Soviet threat produced legitimate British security concerns, U.S. actions also helped promote the notion of an independent British nuclear deterrent. The most critical U.S. action was the passage of the Atomic Energy Act of 1946 (also known as the McMahon Act), which restricted the transfer of any information or data pertaining to the manufacture or utilization of atomic weapons to

6. Paul H. Nitze, *NSC-68: Forging the Strategy of Containment*, edited by S. Nelson Drew (Washington, D.C.: National Defense University Press, 1996), 98.

7. Georges-Henri Soutou, “France,” in *The Origins of the Cold War in Europe: International Perspectives*, edited by David Reynolds (New Haven, Conn.: Yale University Press, 1994), 109.

8. Michael Lind, *The American Way of Strategy: U.S. Foreign Policy and the American Way of Life* (New York: Oxford University Press, 2006), 134.

third-party nations, including allies.⁹ This legislation sullied the relationship between American and British scientists, who had been critical to the Manhattan Project's success. The act also had ramifications for the development NATO's command structure because it disallowed foreign command of units possessing U.S. atomic weapons.¹⁰ This development only served to highlight any early British apprehension about NATO's limitations for solving its security dilemma.

Of greater importance, this act also fueled nuclear legitimacy stirrings within the British leadership. The effect of the perceived mistreatment by its American ally was evident when British foreign secretary Ernest Bevin exclaimed, in reference to the bomb, that "I don't want any other Foreign Secretary of this country to be talked to or at by a Secretary of State in the United States as I have just had. . . . We've got to have this thing over here whatever it costs. We've got to have the bloody Union Jack on top of it."¹¹ Bevin served in Prime Minister Clement Attlee's government, which came to power by ousting the British wartime prime minister, Winston Churchill. Although Attlee's election manifesto focused predominantly on domestic issues such as postwar development, he could not afford, politically, to look weak on international affairs.

The renegeing of the American partnership on nuclear weapons created a potentially tenuous domestic legitimacy issue for the Attlee government, especially in light of the previous Churchill administration's exemplary relationship with U.S. president Franklin Roosevelt during World War II. Attlee clearly expressed his frustrations with U.S. actions by speaking of "the stupid McMahon Act" and observing that the United States had become "inclined to think that they were the big boys and we were the small boys; we had to show them they didn't know everything."¹² Thus, the decision to go nuclear provided the domestic legitimacy and political coverage necessary to retain credibility in light of the affront to Britain's honor by the United States. Furthermore, the international legitimacy of an independent deterrent allowed Britain to regain prestige in compensation for losing the jewel of its fading empire upon India's independence.

France faced the same security considerations as Great Britain and similarly sought to alleviate them through the formation of NATO. As with the British, concerns over the reliability of NATO's collective defense played a part in the security model's rationale for developing an independent French deterrent, but these security concerns were exacerbated by a perceived lack of credibility with respect to nuclear weapons usage by the United States. In another example of events in East Asia affecting security decisions in Europe, this credibility gap was first on display in the U.S. indecisiveness over

9. Atomic Energy Act of 1946, PL 585-724, § 5(a) (2), 60 Stat. 755, 760 (codified as amended at 42 U.S.C. § 2011 (2000)).

10. Sean Maloney, *Securing Command of the Sea: NATO Naval Planning 1948-1954* (Annapolis, Md.: Naval Institute Press, 1995), 234.

11. Bruce Kent, "Resisting the British Bomb: The 1980s," in *The British Nuclear Weapons Programme, 1952-2002*, edited by Douglas Holdstock and Frank Barnaby (New York: Routledge, 2003), 67.

12. Mark Phythian, *The Labor Party, War and International Relations, 1945-2006*, (New York: Routledge, 2007), 30.

nuclear weapons usage in the Korean War. French concerns were explicitly manifest in the dithering and eventual denial of U.S. air support upon France's request at Dien Bien Phu in May 1954.¹³ The decision by the United States not to provide out-of-theater support to French Indochina further maligned French-U.S. bilateral relations. This estrangement continued to build in the aftermath of the Suez Crisis two years later. Furthermore, NATO's refusal to support the French counterinsurgency campaign in Algeria also reduced its trust in the organization as a means to guarantee French security concerns.¹⁴ These actions compelled the French to withdraw from NATO command, which preceded France's initial nuclear test by only a few months.

Despite these security concerns, nuclear legitimacy also played an important role in the French decision to proceed with a nuclear weapons program. International legitimacy certainly played a part, especially because France's historic rival for Western European hegemony, Great Britain, already possessed the bomb. Furthermore, the difference between the French and British reactions to the aftermath of the Suez Crisis highlighted additional legitimacy concerns. Great Britain quickly worked to reestablish its "special relationship" with the United States, which was codified by the 1958 U.S.-UK Mutual Defence Agreement. In contrast, France felt further marginalized as a U.S. ally and more motivated to secure an independent deterrent. This maligning of bilateral relations was not dissimilar to the British experience a decade earlier, and it produced similar results.

A key lesson to draw from both these nonproliferation failures is that the United States must recognize the importance of bilateral communication within theater-wide extended deterrence regimes. Better communication could alleviate both the security and nuclear legitimacy issues that propel states to inaugurate nuclear weapons programs. For example, the United States refused to commit to a clearly defined position on the role and usage of nuclear weapons during Korean War-era discussions with British diplomats.¹⁵ This lack of communication may have been used by the British as further pretext for a security model rationale for its independent deterrent. However, once tactical weapons were introduced in theater with a clear command structure in place, this rationale was mitigated. Another example was the failure of the United States to explicitly communicate that NATO's extended deterrent did not persist outside the European theater. Because France's security concerns at the time continued to include its non-European holdings, this ambiguity was a significant factor in its pursuit of the bomb. Improved bilateral communication would allow the United States to better assure the security of its allies that are capable of pursuing a nuclear weapons program, and to avoid damaging relationships by acting in a manner that undermines these nations' domestic or international nuclear legitimacy.

13. Rebeca Grant, "Dien Bien Phu," » *Air Force Magazine*, August 2004, 83.

14. Irwin M. Wall, *France, the United States, and the Algerian War* (Berkeley: University of California Press, 2001), 74.

15. "Consultation Is Presidential Business: Secret Understandings on the Use of Nuclear Weapons, 1950–1974," *George Washington University: The National Security Archive*, <http://www.gwu.edu/~nsarchiv/NSAEBB/NSAEBB159/usukconsult-1.pdf>.

The Nonproliferation Success of Extended Deterrence: Questions for the Future

The best example of a case where the United States had provided the legitimacy and security assurances necessary to disincentivize the proliferation of nuclear weapons within the European theater was the decision to rearm and integrate West Germany into NATO. This action created a more secure border with Communist Eastern Europe. But equally important, it established a significant portion of Germany as an ally. This decision ameliorated a traditional security concern on the continent. Furthermore, readmitting the Germans into Western Europe demonstrated that postwar leaders had learned from the disastrous aftermath of World War I, in which a defeated Germany's Treaty of Versailles obligations fueled the rise of the Nazi Party. The decision not to repeat such harsh treatment toward Germany stunted any potential domestic or international legitimacy-fueled drives to a German nuclear weapons program.

Although the Cold War remained “cold” in the European theater, the East Asian security situation remained in a state of frozen conflict. As discussed, this situation contributed to the U.S. decision to satisfy each of its allies' security dilemmas through bilateral mutual defense pacts. However, the United States did pursue multilateral defense in Southeast Asia via the Southeast Asia Treaty Organization (SEATO). The U.S. preference for bilateral relationships in the region continued, as evidenced by the fact that SEATO did not contain an equivalent to NATO's Article V commitment for the United States to come to the defense of its allies if attacked.¹⁶ The East Asian nations of Japan, South Korea, and Taiwan were excluded from SEATO and never forged their own collective defense regime. Some scholars believe that this exclusion was based on the United States' determination to contain its “rogue allies” in East Asia to ensure that any isolated conflict did not escalate into regional strife.¹⁷ However, an alternate interpretation could view these actions as the successful U.S. management of the nuclear legitimacy concerns of its East Asian allies. By placing both American troops and tactical nuclear weapons in theater, the United States removed the most pressing issue that could have ignited a domestic legitimacy drive for nuclear weapons. And even if the United States' handling of its “rogue allies” was motivated by its own self-interest, the result has been beneficial for the nuclear nonproliferation regime.

In addition to removing the legitimacy issues that could have driven regional allies toward nuclear weapons programs, one can attribute the nonproliferation success of the East Asian extended deterrence regime to the fact that the United States adequately fulfilled its security requirements. The current absence of indigenous nuclear weapons programs among allies across the region is a strong indicator of this success. However, the continued nonproliferation achievements of this regime are predicated on the condition

16. Christopher Hemmer and Peter J. Katzenstein, “Why Is There No NATO in Asia? Collective Identity, Regionalism, and the Origins of Multilateralism,” *International Organization* 56, no. 3 (Summer 2002): 578.

17. Victor D. Cha, “Powerplay: Origins of the U.S. Alliance System in Asia,” *International Security* 34, no. 3 (Winter 2009–2010): 158–196.

that both security and legitimacy issues continue to be sufficiently addressed and clearly communicated. Concerns surrounding the growing Chinese and North Korean security threats are beginning to strain the status quo. Furthermore, recent actions by the United States have called into question the means whereby extended deterrence in East Asia will be implemented in the future. These actions include the United States' intention to retire the Tomahawk Land Attack Cruise Missile / Nuclear and its desire to pursue further cuts to its strategic nuclear forces. However, the United States is perhaps beginning to recognize the importance of bilateral communications in mitigating both security and legitimacy concerns within extended deterrence regimes. Evidence of this development can be found in the latest *Nuclear Posture Review Report*, which outlines the United States' intention to pursue strategic dialogues with its East Asian allies.¹⁸

Although NATO experienced two nonproliferation failures early in its history, the overall nonproliferation success of the regime is evident in the belief that a nuclear breakout scenario for countries within the alliance remains unlikely, even in the face of a nuclear Iran. One may present Turkey as a possible proliferator, but as long as NATO continues to place emphasis on regional missile defense as a core element of its collective defense architecture, then any security model rationale that could inspire such a move would be preemptively addressed.¹⁹ However, NATO's history of nonproliferation success is not without its weaknesses. The alliance's consensus arrangement has created an institutional inertia that has produced credibility concerns for its newer members.

This apprehension can clearly be seen in the enthusiasm gap between the newer NATO member states from the ex-Communist Bloc, which value the role of nuclear weapons for extended deterrence, and the Western European states, which view Russia as less of a threat. The United States must carefully communicate its future intentions for European security to both groups so as not to stimulate nuclear legitimacy concerns in each. Labeling these divisions as "old Europe" and "new Europe" represents, at best, a misguided approach. At worst, such hubris probably has a familiar ring to those who are aware of the historical mistreatments perceived by the British and French preceding the inauguration of their nuclear weapons programs.

Although structurally different, the extended deterrence regimes of Europe and East Asia share an institutional rigidity that does not lend itself to changing security situations. This inflexibility has ramifications for the continuance of both regimes' nonproliferation successes. Since the fall of the Soviet Union, the absence of a defined adversary or shared threat perception has divided members of the NATO alliance. In East Asia, the absence of such a threat was one of the main disincentives to the formation of a collective defense regime. The growing regional security threat represented by a rising China has begun to fill this void.

However, a volatile situation could develop if the reallocation of the United States' military resources in the region were to be viewed by its allies through a zero-sum prism

18. U.S. Department of Defense, *Nuclear Posture Review Report*, April 2010, 32.

19. Steven A. Hildreth and Carl Ek, *Missile Defense and NATO's Lisbon Summit* (Washington, D.C. Congressional Research Service, 2010), 6.

in which one nation's strengthened assurance came at the perceived expense of another. The reliance on bilateral defense arrangements and lack of a unified regional defense apparatus could aggravate such thinking. The lesson for the United States to apply to the Middle East is that any new formalized extended deterrent must mitigate its allies' security concerns stemming from a clearly defined adversary but remain flexible to adjust to the changing security environment. To achieve nuclear nonproliferation success, extended deterrence in the Middle East must also give equal treatment to the consideration of domestic and international nuclear legitimacy issues.

The Security Environment of the Middle East Today

To best understand the potential need for the nonproliferation benefits of extended deterrence in the Middle East, one must first understand the possible motivations for a nuclear weapons program in Egypt and Saudi Arabia, the two hegemonies of the Arab world. The security model plays a significant role in any scenario surrounding a possible Saudi nuclear weapons program. Saudi Arabia has looked across the Persian Gulf with caution since the Iranian Revolution. The Kingdom first responded to this security dilemma by acting as a conduit for weapons to Iraq in support of its war with Iran.²⁰ However, the subsequent Iraqi invasion of Kuwait served to further intensify Saudi Arabia's vulnerability and caused the Kingdom to doubt its ability to defend itself. These concerns would only be amplified upon the completion of an Iranian nuclear bomb and could compel Saudi Arabia to pursue its own nuclear weapons program.²¹ Such a scenario follows the rationale of the security model and the paradigm of cascading nuclear proliferation.

The security model also provides an explanation for the motivations for a potential Egyptian nuclear weapons program. Like Saudi Arabia, Egypt's channeling of weapons to Iraq was rooted in its own security fears concerning revolutionary Iran.²² However, these security concerns have dissipated over time, as displayed by remarks from an Egyptian military officer stating that Egypt could accept a nuclear Iran because it would balance Israel's undeclared nuclear weapons program.²³ Such statements show a tacit approval of Iran's nuclear ambitions, rather than a sense of fear for Egyptian security. Yet because the security model provides only a flimsy explanation of the motivations for a potential Egyptian nuclear weapons program vis-à-vis an Iranian threat, one must look to nuclear legitimacy for the remainder.

20. Murray Waas and Craig Unger, "In the Loop: Bush's Secret Mission," *New Yorker*, November 2, 1992, 70.

21. "Saudi Arabia Threatens to Build Nukes If Iran Acquires Them," *Nuclear Threat Initiative: Global Security Newswire*, June 30, 2011, http://gsn.nti.org/gsn/nw_20110630_2307.php.

22. Waas and Unger, "In the Loop," 70.

23. Saira Khan, *Nuclear Proliferation Dynamics in Protracted Conflict Regions: A Comparative Study of South Asia and the Middle East*, (Burlington, Vt.: Ashgate, 2002), 254–255.

The events of the Arab Spring underscore the fate of leaders who fail to maintain popular support, even in an autocratic state. After three decades of rule by President Hosni Mubarak, the new Egyptian regime needs to secure and maintain its domestic legitimacy. Egypt's current internal instability may require dramatic measures to achieve such a purpose. The inauguration of an Egyptian nuclear weapons program would certainly qualify. This action would allow the new Egyptian leadership to consolidate its power and co-opt the nationalist feelings of the Tahir Square revolution by focusing attention away from pressing domestic concerns. However, this scenario could only be instigated by events outside Egypt's borders. An overt demonstration of Iran's nuclear capability and the subsequent Saudi pursuit of the bomb could provide this necessary external catalyst.

Egypt has long been a leading power in the Arab world. This traditional hegemonic role was bestowed upon it in large part due to its leadership in promoting an ideology of pan-Arabism.²⁴ Egypt has also taken the lead in arbitrating peace in the region, especially because Israel could view it as a fair broker in the aftermath of the two nations' peace treaty. In recent years, however, Saudi Arabia has begun to rival Egypt for regional hegemony. Not only has the Kingdom continued to expand militarily and economically, but it has also raised its diplomatic profile by promoting its own peace overtures. These programs have included the Arab Peace Initiative with Israel and the 2007 conflict brokerage between the rival Palestinian factions of Hamas and Fatah. Saudi possession of nuclear weapons would continue its regional rise at the expense of Egyptian international legitimacy. This blow to Egyptian prestige, coupled with the new Egyptian leadership's motivation to establish and maintain domestic legitimacy, could begin to erode the current nonproliferation status quo in the Middle East.

Conclusion: Considerations for Extended Deterrence in the Middle East

The United States has an opportunity to draw on the lessons learned from the nonproliferation successes and failures of existing extended deterrence regimes in order to prevent a nuclear breakout in the Middle East. Such lessons provide the means to preempt the Saudi security dilemma stemming from an Iranian nuclear weapon and alleviate any Egyptian legitimacy concerns as a result of the potential Saudi response. The United States could begin to solve the Saudi security concerns in a variety of ways. One important component could be discussions on topics ranging from sharing of short- and medium-range missile defense technology to possibly including the extension of the European Phased Adaptive Approach to the Arabian Peninsula. However, the most important way to assuage the Kingdom's security concerns may come from the United States' rhetoric concerning its policy for the region. In this regard, the Obama administration must balance competing Egyptian and Saudi interpretations of the events of the Arab Spring.

24. Emily Landau, *Arms Control in the Middle East: Cooperative Security Dialogue and Regional Constraints* (Portland: Sussex Academic Press, 2006), 119–120.

The Egyptian people see their actions as a triumph of liberty over authoritarianism. As the embodiment of authoritarianism in the region, the Saudi royal family is clearly disconcerted by this interpretation. To strike a balance, the United States must deliberately back away from the Egyptian domestic situation and allow the Egyptian people to settle their own affairs. However, this does not mean that the United States should turn a deaf ear to any requests for financial, military, or diplomatic assistance in Egypt's quest to forge itself anew. It is in the best interest of the United States to maintain a proud and prosperous Egypt to moderate any potential domestic nuclear legitimacy concerns. However, a reformed and perhaps more democratic Egypt would surely antagonize the monarchists of the Saudi regime. The Obama administration must recognize that such a situation could create a potential domestic legitimacy issue for Saudi Arabia. This fact places even greater emphasis on the need to communicate effectively with the Saudi regime that the security the United States provides is not predicated on the diminishment of the Saud family as the leaders of the Kingdom. Walking the tightrope between the advancement of both security and democracy has been a common theme for the United States in the region.

A successful extension of extended deterrence to the Middle East could have positive ramifications elsewhere. In the midst of falling U.S. defense spending and continued nuclear arms reductions, the United States' successfully tailored security assurances for its Arab allies' will also demonstrate its credibility to its allies in Europe and East Asia. Maintaining such a signal will require the continuation of enhanced bilateral communication within existing extended deterrence regimes. The strategic dialogues outlined in the current *Nuclear Posture Review Report* are a good start, but further integration of allies' input into U.S. defense planning will be needed to maintain the nonproliferation benefits of their continued assurance.

Can Nuclear Forensics Deter Nuclear Terrorism?

Shaheen Azim Dewji

Because the production of nuclear material is arduous in the absence of state-based resources, nuclear forensics can potentially be employed to identify the provenance of sample materials. Consequently, nuclear forensics provides the basis for a state-based deterrence strategy, which has existed since the Cold War and whereby states are not only responsible for their own weapons but can now also be held accountable if nuclear materials or technology are traced back to them. Beyond this traditional notion of state-based deterrence, current proponents of nuclear forensics have strongly advocated this expertise and technology as an effective deterrent against nuclear smuggling or terrorism in the post-9/11 era. This concept, which is an extension of traditional deterrence theory, raises the question of whether nuclear forensics, although capable of attributing materials to a state facility, can deter nonstate actors. This paper examines various deterrence strategies in conjunction with the strategic application of nuclear forensics toward nonstate threats.

Introduction: Can Nuclear Terrorism Be Deterred by Nuclear Science?

Nuclear forensics can be used to identify the origin of intercepted raw fissile material for potential use in a nuclear weapon, or to identify the source and characteristics of a weapon through postdetonation sample analysis. Because the production of nuclear material is arduous in the absence of state-based resources and facilities, nuclear forensics can be employed to identify the provenance and pathways of sample materials. Given that state facilities tend to be required for the production of nuclear material suitable for nuclear terrorism, and given that traditional deterrence strategies have typically hinged on state-based accountability, the feasibility of a forensics-based deterrence regime, which can

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hinder nonstate actors from acquiring and employing nuclear material for use in acts of nuclear terrorism, must be questioned.

Nuclear forensics is increasingly being lauded by both the technical and political communities as an operative tool that, when employed in tandem with international cooperation, can seek to deter nuclear terrorism by holding individual states responsible for the security of their nuclear material in either a predetonation or postdetonation scenario. This capability is potentially instrumental in developing a nuclear terrorism deterrence strategy through state-based approaches. However, the nuances of employing nuclear forensics as a credible tool for deterrence against nuclear terrorism have not yet been fully extrapolated.

The implications beyond what has been discussed and expected strategically, technically, and even legally, are more complex in an ever-evolving threat environment where adversaries are dynamically adaptive. The technological capabilities and efficacy of nuclear forensics must not only be assessed, but also it must be determined where the burden must fall for policy to make forensics attribution an effective deterrent tool against proliferation and terrorism. Thus, a forensics capability is not a panacea for the deterrence of smuggling and terrorism, and its marriage with traditional deterrence strategies reveals insights in this respect. Although holding states liable for their nuclear material may shift the paradigm toward greater accountability, it may shift accountability away from the terrorist actors themselves. Consequently, this may not deter terrorist motivations, capabilities, or actions. In essence, by promoting a nuclear forensics regime, one must extrapolate who or what is being deterred, and where the correct actors must be targeted.

The security threats of the post–Cold War era have been defined by nonstate actors, as illustrated by the terrorist attacks on America on September 11, 2001. Terrorist groups of various capabilities and motivations have sought to develop nuclear weapons material so they can perpetrate nuclear terrorism. As reiterated by President Barack Obama during the Nuclear Security Summit of April 2010, nuclear terrorism remains the single biggest threat to U.S. security in both the near and long terms.¹ Al Qaeda has also declared its intentions to acquire nuclear material. This was confirmed by testimony in 2001, stating that al Qaeda had attempted to obtain uranium in Khartoum in the 1990s.² Additionally, documents seized by U.S. forces in Afghanistan revealed that al Qaeda was scrutinizing nuclear weapons information.³ The death of Osama bin Laden in May 2011 undoubtedly represents a significant milestone in the broader U.S. efforts to defeat

1. D. E. Sanger and W. J. Broad, “Leaders Gather for Nuclear Talks as New Threat Is Seen,” *New York Times*, April 11, 2010, <http://www.nytimes.com/2010/04/12/world/12nuke.html>.

2. Kimberly McCloud and Matthew Osborne, “WMD Terrorism and Usama Bin Laden,” Center for Nonproliferation Studies, 2001, <http://cns.miis.edu/reports/binladen.htm>.

3. David Albright, “Al Qaeda’s Nuclear Program: Through the Window of Seized Documents,” Nautilus Institute, Special Forum, 2002, http://oldsite.nautilus.org/archives/fora/Special-Policy-Forum/47_Albright.html; Steve Coll, “What Bin Laden Sees in Hiroshima,” *Washington Post*, February 6, 2005, www.washingtonpost.com/wp-dyn/articles/A365-2005Feb5.html.

al Qaeda; however, this should not detract from the perception that nuclear terrorism still remains a paramount threat from such nonstate actors.⁴ Al Qaeda, independent of a centralized figurehead, operates under the aegis of a branched, regionalized, and decentralized leadership in franchised cells. Although geographically disparate, these al Qaeda cells continue to operate under a common ideology, which has not changed with the death of bin Laden.

More recently, Russia's state security service has reported that terrorists are continually seeking access to nuclear materials, especially in the countries of the former Soviet Union.⁵ Consequently, it is evident that nonstate terrorist organizations have sought and are actively seeking to obtain nuclear weapons material, and have malicious intentions for using it against the United States. Furthermore, with the fear invoked in the public's reaction to the recent Fukushima Daiichi Nuclear Power Plant incident in Japan, this may reawaken terrorists' interest in nuclear attacks.

Accessing Nuclear Material

Although conventional forms of terrorism—such as localized suicide bombings, or even the attacks reminiscent of the 9/11 mode of operation—are difficult to prevent or punish vis-à-vis Cold War deterrence strategies, nuclear terrorism has the unique feature that it necessitates state involvement in the chain of causation actuating a nuclear attack. The production of fissile materials requires considerable funding, expertise, labor, and industrial resources only made possible in the purview of state-sponsored development. The production of plutonium requires a nuclear reactor infrastructure, along with reprocessing facilities to chemically extract the plutonium. The enrichment of uranium into highly enriched uranium currently requires centrifuge or gaseous diffusion technologies. Even further, state allocation of resources committed to producing fissile materials does not guarantee a successful nuclear weapons capability, because the weapons design and delivery are additional hurdles that are not lightly overcome.

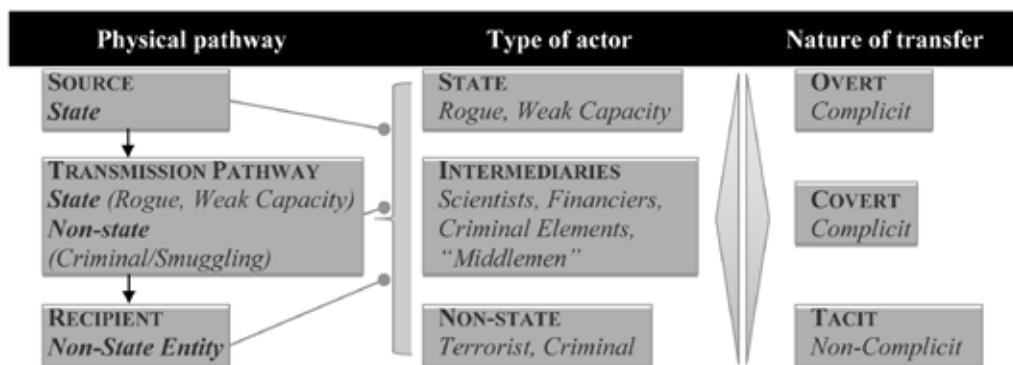
There are a variety of scenarios whereby a state could transfer nuclear material to rogue states or terrorists. The framework for the proliferation pathway analysis, given in figure 1, constitutes any permutation of its constituents and comprises three corresponding features: (1) a physical pathway; (2) a type of actor; and (3) the nature of the transfer. In these scenarios, which are by no means exhaustive, an overt transfer in this context refers to a scenario where one actor is complicit in its deliberate transfer of nuclear technology or material to another actor. A covert transfer is a situation in which elements of the state bureaucracy covertly, but deliberately, transfer materials to another actor. A tacit transfer is a covert scenario where material is smuggled or stolen. In this last situation,

4. Fissile Materials Working Group, "After Bin Laden: Nuclear Terrorism Still a Top Threat," *Bulletin of the Atomic Scientists*, 2011, <http://www.thebulletin.org/web-edition/columnists/fissile-materials-working-group/after-bin-laden-nuclear-terrorism-still-top-t>.

5. Guy Faulconbridge and Steve Gutterman, "Russia Says Terrorists Seeking Nuclear Materials," Reuters, June 2, 2010, <http://www.reuters.com/article/2010/06/02/us-russia-security-nuclear-idUSTRE6512RQ20100602>.

there is no state sponsorship of the transfer, the transfer is not deliberate, and the state is not complicit in the transfer.

Figure 1. Framework for Dynamic Source-Pathway Transfers of Nuclear Materials from State to Nonstate Entities



Source: S. A. Dewji and A. N. Stulberg, "Is Nuclear Forensics an Effective Deterrent against Nuclear Smuggling and Terrorism?" paper presented at 51st Annual Meeting of the Institute of Nuclear Materials Management, Baltimore, July 11–15, 2010

The pathways by which rogue or nonstate actors can acquire nuclear material continue to evolve and change as rogue and nonstate actors are continually finding innovative approaches and smuggling routes, reminiscent of conventional criminal smuggling (drug/arms/human trafficking) activities. There are four main types.⁶

The first type is state-to-state transfer (overt/covert). This can be completed either via a technology or material sale or transfer overtly from state to state, or covertly from state to state. In such cases, the transfer of material is complicit. This situation would be typical of a rogue state transferring material to another state. An example of overt proliferation activities includes the transfer of nuclear technology from North Korea proliferating to Syria.⁷

The second type is transfer from state to nonstate actors (overt/covert). This situation entails the complicit transfer of nuclear materials or technology to a nonstate party. Such a situation could occur if, for example, al Qaeda offered to pay Kim Jong-il for the purchase of nuclear material or a nuclear weapon that could be used against the United States.⁸ A rogue state could also employ any nonstate terrorist actor to covertly attack the

6. Ibid.

7. Louis Charbonneau, "U.N. Sees North Korea Exporting Nuclear Technology—Envoy," Reuters, May 28, 2010, <http://uk.reuters.com/article/2010/05/28/uk-korea-north-nuclear-undUKTRE64R0ZQ20100528>.

8. Graham Allison, "How to Keep the Bomb from Terrorists," *Newsweek*, March 23, 2009, <http://www.thedailybeast.com/newsweek/2009/03/13/how-to-keep-the-bomb-from-terrorists.html>.

United States, such that the blame is diffused to the nonstate actors and the state sponsor could claim victimization.

The third type is transfer from state to nonstate actors (tacit). The fall of the Soviet Union has left multiple sites of nuclear material unsafeguarded, and these areas have thus become a hub for security leaks and the smuggling of nuclear material into Europe. Such states with weak physical protection of their nuclear material are focal points for nuclear smuggling. These states possess a weak capacity for the physical security of their nuclear material and may be prone to inadvertent transfers to undesirable actors.

And the fourth type is transfer from state to state (tacit) to a rogue state / nonstate. As an extension of the previous point, smuggled material could proliferate through various routes (like Dubai, reminiscent of the A. Q. Khan network) that could reach nonstate and also rogue state actors. This path implies a more complex and constantly evolving dynamic of such activities. In the case of rogue states acquiring material through explicit state-to-state transfer, traditional deterrence has proven steadfast. This is reminiscent of George W. Bush's statement in October 2006 that the United States would hold North Korea "fully accountable" for the consequences of any transfer of nuclear materials or weapons from Pyongyang.⁹

The Evolution of Deterrence

The operating principle underlying deterrence is to prevent a proscribed hostile act by ensuring that the risk of undertaking this act outweighs the benefits in the purview of consequences, as perceived by the adversary. The evolution of traditionally deterring one state actor during the Cold War has since been transformed into deterring multiple actors, both state and nonstate.

The Cold War Revisited

Deterrence has become a trademark of 20th-century Cold War policy. Traditional nuclear deterrence theory was a product of the Cold War strategy based upon the concept of mutually assured destruction (MAD), whose premise is that if one nuclear state attacked another nuclear weapons-armed state, retaliation by the opposing state would ensure that both states would suffer severe devastation. Thus, the outcome of such a strategy would be that neither of the opposing states would undertake the proscribed action, and hence they would avoid a direct nuclear conflict. However, the operational basis of deterrence during the Cold War was based on a state's capability and willingness to carry out a retaliatory strike. If the aggressor believed that it would suffer prohibitive consequences, then it would have little incentive to initiate a first strike. In relation to a forensics-based deterrence regime, MAD was predicated on the notion that the provenance of weapons could be ascertained such that retributive action could be taken. And because the retributive response would incur unacceptable losses, MAD then applies

9. Sidney Niemeyer and D. K. Smith, "Following the Clues: The Role of Forensics in Preventing Nuclear Terrorism," *Arms Control Today*, July 8, 2007, http://www.armscontrol.org/act/2007_07-08/Clues.

and the initial proscribed action will not be undertaken. Yet, if a nonstate actor was to undertake the proscribed action, forensics may be useful in broadly identifying state provenance, though prosecution would only be effective against states whose behavior was complicit.

Traditional deterrence theory is not a monolith, but instead has historically evolved to subsume two distinct forms: *deterrence by punishment* and *deterrence by denial*.¹⁰ Adversaries can be threatened with unacceptable consequences if attempts are made to achieve their aims by force (punishment), or by preventing them from doing so (denial). Deterrence by punishment involves threatening to impose proportional costs if the adversary undertakes the proscribed act (a first-strike nuclear attack). Deterrence by punishment was the operative principle in the MAD approach to deterring the Soviet Union. Deterrence by denial operates by reducing the probability of success and hence the benefits gained from committing the proscribed act. This strategy may involve multiple lines of defenses that test the adversary's resolve. Deterrence during the Cold War was predicated on the threat of punishment, whereas contemporary applications are predicated on denial—denying the benefits of hostile action—along with punishment.

Because terrorists lack a return address, deterrence by punishment seems decreasingly effective, and thus it is more credible to pursue a deterrence-by-denial approach as a primary strategy. However, both strategies pose unique prospects when applied overall to the threat of nuclear terrorism.

Tailored Deterrence in the 21st Century

With the evolution of 21st-century threats by advanced military powers, rogue states, and nonstate/terrorist networks, the traditional “one-size-fits-all” approach to deterrence must evolve to fit the volatile security environment. Scholars such as R. F. Tager and D. P. Zagorcheva have argued that traditional strategies of deterrence can be ineffective against ideologically motivated terrorists who do not fear punishment and lack a return address for any retribution.¹¹ Terrorist groups such as nonstate actors thus represent an asymmetric threat. Deterrence is only effective when the adversary perceives that a threat of retribution is both credible and feasible. Even though increased state liability may shift the paradigm toward greater accountability, it may shift such accountability away from the terrorist actors. Consequently, this may not deter terrorist capabilities or motivations. M. E. Bunn states that, in essence, deterring terrorists may be perceived as an oxymoron.¹² However, Bunn observes that this view has since evolved from its initial conceptions to where it is now being ascertained “whether there may be ways to deter various parts of terrorist networks, consider the requirements of extended deterrence in

10. Glenn Snyder, *Deterrence by Denial and Punishment* (Princeton, N.J.: Princeton University Press, 1958).

11. R. F. Trager and D. P. Zagorcheva, “Deterring Terrorism: It Can Be Done,” *International Security* 30, no. 3 (2006): 87–89.

12. M. E. Bunn, “Can Deterrence Be Tailored?” *Strategic Forum*, January 2007, <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA463735&Location=U2&doc=GetTRDoc.pdf>.

the evolving security environment: how to assure allies and friends that the United States will meet its security commitments to them rudimentary.”¹³

The 2002 *National Security Strategy* has obviated the strategic need for a transformation of deterrence theory to address contemporary asymmetric threats, asserting that “traditional concepts of deterrence will not work against a terrorist enemy whose avowed tactics are wanton destruction and the targeting of innocents; whose so-called soldiers seek martyrdom in death and whose most potent protection is statelessness.”¹⁴

In the 2006 *Quadrennial Defense Review (QDR)*, the Bush administration introduced the concept of *tailored deterrence*, shifting away from the “one-size-fits-all” traditional approach. Tailored deterrence introduced a more customizable approach to 21st-century challenges, while assuring allies and dissuading potential competitors.¹⁵ However, with the introduction of a new wave of deterrence strategy, critical questions have arisen: “How does *tailored deterrence* differ from previous strategies? Whom is the United States trying to deter, from doing what, and in what circumstances? . . . How should capabilities be tailored for deterrence? How can the United States tailor deterrence when . . . messages tailored to one audience will be received by all?”¹⁶

The 2010 *QDR* set forth by the Obama administration builds upon the concept of tailored deterrence initially proposed in the 2006 *QDR*, articulating what a credible tailored deterrence approach demands: “Such tailoring requires an in-depth understanding of the capabilities, values, intent, and decision making of potential adversaries, whether they are individuals, networks, or states.”¹⁷ The 2010 *QDR* even introduces the concept of *hybrid* approaches, encompassing the complexity of conflicts, the diversity and multiplicity of actors, and the distortion of traditional categories of conflict.¹⁸

A “New Type” of Deterrence

Unlike conventional terrorism, which is often autonomous, nuclear terrorism requires that states or substate military organizations must be involved in the tacit or complicit provision of nuclear materials. Nuclear terrorism unequivocally requires the assistance of a state facility to obtain nuclear material, whether through an active transfer from a state to nonstate actor, or passively via theft, trafficking, or a lax regard for nuclear material security. This state-based requirement for the supply for nuclear materials has been the focal point of efforts to instill a renewed deterrence policy against nonstate actors engaging in nuclear terrorism.

13. Ibid.

14. George W. Bush, *National Security Strategy of the United States of America* (Washington, D.C.: White House, 2002), 15.

15. U.S. Department of Defense, *Quadrennial Defense Review, 2006* (Washington, D.C.: U.S. Government Printing Office, 2006), 49.

16. Bunn, “Can Deterrence Be Tailored?”

17. U.S. Department of Defense, *Quadrennial Defense Review, 2010* (Washington, D.C.: U.S. Government Printing Office, 2010), 14.

18. Ibid., 8.

During his last term as senator from Delaware, Joe Biden advocated this “new type of deterrence” in a June 2007 article “CSI: Nukes,” published in the *Wall Street Journal*:

To bring deterrence into the 21st century, . . . the United States and other potential targets of nuclear terrorism must take advantage of nuclear terrorists’ reliance on states. . . . The U.S. has long deterred a nuclear attack by states, by clearly and credibly threatening devastating retaliation. Now is the time for a new type of deterrence: We must make clear in advance that we will hold accountable any country that contributes to a terrorist nuclear attack, whether by directly aiding would-be nuclear terrorists or willfully neglecting its responsibility to secure the nuclear weapons or weapons-usable nuclear material within its borders. Deterrence cannot rest on words alone. It must be backed up by capabilities. . . . Deterrence based on strong nuclear forensics is a critical tool to help prevent nuclear terrorism. To prevent a nuclear 9/11, we must use every tool we have.¹⁹

To solidify the commitment to developing a nuclear forensics-based deterrent, President Obama commissioned the Nuclear Forensics and Attribution Act in February 2010, legislation intended to reinforce domestic technical expertise in nuclear forensics in efforts to deter nuclear terrorism.²⁰ The Obama administration’s commitment to forensics-based deterrence was explicitly reinforced in the 2010 *QDR*:

Improving our ability to attribute nuclear threats to their source can help deter aggressors from considering the use of nuclear weapons, as well as deter state and nonstate actors that may provide direct or indirect support of nuclear terrorism. . . . Research is underway to identify new means by which we can arrive more quickly at reliable technical nuclear forensic assessments. Improving the ability to determine the source of material used in a nuclear attack will strengthen deterrence.²¹

Although the current administration has made strong commitments toward garnering nuclear forensics expertise, capabilities offered by forensics as a deterrent to nuclear terrorism reveal disparities in political rhetoric, strategic expectations, and technical capabilities. Such disparities must be scrutinized in order to ascertain the credibility of a forensics-based regime.

What Can Nuclear Forensics Do, Technically?

Nuclear forensics employs analytical tools to characterize and attribute nuclear materials from either the interception of raw materials or from radioactive debris following a nuclear detonation. With either an intercepted or a postdetonation sample, the source can be determined, or at least narrowed down, by analyzing material properties. All nuclear material possesses physical, chemical, elemental, and isotopic signatures. Elemental signatures derive from reprocessing techniques using chemical compounds and isotopic signatures are derived from material enrichment or reactor burn-up. The material

19. Joe Biden, “CSI: Nukes,” *Wall Street Journal*, June 4, 2007.

20. “Nuclear Forensics and Attribution Act,” 111th Cong., 2d sess., February 16, 2010, http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_cong_public_laws&docid=f:publ140.111.pdf.

21. U.S. Department of Defense, *Quadrennial Defense Review, 2010*, 36.

characteristics indicate the unique underlying processes to which this material was exposed, and because each nuclear state possesses distinct source materials and industrial processes, the material's signature provides a fingerprint that can possibly determine its provenance. When combined with traditional forensics, law enforcement and intelligence, nuclear forensics contributes to the overall attribution process by attempting to discern the material's movement, industrial processes, and last legal owner.

The science underlying nuclear forensics is not new; the technical methods were developed and exercised during the Cold War to determine the location, type, and yield of Soviet nuclear weapons tests. However, this research stagnated once nuclear testing went underground during the 1960s, but has more recently been employed to determine the characteristics of the North Korean nuclear bomb test in 2006.²² The U.S. attribution program was initiated in 1999, and publicized in 2006 with the launching of the National Technical Nuclear Forensics Center.²³ Issues in nuclear forensics have more recently gained momentum in the technical, policy, and operational communities, as all are optimistic about the United States' technical capabilities to trace the provenance of intercepted or postdetonation nuclear material.²⁴

The Strategic Implications of Forensics-Based Deterrence

For the deterrent threat to be credible in the eyes of rogue state and nonstate actors via the employment of nuclear forensics, subscribing states must exhibit a sequence of capabilities. First, subscribing states must exhibit a defined commitment to execute an attribution-based nuclear forensics capability. Subsequently, the state must be able to communicate this defined commitment in a credible arena. Next, states must possess a definitive capability through which an attribution-based forensics regime can be actuated. Finally, subscribing states must possess the resolve to take action based on their commitments and capabilities.

Deterrence by Denial in Predetonation Scenarios

Predetonation attribution is valuable when raw nuclear material is intercepted along a smuggling or trafficking route. Employing forensic techniques can assist in determining the source of the material, identify possible physical security comprises, and perhaps prevent additional trafficking that may lead to the future acquisition of nuclear materials by terrorists. More than 50 incidents of nuclear material trafficking are reported each year.²⁵ The smuggling of nuclear material, especially from the former Soviet Union states, has become a key target, because these states possess one of the world's largest

22. J. Kang, F. N. von Hippel, and H. Zhang, "The North Korean Test and the Limits of Nuclear Forensics (Letter to the Editor)," *Arms Control Today*, January–February 2007.

23. U.S. Department of Homeland Security, "National Technical Nuclear Forensics Center," http://www.dhs.gov/xabout/structure/gc_1298646190060.shtm.

24. M. Miller, "Nuclear Attribution as Deterrence," *Nonproliferation Review* 14 (2007): 39–60.

25. International Atomic Energy Agency, "Illicit Trafficking Database," <http://www-ns.iaea.org/downloads/security/itdb-fact-sheet.pdf>.

stockpiles of fissile material. Since the fall of the Soviet Union, these stockpiles have remained poorly guarded, both physically to external threats and internally against insider threats.

Forensics in a predetonation interception scenario is the cornerstone for establishing a deterrence-by-denial strategy against nuclear trafficking and smuggling. Denial measures propose to increase the cost of the proscribed action in ease of acquisition, financial resources, personal security, and decreasing chances of success.²⁶ Deterrence-by-denial strategies hedge on their abilities to alter the perception of terrorists by portraying an increasing degree of challenge, and thus to dissuade actors from taking the proscribed action.

Proponents of a predetonation deterrence strategy seek to establish a global norm emphasizing that nuclear material accountability rests with states. Predetonation attribution would reinforce the idea that a state should be forced to implement physical protection measures if any material escapes its domestic control, or otherwise face being internationally ostracized and stigmatized. In this regard, it has been suggested that both negligent and/or rogue proliferating states would be met with enmity. The conventional elaboration of this “preventive” deterrence-by-denial strategy hedges on the premise that a terrorist group may be deterred from pursuing nuclear terrorism if it believed chances of failure were high enough. The push toward state stewardship may enhance the denial strategy, but this may not be sufficient to dissuade a highly resourceful and motivated nonstate group.

Deterrence by Punishment in Postdetonation Scenarios

Nuclear attribution in a postdetonation scenario employs a deterrence-by-punishment strategic approach such that the originating state for the detonated material would ultimately be held responsible and would be met with retributive action, regardless of whether a nonstate actor was the intermediary delivering the attack. The impetus behind such a strategy is that it would force negligent states to secure their nuclear material or otherwise face collateral retribution, in a way reminiscent of the Cold War MAD paradigm.²⁷ Assured punishment in such cases has remained the basis of credible deterrent strategy.

Given the possibility of rogue states transferring nuclear technology and materials, such as states like North Korea, a deterrence-by-punishment strategy may be more effective against rogue state actors than nonstate actors. Noncomplying states commonly viewed as ambiguous or rogue have currently cited Iran and North Korea as possible threats. However, the intent and capabilities of Iran’s program are still uncertain and are still under intense scrutiny by the International Atomic Energy Agency. North Korea has presented itself as a menacing nuclear power and was already suspected of transferring

26. M. J. Powers, *Deterring Terrorism with CBRN Weapons: Developing a Conceptual Framework*, Occasional Paper 2 (Washington, D.C.: Chemical and Biological Arms Control Institute, 2001), 13–19.

27. Anders Corr, “Nuclear Terror and the Blind-Side Attack: Deterrence through Nuclear Tagging,” <http://www.people.fas.harvard.edu/~corr/cv.htm>.

nuclear technology to Syria.²⁸ The internal politics of Pakistan make it a prime state that would pose a global security risk in the event of its collapse. This potential scenario is evident, as terrorist organizations have been increasingly seeking refuge in Pakistan as an outflow from Afghanistan. Preventive security measures must be taken to ensure that nuclear material is secured against internal politics.

If punitive action by the international community were to be threatened against a negligent actor, a paradigm shift in material accountancy norms might ideally be realized. However, from a practical perspective, the main countries that would bear the brunt of such a backlash would undoubtedly be those that suffer the highest reported smuggling and trafficking incidents—for example, the former Soviet states, including Russia. For instance, if al Qaeda smuggled material from Russia and/or used it to make an improvised nuclear device, would the international community, led by the United States, demand military retribution from Russia’s loosely guarded stockpile? The results of such an action would be detrimental to spirit of the Cooperative Threat Reduction Program, in addition to strategic arms reductions efforts and other bilateral arrangements between the United States and Russia. In this case, retaliation or condemnation would not be an effective diplomatic tool of statecraft in enforcing material security but would further undermine bilateral efforts.

A Tailored Deterrence Strategy for Nuclear Forensics

In an alternative case, would the United States feel so sentimental toward a country like Pakistan if nuclear material was smuggled into terrorist hands? Is it credible that the United States would not retaliate against Pakistan? Although diplomacy and statecraft operate dynamically rather than on a level playing field, will a nuclear terrorism deterrence strategy coddle American allies and castigate others? If so, this strategy may even force terrorists to deliberately seek material from Russia more than Pakistan, because the operating conditions may be less severe if Russia is caught and claims victimization.

The optimal strategy is one that prevents hostile acts rather than complacently permits and penalizes them later. Punishment and retaliation must occur against the non-state elements in order to deter their motivations and increase the fear of punishment. Although ideological nonstate groups may not fear punishment, and additionally lack a return address for direct retribution, punitive measures must come from law enforcement in identifying and thwarting any potential attempts. In addition, preemptive law enforcement measures must be directed at nonstate elements in order for a deterrence-by-punishment strategy to be effective. The call for a deterrence-by-punishment strategy against states for the actions of nuclear terrorists must be less draconian and requires a more credible response by the international community. Thus, for both deterrence strategies to be successful in addressing contemporary threats, “two conditions must hold: The threatened party must understand the (implicit or explicit) threat, and decisionmaking by the adversary must be sufficiently influenced by calculations of costs and benefits.”²⁹

28. Charbonneau, “U.N. Sees North Korea Exporting Nuclear Technology.”

29. Trager and Zagorcheva, “Deterring Terrorism,” 91.

The application of a customized tailored deterrence strategy must incorporate a mélange of both nuclear and conventional capabilities, and of aimed state and/or nonstate actors. Consequently, nuclear forensics provides a limited deterrent against nonstate actors, though operates more robustly in a deterrence-by-denial strategy than a deterrence-by-punishment strategy, which better operates in enforcing state liability for nuclear material security leaks.

Uncertainty and Deterrent Credibility: Challenges to the Forensics Regime

Although nuclear attribution is a critical component in assuring credible retribution, employing forensics as the foundation for a deterrence strategy requires tackling strategic and also legal and political obstacles. Emphasis on the gravity of technical, legal, and political burdens varies with each deterrence and detonation scenario. Proponents of nuclear forensics have yet to consider the diplomatic aspects of this renewed deterrence policy, especially resolving how technical uncertainties affect the attribution process underlying the deterrence strategy. To establish the burden of proof, pinpointing the source state would require high levels of uncertainty, such that retributive actions would not be erroneously conducted. However, evidence may be less than unequivocal, and nuclear forensics is better suited to being pursued in tandem with other law enforcement and intelligence techniques as a method to utilize a process of elimination, rather than for definitive identification. Between the predetonation and postdetonation strategies, the balance among the technical, legal, and political incentives for action will vary.

In a predetonation scenario, a premium has been placed on employing a deterrence-by-denial strategy. However, this credibility hinges on a proponent having the detection and intelligence capability to interdict material. With interdicted smuggled material, there is a much stronger legal and technical burden to be met, vis-à-vis the political incentives associated with nuclear material security. However, metrics must be established for not only the technical but also the legal burdens of proof that must be met in order to hold a state accountable, and before acting politically against the infracting state. Yet, for both the legal and technical aspects, it must still be determined how much uncertainty is enough to solicit a retributive response. Conversely, in the postdetonation scenario where deterrence has seemingly failed, it is credible to believe that if a state has already incurred losses, then it will certainly be more likely to incur a retaliatory response. In such a case, the political incentives may outweigh the technical and legal burdens, and the standards for acting will thus have decreased because the damage has already been done.

Assessing risk and uncertainty may lead states to subscribe to a global nuclear forensics effort in order to have an active role as participants. In addition, states with opaque motives may be reluctant to subscribe to such efforts because it may prematurely put rogue/adversarial states as prime suspects. Yet it seems that these states would be the most desirable to subscribe to this regime, though would be least likely to do so. Thus,

the challenge remains as to what would incentivize states to cooperate. A dichotomy remains: Would the threat of punishment deter cooperation?

What becomes a pending issue in such a scenario is then to determine whom to retaliate against. With such disproportionate participation, it may be difficult to determine states with deferring motives from those that may feel victimized, or even those that do not wish to admit or share aspects of their nuclear program. If states with a weak capacity are able to claim victimization, then the burden of proof becomes quite arduous in establishing state intent. In a situation where all states are equally culpable, regardless of intention, this may undermine a cohesive effort at establishing a global regime with the additional risk of incurring blame and accordingly having to suffer the consequences. A further dichotomy exists between culpability and intent, in such cases, and remains a challenge in a forensics-based deterrence regime.

Recommendations

Proponents of nuclear forensics must realize that employing forensic technology alone will not deter nuclear terrorism, but must work in tandem with global intelligence and law enforcement efforts. Forensics should not be overplayed as deterrent activity, confusing attribution with retribution. This strategy may hold states ultimately culpable for the movement of their nuclear material, but is a far cry from deterring terrorists, as any state-based retaliation would diffuse the punishment away from the nonstate organization or individuals. To be effective, this strategy must affect supply and demand segments, as well as the intermediaries that actuate such initiatives. Failure to do so will result in a strategy that diffuses blame away from the specific transgressing actors, and does not discourage nonstate incentives. Because terrorist groups have proven themselves to be very dynamic and resourceful, they could easily shift operations to areas where the global community lacks intelligence on material security. States are obviously not vindicated in this situation, but must weigh the consequences of retribution due to a lack of cooperation.

Although nuclear forensics is a critical component in assuring the credibility of retribution, employing forensics as the foundation for a deterrence strategy requires tackling strategic along with legal and political obstacles. In addition to law enforcement and intelligence cooperative strategies, the success of a nuclear forensics deterrence strategy rests on three fundamental pillars: (1) expanding the range of deterrable actors beyond states; (2) a paradigm shift in international cooperation regarding nuclear material security; and (3) multilateral technical cooperation, including the development of a comprehensive fingerprint database of nuclear material signatures.

Expanding the Range of Deterrable Actors

Numerous undesirable actors exist in a nonstate nuclear plot, in addition to some that could be deterred on the margins, while most important actors (states) are arguably already deterred. If the subscribing states are able to broaden the range of actors they are able to deter, then they will be more likely to reduce the likelihood of an attack. Three

types of actors are required to commit an act of nuclear terrorism.³⁰ The first is a terrorist group itself, which comprises cells of ideologically motivated individuals that are part of a complex nonstate organization.³¹ The second is the supplier state, which operates overtly, covertly, or tacitly. And the third are the intermediaries to provide transportation, funding, and shelter for covert activities, in addition to the specialists/expertise solicited for a nuclear operation. The terrorist group itself is largely ideologically motivated, and as outlined above, is exceedingly difficult to deter if it often does not fear punishment or retribution. States are already deterred by other states based upon the premise of MAD, also as discussed above. However, the latter group is increasingly likely to be financially motivated, and must be targeted and deterred. Deterring financial sources to terrorism will certainly present a definitive obstacle in would-be nuclear terrorists, given that nuclear material is extremely costly.

Performance-Based Security for Nuclear Material

The international community has, thus far, not created a binding strategy for performance based on material accountancy and the physical protection of nuclear and radiological material. The only internationally agreed-upon standard regarding nuclear material security was the UN Security Council Resolution 1540, which requires all states to establish domestic controls to prevent the proliferation and delivery of nuclear (and also chemical and biological) weapons.³² However, this qualitative standard is left open to interpretation and leaves material security at the discretion of the state. Yet since its establishment in 2004, there has been no perceptible drop in reported nuclear trafficking incidents according to the International Atomic Energy Agency's (IAEA's) Illicit Trafficking Database, and challenges in discerning trends remain, because temporal lags in data reporting and classification are inherent to this database.³³

Advocates of nuclear forensics have recommended that governments make greater investments in their forensics capability as a means of quantifying the metrics associated with Resolution 1540.³⁴ Given that actors can be motivated by diligence or a sense of urgency, especially pending security threats—and can be motivated internally by terrorists; externally by terrorists; or externally by international condemnation, sanctions, or

30. Joint Working Group of the American Physical Society and the American Association for the Advancement of Science, *Nuclear Forensics: Role, State of the Art, Program Needs* (Washington, D.C.: AAAS Center for Science Technology and Security Policy, 2008).

31. C. D. Ferguson and W. C. Potter, *Four Faces of Nuclear Terrorism* (New York: Routledge, 2005).

32. United Nations Security Council, “Resolution 1540: Non-Proliferation of Weapons of Mass Destruction,” United Nations, 2004, <http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N04/328/43/PDF/N0432843.pdf?OpenElement>.

33. International Atomic Energy Agency, “Illicit Trafficking Database,” <http://www-ns.iaea.org/downloads/security/itdb-fact-sheet.pdf>.

34. Niemeyer and Smith, “Following the Clues”; Debra K. Decker, *Before the First Bomb Goes Off: Developing Nuclear Attribution Standards and Policies*, Belfer Center Discussion Paper 2011-03 (Cambridge, Mass.: John F. Kennedy School of Government, Harvard University, 2011).

military action by the international community—an eclectic approach must be taken in promoting and enforcing new material accountancy norms. A hawkish stance in the face of retribution or international condemnation in conjunction with a dovish stance in the spirit of international cooperation are simultaneously required to ensure adherence to nuclear material security policy.

Because the IAEA plays a paramount in safeguards, George Bunn has suggested that it be tasked with a more authoritative role in verifying state compliance with UN Security Council Resolution 1540, and prescribed that inspectors should additionally examine the state's physical protection during routine inspections.³⁵ However, Chivers and colleagues believe that states would not complacently permit an external review of its military and nuclear security procedures.³⁶ In addition, military facilities in existing nuclear weapon states do not fall under the jurisdiction of IAEA safeguards. Chivers and colleagues maintain that with the assistance of forensics to identify problematic states with material security leakage, such states may invoke the assistance of the IAEA to review their security practices in hopes of preventing future security compromises.

Multilateral Technical Cooperation

A common recommendation across various nuclear forensics analyses is that there should be a comprehensive database containing nuclear material signatures and samples.³⁷ Such a database has been heralded as the ideal basis upon which any credible attribution strategy against nuclear smuggling and terrorism would rely. The creation of a database would be extremely limited in an attribution capacity, and thus requires the signatures of countries with weapons and fissile material worldwide. Such a database would still be met with resistance, even if information security concerns were remedied by incorporating both encrypted classified and public components of the database. The ultimate motivation to encourage participation in such endeavors is that database participants would be ensured the ability to voice their concerns in a situation where political or military retaliatory strikes are possible or likely. Even if states subscribed to this forensics database, critical questions would first need to be addressed, such as who would undertake the authentication and analysis for sample entry into the database, how nuclear data would be shared by database participants, and what nuclear data characteristics would be shared in multilateral agreements.³⁸

Even if states decline to participate in an international database for obvious political reasons, this does not preclude the technical community from establishing the criteria for forensic analysis. Technical experts can begin to determine what information must be explicitly available in a forensics database and should at a minimum agree on what type of information is relevant in establishing a forensics regime. If the technical community

35. George Bunn, "Enforcing International Standards: Protecting Nuclear Materials from Terrorists Post 9/11," *Arms Control Today*, January–February 2007, 14–17.

36. D. H. Chivers, B. F. Lyles-Goldblum, B. H. Isselhardt, and J. S. Snider, "Before the Day After: Using Pre-Detonation Nuclear Forensics to Improve Fissile Material Security," *Arms Control Today*, July 8, 2008, http://www.armscontrol.org/act/2008_07-08/NuclearForensics.

37. M. M. May, J. Davis, and R. Jeanloz, "Preparing for the Worst," *Nature*, 2006, 907–908.

38. Miller, "Nuclear Attribution as Deterrence."

is able to justify the reasons that it requires certain information from states, requests to gain access to such information may be met with less ambivalence.

Conclusions

Although increased nuclear material accountancy is the outcome of a forensics regime, which in turn may deter terrorist motivations to seek nuclear material, many multilateral cooperation challenges, in addition to insider security threats, must be addressed. From a legal perspective, nuclear forensics requires long timelines for technical attribution, and may be somewhat time consuming compared with law enforcement timelines or the timelines sought for retribution or to plug urgent security leaks. In addition, forensics may optimistically only be able to narrow the number of possible sources.

The strategic relevance of nuclear forensics is that its capabilities assist in determining the provenance of intercepted material employed in a predetonation scenario and also attributing postdetonation debris back to its state of origin through a process of elimination. Deterrence strategy hedges on the adversary's perception that a retributive threat is not only credible but also feasible. The credibility of an assured response is an operative feature of deterrence, for the adversary must perceive that a punitive capability is possible, imposing costs on proscribed actions to deny the benefit. Communication of a forensics attribution capability assists in ensuring the credibility of the deterrence threat. The threat of retaliation against a state acting in good faith to prevent theft may produce a counterproductive response, thus necessitating cooperation as a more effective policy. However, in the absence of multilateral cooperation and a comprehensive forensic database, the credibility of the deterrent threat offered by a nuclear forensics capability is undermined. Although this process has inherent limitations, a deterrence strategy against nonstate actors using nuclear forensics, at present, has proven to be a challenge of multilateral political cooperation. Technical capabilities alone will not provide a panacea for the basis of a deterrence regime, because technology is only as effective as the political regime in which it operates.

Signals Intelligence? The Effectiveness of Nuclear and Nonnuclear Signals in a Crisis

Rebecca Davis Gibbons

The 2010 Nuclear Posture Review repeats the conventional wisdom that nuclear bombers add value to the U.S. arsenal by providing a means to credibly signal to adversaries during conflict. By examining 15 historical cases of U.S. nuclear signaling during periods of crisis, this paper seeks to explore two assumptions: that nuclear signaling is effective in a conflict, and that bombers are the best means of signaling. Preliminary evidence indicates that nuclear signaling in a crisis is not often effective and that when it has been effective, it has involved a combination of rhetorical threats and weapons movement. Findings suggest that policymakers should be wary of assuming that nuclear signaling will end a conflict because this signaling has often not worked as intended.

Introduction

In the fall of 1969, President Richard Nixon secretly ordered an increase in nuclear readiness to send a message to the Soviets that the United States would escalate the Vietnam War. Eighteen nuclear-armed B-52 bombers took off from the West Coast and flew close to the Soviet Union in oval patterns.¹ Nixon hoped that this signal would cause the Soviet Union to pressure North Vietnam to end the conflict. There is little evidence, however, that this signal altered Soviet policy.²

Nuclear-armed bombers are, of course, not the only means used to signal in the era of nuclear weapons. In 1958, the Dwight Eisenhower administration publicized tactical nuclear weapons tests to signal U.S. resolve to the Chinese over the conflict in the Taiwan Strait. In 1990, President George H. W. Bush issued a written threat implying possible nuclear use to deter Saddam Hussein of Iraq from deploying chemical and biological weapons against U.S. soldiers during the Gulf War. Despite the variety of means

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1. Scott Sagan and Jeremi Suri, "The Madman Nuclear Alert: Secrecy, Signaling, and Safety in October 1969," *International Security* 27, no. 4 (Spring, 2003): 150–183.

2. Fredrik Logevall and Andrew Preston, *Nixon in the World: American Foreign Relations, 1969–1977* (Oxford: Oxford University Press, 2008), 137.

by which leaders can signal nuclear intent in a crisis, an assumption of U.S. national security policy, spelled out in the U.S. Department of Defense's *2010 Nuclear Posture Review*, is that the bomber leg of the triad can be used to credibly communicate intentions to allies and adversaries.³

This paper seeks to better explain signaling in practice by studying historical examples of U.S. nuclear signaling. Specifically, the paper explores whether signaling with nuclear weapons has been effective, and if so, how the success of a signal is linked to the type of signal transmitted. In some cases, nuclear signals are issued as purely rhetorical threats, while in others nuclear weapons provide more explicit threats via their relocation to a new theater or their placement on higher alert. Sometimes a leader does both. High-level Department of Defense documents and the works of military scholars often present the bomber as important because of its signaling capability in a crisis.⁴ The evidence suggests, however, that nuclear signaling has rarely worked and that bombers have rarely been sufficient signaling devices in conflict.

The paper begins with a brief review of Cold War-era and post-Cold War era scholarship on signaling. It then explains the methodology and selection of cases, before summarizing the findings about the efficacy of signaling. The paper concludes with lessons drawn from an examination of 15 cases of U.S. nuclear signaling.

Background

Robert Jervis defines signals as “statements or actions the meanings of which are established by tacit or explicit understanding among actors.” They are “issued mainly to influence the receiver’s image of the sender.”⁵ Signaling to other nations occurs in many areas of foreign policy. This study is limited to a subtype of signaling—nuclear crisis signaling. Crisis signals are statements or actions aimed at threatening an adversary as a means of deterring or compelling a particular action during a period of “extraordinary military tension.”⁶

During the Cold War, many strategic thinkers grappled with the challenge of credible signaling. Thomas Schelling contemplated the difficulty of persuading an adversary that a threat of force is credible, and not a bluff, in both *The Strategy of Conflict* (1960) and *Arms and Influence* (1966). Jervis used some of the insights from Schelling’s work in *The Logic of Images in International Relations* (1970), a book-length theoretical examination of the means by which states can influence others through affecting their own

3. U.S. Department of Defense, *2010 Nuclear Posture Review*, 24, <http://www.defense.gov/npr/docs/2010%20Nuclear%20Posture%20Review%20Report.pdf>.

4. See, e.g., *ibid.*; and David Baylor, “Considerations for a US Nuclear Force Structure below a 1,000-Warhead Limit,” *Strategic Studies Quarterly*, Summer 2011, 68.

5. Robert Jervis, *The Logic of International Relations* (Princeton, N.J.: Princeton University Press, 1970), 18.

6. P. Stuart Robinson, *The Politics of International Crisis Escalation: Decision-Making under Pressure* (London: I. B. Taurus, 1996), 1. In this paper, I use *threat* and *signal* interchangeably from this point on.

image. These early works provide much of the theoretical foundation on which subsequent nuclear signaling research rests.

Beyond theory, some early work qualitatively examined cases of deterrent threats. In their 1974 work, Alexander George and Richard Smoke evaluated deterrence in 11 case studies of limited conflict during the Cold War. In this classic study, they find that abstract deterrence theory is insufficient in explaining deterrence in practice. They conclude that policymakers require a broader theory of influence when it comes to making threats because the threats used to signal “are often irrelevant or dysfunctional.”⁷ In another seminal tome from the Cold War, Glenn Snyder and Paul Diesing find that the chances of messages getting through “untarnished” from one government to another are two in five.⁸ Of previous Cold War studies, the one most similar to this study is Richard Betts’s 1987 *Nuclear Blackmail and Nuclear Coercion*. Betts’s goal was to “compile and compare” all attempted cases of nuclear coercion with a focus on the American government’s decisionmaking process.⁹ Betts primarily examines the decisionmaking process surrounding nuclear threats, concluding that presidents were not prepared for the consequences of failed threats and that nuclear superiority did not have as much impact on U.S. leaders (and their willingness to make threats) as had been previously thought.¹⁰

The recent literature on this topic had mainly utilized game theory and statistical models to explore the role of nuclear weapons and crisis outcomes. The game theory strand has mainly focused on how state leaders can credibly illustrate their resolve in order to prevent a conflict. This research, which encompasses all types of signaling, is based on James Fearon’s notion that war is a bargain in which each of the participating states has imperfect information.¹¹ If states were to have perfect information—including insight into the resolve of the adversary—then conflicts could be settled before erupting into war. Fearon suggests that audience costs promote the credibility of threats and that democratic leaders face higher audience costs for making false commitments and thus are better able to credibly signal to adversaries.¹² He also compares the costliness of signals in which leaders have tied their hands through public commitment with that in which leaders have “sunk costs” by mobilizing troops. He finds that in his models leaders do better on average by tying hands through rhetoric.¹³

7. Alexander L. George and Richard Smoke, *Deterrence in American Foreign Policy: Theory and Practice*, (New York: Columbia University Press), 507.

8. Glenn Snyder and Paul Diesing, *Conflict among Nations: Bargaining, Decision Making, and System Structure in International Crises* (Princeton, N.J.: Princeton University Press, 1977), 318.

9. Richard Betts, *Nuclear Blackmail and Nuclear Coercion* (Washington, D.C.: Brookings Institution Press, 1987).

10. *Ibid.*, 213–214.

11. James D. Fearon, “Rationalist Explanations for War,” *International Organization* 49, no. 3 (1995): 379–414.

12. James D. Fearon, “Domestic Political Audiences and the Escalation of International Disputes,” *American Political Science Review* 88, no. 3 (1994): 577–592.

13. James D. Fearon, “Signaling Foreign Policy Interests: Tying Hands versus Sinking Costs,” *Journal of Conflict Resolution* 41, no. 1 (1997): 68–90.

Though Fearon was not writing about nuclear signaling specifically, both of his findings suggest that U.S. leaders may enhance their credibility by making public nuclear threats rather than by sending nuclear-capable bombers to convey the same message to an adversary. Kenneth Schultz argues that having a domestic opposition party support the leader's threat also increases the credibility of the threat.¹⁴ Finally, Shuhei Kurizaki finds that, in certain circumstances, leaders will benefit from making private threats to an adversary during a crisis.¹⁵ In many cases during the Cold War, American leaders did convey discreet, or even secret, threats to adversaries. Perhaps these threats are more credible than public threats?

Scholars employing statistical models have also sought to understand the relationship between nuclear weapons and successful coercion. Kyle Beardsley and Victor Asal find that nuclear states have an increased probability of prevailing against nonnuclear states, but because they are using statistical models they do not examine how nuclear weapons are used for coercive purposes.¹⁶ Their cases include all conflict dyads involving a nuclear weapon state and therefore include cases in which nuclear weapons are not explicitly threatened to bring about a specific outcome.

Anne Sartori's book-length examination of "deterrence by diplomacy" uses game theory and statistical models to illustrate that signaling through diplomacy works when countries have a reputation for honesty. Contrary to much of the signaling literature, she argues that signals must not always be costly to be effective.¹⁷ Using dyads of conflict from the Correlates of War (COW) and the Militarized Interstate Dispute (MID) data sets, she finds that a country defending an attack from a challenger is more likely to successfully defend the attack if it has a reputation for honesty.¹⁸ One problem with her models, however, is that she does not know if each of the dyads in her models fit the type of situation she is testing. Specifically, because the MID data set does not provide information about a state's action before the highest level of hostility is reached, she cannot be certain that the relationship she posits actually exists.¹⁹

In addition to a dearth of qualitative work on signaling in the post-Cold War period, few studies specifically focus on nuclear signaling. One researcher who has explored this issue, Samuel Black, developed a data set of nuclear signaling from 1970 to 2010 among all nuclear powers. Though Black provides some valuable insights about the political use of nuclear weapons, his definition of nuclear threat is broader than the one used in this paper. Many of his examples may be better conceptualized as shows of

14. Kenneth A. Schultz, "Domestic Opposition and Signaling in International Crises," *American Political Science Review* 92, no. 4 (1998): 829–844.

15. Shuhei Kurizaki, "Efficient Secrecy: Public versus Private Threats in Crisis Diplomacy," *American Political Science Review* 101, no. 3 (2007): 543–558.

16. Kyle Beardsley and Victor Asal, "Winning with the Bomb." *Journal of Conflict Resolution* 53, (2009): 278–301.

17. Anne E. Sartori, *Deterrence by Diplomacy* (Princeton, N.J.: Princeton University Press, 2005).

18. *Ibid.*, 95.

19. *Ibid.*, 83.

force—vague threats outside a crisis environment.²⁰ Furthermore, he codes movements of aircraft carriers as nuclear threats in the post–Cold War period; this threat is unlikely to be viewed as nuclear following President Bush’s 1991 Presidential Nuclear Initiatives, which removed nuclear-capable forces from surface ships.

Why Nuclear Signaling?

Nuclear signaling is an important area of inquiry. The *2010 Nuclear Posture Review* is explicit in its assumption about the value of nuclear signaling in its discussion of the bomber force: “Unlike ICBMs [intercontinental ballistic missiles] and SLBMs [submarine-launched ballistic missiles], bombers can be visibly deployed forward, as a signal in crisis to strengthen deterrence of potential adversaries and assurance of allies and partners.”²¹ Scholars and military thinkers often cite the ability to support the deterrence mission by demonstrating resolve as the primary value of this leg of the nuclear triad. The president can illustrate his resolve by ordering the movement of a contingent of bombers abroad, whereas ICBMs in silos and SLBMs in submarines are largely hidden from view.²² As former secretary of state Henry Kissinger stated, “What threats . . . can one make with solid fuel missiles? If weapons are in an extreme state of natural readiness, how can one demonstrate the increasing preparedness that historically served as a warning?”²³ Today bombers are considered the currency of nuclear signaling, but this assumption, as discussed below, is problematic.

Fundamentally, signaling is the study of coercion for the purposes of war prevention or conflict deescalation by illustrating resolve to adversaries. Understanding the efficacy of different types of signals may help explain previous conflicts and potentially prevent future escalations. During the Cold War, signaling between the United States and the Soviet Union represented the highest stakes in war prevention. In a more multipolar world, with a rising China and the potential for additional nuclear weapon states, understanding nuclear signaling will be just as important, but also more complicated. Understanding the historical record of signaling in the nuclear age is a starting point for understanding the future of one type of conflict prevention.

Methodology

This study examines the set of cases since 1945 in which the United States has used nuclear threats to signal resolve to an adversary in order to bring about some desired outcome during a period of crisis. In each case, the type of nuclear signal issued—

20. Samuel Black, “The Changing Political Utility of Nuclear Weapons: Nuclear Threats from 1970 to 2010,” Stimson Center, August 2010, http://www.stimson.org/images/uploads/research-pdfs/Nuclear_Final.pdf.

21. U.S. Department of Defense, *2010 Nuclear Posture Review*, 22.

22. See, e.g., Adam B. Lowther, “Should the United States Maintain the Nuclear Triad?” *Air & Space Power Journal*, Summer 2010, <http://www.airpower.maxwell.af.mil/airchronicles/apj/apj10/sum10/04lowther.html>.

23. Quoted by Jervis, *Logic of International Relations*, 228.

movement of weapons (including movement, alerting, or publicized testing), rhetorical threats, or both are examined—and whether the signal led to a favorable outcome for the United States. For each of the 15 cases examined, the study relies on a number of secondary historical sources. Some cases, like those occurring during the Eisenhower administration, are the subject of hundreds of articles and books, while others have relatively few sources. These sources are used to trace the signal from the U.S. administration to its interpretation by the adversary and its effect on adversary policy decisions. In some cases, the success of the signal is underdetermined by the extant historical record or a subject of controversy among historians. There is rarely “smoking gun” evidence to determine whether it was the nuclear signal that led to the crisis outcome.

The cases are coded trichotomously based on whether the evidence suggests that the nuclear signal was *influential* in bringing about a successful crisis outcome; had *little impact* on the outcome, regardless of whether the outcome was considered successful by the United States; or was *superfluous* to the crisis outcome. Cases coded as superfluous include signals issued after key decisions or events had already occurred that brought about the end of the crisis.

The Universe of Cases

This study attempts to examine all cases of United States–issued nuclear threats during periods of crisis since the advent of nuclear weapons. The unit of analysis in this study is a specific instance of nuclear threat by the United States against a target state or states, in order to achieve a particular outcome during a crisis. More than one threat may be issued in the course of a single period of heightened tension. Instances when nuclear threats are examined are limited to the relatively short periods of crisis or high tension in which the United States has issued threats about the specific ongoing or impending crisis to bring about a specific outcome. For example, the Bush and Obama administrations stating that “all options are on the table” vis-à-vis the Iranian nuclear program would not fit into this universe of cases. Though these statements represent a threat, they were not conveyed during a specific crisis. Furthermore, this study is limited to cases in which the United States is *seeking a specific outcome from a target country*. This is an important distinction, because the universe of cases does not include shows of force meant to assure allies—also an important use of signaling. Instead, this study is primarily aimed at learning about how nuclear signaling may serve to bring about outcomes sought by the United States in the midst of a crisis.

Project Limitations

The primary limitation on this project is the challenge of finding data sufficient to determine whether a U.S. threat was influential or not. The strength of the findings hinges on whether it can be determined how a target leader interpreted a signal. Short of this information or the resources to acquire it, the coding of cases is based upon evidence of the target state’s subsequent behavior after the threat was issued. For this information, secondary historical sources are used, as well as primary sources when available.

A second major limitation of this project relates to selection effects. It may be the case that nuclear signals are only issued in challenging cases when they are unlikely to succeed. Indeed, in many cases nuclear signals are issued because conventional deterrence has failed. Fearon criticizes a number of Cold War studies on deterrence for focusing only on immediate deterrence, cases in which the odds of success of any policy are likely to be low because the nations are already in crisis and therefore deterrence has already failed.²⁴ Nonetheless, this paper is primarily aimed at examining two assumptions in strategic literature, that nuclear threats can signal resolve and that bombers are the best means for issuing this threat. Despite the selection concerns, this paper can still make a meaningful contribution toward assessing these assumptions. A more comprehensive study would examine all types of military signaling to include conventional and nuclear threats, as well as cases in which signaling could have occurred but did not (the negative cases), in order to avoid selection effects. With limited space, this study only tackles known cases of U.S. nuclear crisis signaling, as shown in table 1.

Table 1. Findings for Known Cases of U.S. Nuclear Crisis Signaling

Case	Threat	Did Signal Involve Movement or Alerting of Nuclear Weapons?	Did Signal Include Rhetorical Threat to Adversary?	Effect of Nuclear Signaling on Bringing About Desired Outcome
1948: USSR—Berlin Crisis	President Truman sends 60 B-29s to England in June 1948 over Soviet-instituted blockade. Leaks indicated bombers were nuclear-capable.	Yes	No	Little impact. Successful crisis outcome in 1949 long after signal.
1950: China—Korean War	“In a modification of the Berlin 1948 feint,” Truman sends bombers to Britain in July. ¹ In August, <i>New York Times</i> reports that B-29s will be moved to Guam. ²	Yes	No	Little impact. Facing pressure, Truman quickly recants his threat. Bomber movement called a “normal rotation.”
1950: China—Korean War	In response to surprise intervention of Chinese troops in November, Strategic Air Command (SAC) goes on full alert, and in a press conference, Truman threatens “every weapon that we have” may be used. ³	Yes	Yes	Little impact. Again, Truman backed off his threat after a firestorm of criticism.

24. James D. Fearon, “Selection Effects and Deterrence,” *International Interactions* 28 (2002): 5–29.

Table 1 (continued)

<p>1953: China— Korean War</p>	<p>Eisenhower administration indirectly transmits three veiled nuclear threats to Communists in the spring, threatening escalation if armistice is not achieved quickly. Nuclear capable missiles are sent to Okinawa.⁴</p>	<p>Yes</p>	<p>Yes</p>	<p>Scholarship mixed. Kissinger and Eisenhower claim signals ended the war, but scholars are mixed on this claim.</p>
<p>1955: China— Taiwan Strait Crisis</p>	<p>In March, Secretary of State Dulles and President Eisenhower allude to nuclear use to defend Taiwan in a number of settings. Officials publicly announce a series of tactical nuclear tests.</p>	<p>Yes</p>	<p>Yes</p>	<p>Influential. Signals appear to have influenced the Chinese decision to back down.</p>
<p>1956: Soviet Union—Suez Crisis</p>	<p>After the Soviets suggest a joint U.S.-USSR intervention in Egypt against Britain, France, and Israel, and threaten the Britain and France with nuclear retaliation, Eisenhower responds in a letter threatening USSR with nuclear retaliation in event of an attack on London or Paris. SAC is put on modified alert.</p>	<p>Yes</p>	<p>Yes</p>	<p>Superfluous. Conflict resolved independent of threat.⁵</p>
<p>1958: Middle East Crisis</p>	<p>Eisenhower orders SAC on alert during its intervention in Lebanon to induce Soviet caution.</p>	<p>Yes</p>	<p>No</p>	<p>Influential. Record indicates that Khrushchev did not offer aid to Egyptians as a result of alert.</p>
<p>1958: China— Quemoy and Matsu Crisis</p>	<p>Members of Eisenhower administration threaten nuclear use to protect Quemoy and Matsu islands. In August and September, SAC increases strength of alerted forces on Guam.</p>	<p>Yes</p>	<p>Yes</p>	<p>Influential. Signals appear to have led Chinese to settle dispute peacefully.</p>
<p>1962: Soviet Union—Cuban Missile Crisis</p>	<p>Kennedy orders increased alert for conventional and nuclear weapons and orders naval blockade around Cuba. SAC raised to DEFCON 2. In a speech, Kennedy threatens full retaliatory response if United States is attacked.</p>	<p>Yes</p>	<p>Yes</p>	<p>Influential. Most historians conclude that this threat was influential.</p>

Table 1 (continued)

1969: Soviet Union—Vietnam War	Nixon launches nuclear alert and a show of force in October to threaten Soviets to pressure North Vietnamese to end war. Issues veiled threats in meetings with Dobrynin.	Yes	Yes	Little impact. Little evidence that Soviets responded to this signal.
1971: India—India-Pakistan War	Nixon threatens India by sending nuclear-armed Seventh Fleet to Bay of Bengal to promote restraint in war with Pakistan.	Yes	No	Superfluous. Gandhi had previously decided to end conflict so signal had little impact on intended outcome.
1973: Soviet Union—Egypt-Israeli War	In October, Kissinger raises the alert level to DEFCON 3 to threaten USSR against intervention in Egypt-Israeli War.	Yes	No	Superfluous. Conflict resolved independent of threat.
1991: Iraq—Gulf War I	Bush threatens Iraq with nuclear use over potential chemical weapons / biological weapons (CWs/ BWs) use.	No	Yes	Scholarship mixed. Disagreement over the credibility of evidence suggesting Saddam was deterred.
1998: Iraq—lack of cooperation with IAEA	A Pentagon spokesman says the United States has not ruled in or out a U.S. nuclear strike on Iraqi facilities if Iraqi government deploys CWs or BWs. ⁶ Britain and United States undertake conventional bombing campaign against Iraq, but Iraq fails to readmit inspectors.	No	Yes	Unknown. Undetermined whether Iraq had BWs or CWs at this point, so whether the threat mattered is unknown.
2003: Iraq War	Number of Bush administration officials state that nuclear weapons are not off the table in response to potential WMD use by Iraq. ⁷	No	Yes	Superfluous. Iraq no longer had BWs and CWs.

1. Nina Tannenwald, *The Nuclear Taboo: The United States and the Non-Use of Nuclear Weapons since 1945* (Cambridge: Cambridge University Press, 2007), 117.

2. The bombers in this case were unarmed, but this was a guarded secret. Leaks suggested the bomber were armed.

3. Quoted by Richard Betts, *Nuclear Blackmail and Nuclear Coercion* (Washington, D.C.: Brookings Institution Press, 1987), 33.

4. *Ibid.*, 43.

5. As Betts writes, "There are no persuasive grounds for assuming that the ambiguous nuclear elements in either superpower's signals had a meaningful impact on the outcome, because the military results on the ground...was acceptable to both Moscow and Washington" *Ibid.*, 64.

6. Ian Bruce, "Iraq Faces U.S. Nuclear Threat as Tension Rises," *The Herald* (Glasgow), January 20, 1998, <http://www.heraldsotland.com/sport/spl/aberdeen/iraq-faces-us-nuclear-threat-as-tension-rises-1.357251>; cited by Samuel Black, "The Changing Political Utility of Nuclear Weapons: Nuclear Threats from 1970 to 2010," Stimson Center, August 2010.

7. See, e.g., "Bush Adviser: Nuclear Weapons an Option in Possible War," CNN, January 26, 2003, http://articles.cnn.com/2003-01-26/us/sprj.irq.nuclear_1_nuclear-weapons-nuclear-threshold-mass-destruction?_s=PM:US.

This study asks two questions: Does nuclear signaling work in a crisis? And is the movement of weapons, especially nuclear bombers, an effective signal? The short answer to the first question is no. In the majority of cases, nuclear signaling does not appear to have influenced the outcome of the crisis—signaling failed to bring about the intended outcome or was irrelevant to the outcome. For the second question, there were only four cases in which the movement of weapons was not accompanied by a matching rhetorical threat; three had little effect on the outcome, and one was influential. In the two cases in which the deployment of bombers was the only signal, in 1948 and 1950, the signals failed to bring about the desired outcome. These two signals were both ambiguous with the bomber movement lacking matching consistent rhetoric. In 1971, when Nixon sent a nuclear-armed fleet to India, this signal was superfluous to the outcome—Indira Gandhi had already made the decision to end the war with Pakistan when Nixon attempted to coerce her to limit it.²⁵ The Strategic Air Command (SAC) alert during the 1958 Middle East Crisis, in contrast, does appear to have influenced Soviet behavior without a rhetorical threat. In sum, nuclear signaling has rarely brought about the outcome the administration was seeking during a crisis. For such a risky maneuver—see Scott Sagan’s work for the many close calls that occurred during periods of nuclear alert—this fact alone should induce caution about this policy option.

In only 4 of the 15 cases does the historical record indicate that the nuclear signal was important to bringing about the desired outcome. These cases include the Taiwan Strait crises in 1955 and 1958, the Middle East Crisis in 1958, and the Cuban Missile Crisis in 1962. In three of these cases, a specific rhetorical threat was matched by nuclear weapons movement, nuclear alerting, or the testing of nuclear weapons. In the 1958 Lebanon case, a nuclear alert without an accompanying rhetorical threat brought about caution in the Soviet Union.

Why were these cases successful instances of nuclear signaling? During the Cuban Missile Crisis, the United States issued a strong nuclear threat and alerted its nuclear forces, but it also matched these threats with a strong conventional response, including the blockade of Cuba. Perhaps in combination, these threats were more credible to the Soviets. By creating a blockade, President Kennedy created a visual redline, the crossing of which was too dangerous to consider. During the Taiwan Strait Crisis, strong rhetorical and nuclear signaling by the United States, along with a lack of confidence in Soviet nuclear assurances, appears to have led the Chinese to seek negotiations and avoid escalation.

Finally, the U.S. alert of SAC during the 1958 Middle East Crisis is known to have caused the Soviet leadership to behave cautiously in the Middle East. When the Egyptians sought support from the Soviets, Khrushchev reportedly thought that “the Americans had gone off their heads” and stated that “we are not ready for confrontation. We are not ready for World War III.”²⁶ Perhaps this unexpected nuclear alert in an area of important American interests left the Soviets with a clear message of resolve. Most of

25. T. V. Paul, *The Tradition of Non-Use of Nuclear Weapons* (Stanford, Calif.: Stanford University Press, 2009), 77.

26. Quoted by Betts, *Nuclear Blackmail*, 67.

these successful cases are examples of deterrent threats, which is consistent with the extant literature finding that deterrence is more successful than compelling the other party.²⁷ Deterrent threats allow the adversary to save face because they involve maintaining the status quo and not changing behavior as a result of a threat. Moreover, compelling threats often occur after deterrent threats have already failed.

Nuclear signaling appears to have not influenced outcomes for many reasons. In a number of cases, the signal was superfluous to the outcome. For example, the nuclear threat may have been issued too late to make an impact on an already-determined outcome (as it appears to have been when Nixon threatened India in 1971). In the Suez Crisis in 1956 and the Arab-Israeli War in 1973, the acceptable resolution of events on the ground also made the nuclear threats (from both the United States and the Soviets) superfluous to the outcome. The threat against Saddam Hussein in 2003 appears to have been irrelevant to the outcome sought—the nonuse of chemical weapons (CWs) and biological weapons (BW) against coalition soldiers—once the United States was unable to find the stockpiles of CWs and BWs after the war. Or in other cases when the threats had little influence, it may be because they were too ambiguous or uncertain, as in the case of Truman’s nuclear threats in 1948 and 1950.

Finally, it may be that these types of threats fail to have influence because they are not credible. After all, states that are willing to follow through on their nuclear threats are willing to make these threats, but so too are states that are bluffing. Because both credible signalers and bluffers are willing to send the same signal, the adversary learns little about which type of threat it is facing. Therefore, the target of the signal is able to draw few if any conclusions, and the signal has little effect on its perceptions. Thus, these results seem to suggest that nuclear signaling is essentially a form of cheap talk in many of these cases.

Though a number of cases were coded as having little impact or being superfluous in bringing about the intended outcome during a crisis, it is important to consider that signals may have had some positive consequences for the United States. This study, as a first cut in examining nuclear signaling, codes outcomes trichotomously, but of course signaling is more nuanced and may have less visible effects on crisis outcomes. Betts makes this point when criticizing those who suggest that Truman’s 1948 signal of sending B-29 bombers across the Atlantic was a failure, suggesting that it was a means of deterrence that likely induced caution.²⁸ A stronger signal might have led to war, which was not in the interest of either the United States or the Soviets. Though Truman’s signal did not lead to the end of the blockade and thus is not considered successful in this study, it may have helped to create an environment in which the Soviets proceeded more cautiously.

A few of the above-noted cases are coded as *scholarship mixed* because historians and political scientists remain divided on the particular nuclear signal’s efficacy. For

27. Robert J. Art, “Coercive Diplomacy: What Do We Know?” in *The United States and Coercive Diplomacy*, edited by Robert J. Art and Patrick M. Cronin (Washington, D.C.: U.S. Institute of Peace Press, 2003).

28. Betts, *Nuclear Blackmail*, 30.

instance, President Eisenhower's nuclear threats during the Korean War have been subject to a great deal of examination. Years after the conflicts, Eisenhower claimed that his administration issued three secret messages to the Chinese in the spring of 1953 (one via the Indian prime minister) that a failure to reach armistice quickly would lead the United States to no longer place limits on its weapons used and that this is the reason the war ended.²⁹ According to the historian James Matray in his review article on Korean War scholarship, scholars are mixed on whether the nuclear threats brought about the desired outcome of ending the conflict. Some historians—including Stephen E. Ambrose, Robert A. Divine, and Daniel Calingaert—argue that nuclear coercion played a role in ending the conflict.³⁰ Most historians, however, argue that the nuclear threats were not the cause of the war's termination for a variety of reasons, including that the threats came two months after the Soviet decision to end the conflict.³¹ Data from the Chinese government are necessary to make a sound conclusion about the impact of the signal.

The 1991 Gulf War threat issued by President George H. W. Bush is also a subject of debate among scholars. After the war, some scholars argued that Saddam was effectively deterred from using CWs or BWs.³² David Palkki, who has examined troves of Iraqi government documents recovered during the war, argues that these documents indicate that the Iraqi regime was deterred by Bush's threat. Others, including Scott Sagan and Michael S. Gerson, doubt that the nuclear threat was the reason for restraint. Reasons for their skepticism include the fact that Saddam was also threatened with regime change if CWs or BWs were deployed—a more credible and dangerous threat for the leader—and that the nuclear threat provided a convenient face-saving excuse for not deploying these weapons during the conflict.³³

Finally, the 1998 Iraq threat is coded as unknown because there is little evidence of the threat's impact on the Iraqi leadership. It is unclear whether Iraq had CWs or BWs in 1998, so whether Saddam Hussein was deterred against using these weapons is unknown.

Lessons

In addition to the findings above, a brief examination of these cases yields at least three lessons about nuclear signaling. This section briefly discusses each one.

29. Michael Gordon Jackson, "Beyond Brinkmanship: Eisenhower, Nuclear War Fighting, and Korea, 1953–1968," *Presidential Studies Quarterly* 35, no. 1 (March 2005): 67.

30. James I. Matray, "Korea's War at 60: A Survey of the Literature," *Cold War History* 11, no. 1, (February 2011): 117.

31. Nina Tannenwald, *The Nuclear Taboo: The United States and the Non-Use of Nuclear Weapons since 1945* (Cambridge: Cambridge University Press, 2007), 150n136.

32. See, e.g., Robert J. Art, *A Grand Strategy for America* (Ithaca, N.Y.: Cornell University Press, 2003), 49.

33. Michael S. Gerson, "No First Use: The Next Step for U.S. Nuclear Policy," *International Security* 35, no. 2 (Fall 2010): 7–47. Also see Scott D. Sagan, "The Commitment Trap: Why the United States Should Not Use Nuclear Threats to Deter Biological and Chemical Weapons Attacks," *International Security* 24, no 4 (Spring 2000): 85–115.

Lesson 1: Crisis signaling is more successful when rhetoric and hardware are used in conjunction. The results discussed above indicate that crisis signaling has historically had a low success rate, but the more successful cases do suggest that signaling is more effective when the movement or alerting of weapons is combined with rhetorical threats. This combination of threats is not sufficient for success (three similarly coded cases failed to achieve the desired outcome), but it does appear that the combination of rhetorical threats and weapons movement is more likely to be successful than either alone. This finding can probably be explained quite simply—the more signals that are issued at a specific time, the more credible they become. The message is less likely to be lost among the noise. In the case of U.S. signals, the combination of moving hardware and using public rhetorical threats means engaging in both the costs of changing weapons configurations and the audience costs of making public threats.

What does this mean for nuclear signaling today? During the Cold War, nuclear alerts were likely to be picked up by the Soviet Union; today, it is less clear that all types of potential adversaries would pick up changed alert postures. Instead signaling is more likely to be accomplished by the movement of bombers. However, bombers also have conventional missions (as do dual-capable aircraft), so picking up a nuclear threat from the movement of weapons is likely to be more difficult in the present era. This factor speaks to the importance of matching the movement of weapons with a rhetorical threat, whether issued publicly or in a secret message sent to adversary leadership. If presidents continue to pursue the goal of reducing the salience and relevance of nuclear weapons, it seems less likely that presidents will issue public nuclear threats in all but the direst circumstances. This may have the effect of making the rare instances of nuclear threat more credible, especially if weapons movement is matched by a specific rhetoric threat.

Lesson 2: It is difficult to determine whether nuclear signals (of any type) are successful, especially when the signals were recently issued. It is difficult in general to make definitive conclusions about the success of particular cases of signaling, but it is especially challenging the immediate aftermath of a crisis. With the passage of time, it becomes less difficult, as conflicts end, leaders change, and documents become declassified. Despite the difficulty of determining signaling's success, some U.S. leaders have drawn false connections between previous “successful” cases of signaling and their contemporary policy challenges.

Often, it is feasible that factors other than the signal may have led to the positive outcome, but leaders—including Truman, Eisenhower and Nixon—assumed that it was their nuclear resolve that led to positive outcomes when the evidence was fuzzy or even contradictory. Scott Sagan's 1985 description and assessment of nuclear signaling during the October 1973 war illustrates this challenge. After the Soviets suggested that if the United States were unwilling to jointly implement the cease-fire between Egypt and Israel, they would be prepared to act unilaterally, President Nixon was alarmed. He did not want Soviet troops on Egyptian soil. The administration made the decision to raise the alert posture to defense readiness condition (DEFCON) 3, which included steps to increase the readiness of nuclear-armed submarines and bombers. Soon after, the Soviet planes transporting Soviet troops returned back to the Soviet Union. At first glance, this

appears to be a clear-cut case in which global nuclear alert signaled U.S. resolve and thus led the Soviet Union to back down.

Sagan, however, provides additional possible reasons behind the Soviet change. First, it may have been that the Soviets were only seeking that the United States restrain the Israelis—which Kissinger attempted to do—and never intended to intervene in Egypt. In this case, the signal did not prevent Soviet intervention in the conflict because they were not intending to become involved. Second, after receiving a letter from Kissinger, Anwar Sadat changed his request from seeking a U.S.-Soviet peacekeeping intervention to requesting UN peacekeepers. This new request did not provide the Soviets with an excuse for intervention.³⁴ This appears to be a case in which changes on the ground led to a resolution independent of the nuclear threat issued. With new evidence and the passage of time, scholars are usually better able to assess the nuclear signal's effect or lack of effect.

Lesson 3: Many U.S. leaders have drawn incorrect historical analogies or lessons from previous cases of signaling, especially cases of perceived success. When U.S. leaders assume that nuclear signals worked on previous occasions without knowing for certain how the desired outcome came about, they potentially set dangerous precedents for future leaders. In the 1950s, the Eisenhower administration looked to Truman's dispatch of B-29 bombers to Great Britain during the 1948–1949 Berlin Crisis as a model for bringing the Korean War to an end, even though in the summer of 1948, members of the Truman administration did not think this show of resolve “directly contributed” to the resolution.³⁵ Based on Truman's model, Eisenhower administered a number of nuclear threats during its tenure, with mixed success.

Eisenhower also passed on advice to future administrations based on his assumed success in ending the Korean War via nuclear threats. To this day, scholars still cannot agree if Eisenhower's signals were determinative or not. During the Johnson administration, Eisenhower was consulted on Vietnam War policy options. At a meeting on February 17, 1965, Eisenhower provided members of the Johnson administration with his opinion on how to end the Vietnam War. In arguing how to avoid Soviet intervention in Vietnam, he relayed that “shortly after he came to office, he had three messages passed to the Koreans and Chinese. . . . The gist of the messages was that if a satisfactory armistice were not signed promptly, we would remove the limits we were observing as to the area of combat and the weapons employed.”³⁶ Eisenhower assumed that his nuclear threats were the reason behind the successful armistice, but many historians now disagree with that assessment.³⁷

34. Scott Sagan, “Nuclear Alerts and Crisis Management,” *International Security* 9, no. 4 (Spring 1985): 99–139.

35. Roger Dingman, “Atomic Diplomacy during the Korean War,” *International Security* 13, no. 3 (Winter 1988–89): 52.

36. Quoted by Michael Gordan Jackson, “Beyond Brinkmanship: Eisenhower, Nuclear War Fighting, and Korea, 1953–1968,” *Presidential Studies Quarterly* 35, issue 1 (March 2005): 52–75.

37. Matray, “Korea's War,” 117.

President Nixon then subsequently looked to the Eisenhower administration as a model for his “madman theory” of using nuclear threats to achieve policy outcomes throughout his administration. Nixon’s chief of staff, H. R. Haldeman, quoted the president in 1968:

I call it the Madman Theory, Bob. I want the North Vietnamese to believe that I’ve reached the point that I might do anything to stop the war. We’ll just slip the word to them that ‘for God’s sake, you know Nixon is obsessed about Communism. We can’t restrain him when he is angry—and he has his hand on the nuclear button—and Ho Chi Minh himself will be in Paris in two days begging for peace.’³⁸

Nixon’s use of nuclear signaling targeted at the Vietnamese, the Soviets and the Indians was largely ineffectual, however.

Conclusion

This project has sought to offer a preliminary examination of the efficacy of nuclear signaling in a crisis. In most historical cases, it appears that nuclear signals rarely work as intended. The conclusion drawn by George and Smoke in 1974 remains relevant today: Nuclear signals have often been “irrelevant or dysfunctional.” Similarly, Betts wrote in 1987 that American nuclear threats “were usually hesitant and elliptical.”³⁹ This basic finding suggests that policymakers who may consider issuing nuclear threats in the future must think twice about this policy option, being very careful to make the threat as clear and credible as possible. Threats appear to be more successful when issued along multiple channels. This research also indicates that using past cases of nuclear signaling as historical analogies to aid current policymaking may be problematic. Finally, it serves to remind policymakers that the nuclear bombers or dual-capable aircraft are not the only means to signal resolve using nuclear weapons, and in fact, this method of signaling may be insufficient if not accompanied by a clear rhetorical threat.

Future research on this topic may explore the type of threats in terms of their specific goals. Other variables that could be examined include whether the rhetorical threat was issued in public or in private. President H. W. Bush and President Dwight Eisenhower chose to make some threats in private to their counterparts, while other threats were issued at press conferences. The audience costs literature suggests the public threat would be more effective, but the data do not necessarily support this conclusion. Related to this variable is the question of whether the threat is issued directly or through an intermediary. President Eisenhower issued one of his threats through the Indian prime minister during the Korean War. It would appear that this might weaken the signal as it is transmitted through multiple parties, but if the intermediary is convinced of the credibility of the threat, then it may be more credible than a threat issued directly. Another variable of interest in determining the effectiveness of signals is whether the threat is aimed at deterring or compelling the adversary’s behavior. Complying with a deterrent threat is

38. Quoted by Sagan and Suri, “Madman Nuclear Alert,” 156.

39. Betts, *Nuclear Blackmail*, 8.

hypothesized to be easier because it allows the target leader to save face by continuing its current course of action. Complying with a compelling threat may make the target leader appear weak.

Extending Deterrence to the Gulf

Matthew Hallex

Iran's nuclear ambitions pose a threat not only to the interests of the United States but also to its allies in the region. A nuclear Iran could not only undermine the security of U.S. partners but also set the stage for further nuclear proliferation in the Middle East. America's extended deterrent guarantees will be an important tool in ensuring regional stability and security and in preventing a cascade of proliferation. During the Cold War, forward-deployed tactical nuclear weapons played an important role in ensuring that such guarantees were credible to enemies and assuring to allies, but shifting norms on the use of nuclear weapons have eroded their value in this role. This paper evaluates the potential role of tactical nuclear weapons in deterring a nuclear Iran and proposes a framework for creating an extended deterrent regime to meet this challenge.

Introduction

On a visit to Southeast Asia in July 2009, U.S. secretary of state Hillary Clinton said on Thai television that if Iran were to develop nuclear weapons, the United States would respond by extending a "defense umbrella over the region" that would make it "unlikely that Iran will be any stronger or safer."¹ If sanctions fail to prevent Iran from becoming a nuclear power, the United States' extended deterrence will be an important factor in guaranteeing the stability of the Middle East. During the Cold War, America's extended deterrent guarantees had a significant nuclear component. Although U.S. strategic nuclear weapons will continue to serve as the foundation of U.S. national security policy, the potential role of tactical nuclear weapons is less clear.

This paper explores the dimensions of an American extended deterrence regime in response to an Iranian decision to go nuclear. Particular emphasis is placed upon evaluating the potential role for American tactical nuclear weapons in providing an extended deterrent guarantee to U.S. allies and partners in the region. The paper explores the prospect of a nuclear Iran and the threat that this would pose to the United States and its allies. The role of nuclear weapons in U.S. extended deterrence in the Cold War and post-Cold War periods is examined, followed by an evaluation of the value of tactical

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1. Jay Solomon and Hames Hookway, "Clinton's 'Defense Umbrella' Stirs Tensions," *Wall Street Journal*, July 23, 2009, <http://online.wsj.com/article/SB124826266087471853.html>.

nuclear weapons in deterring Iran. The paper further proposes a framework for an extended deterrent regime appropriate for the contemporary regional security environment.

A nuclear Iran is not an inevitable outcome. Sanctions may prove successful, or Iranian internal politics may lead Iran to choose to eschew nuclear weapons. This paper addresses the prospect of a nuclear Iran as a potential policy challenge and also as a useful thought experiment regarding some of the issues arising from the use of nuclear weapons in America's extended deterrent strategies. Although planning for the potential threat posed by a nuclear Iran is an important task, many of the concepts discussed here are equally applicable to decisions about the value of the American nuclear weapons deployed on the soil of NATO allies or in response to potential demands from South Korea to deploy nuclear weapons on the peninsula.

The Prospect of a Nuclear Iran

Iran's commitment to becoming a nuclear state is still unclear. It has developed significant nuclear capabilities that it claims are intended for civilian purposes but that could have military applications. The country is attempting to establish an independent fuel cycle through the development of uranium mining, processing, and enrichment technologies and facilities.² Although many of these facilities have been declared by Iran to the International Atomic Energy Agency (IAEA), a number have been concealed or constructed underground. The development of fuel cycle capabilities does not necessarily suggest the development of nuclear weapons and is arguably allowable under the terms of the Nuclear Non-Proliferation Treaty (NPT), but Iran has not been in compliance with its IAEA obligations and is subject to multilateral sanctions banning such activities.³ The 2007 U.S. National Intelligence Estimate changed the previous official interpretation of Iranian activities and reported that Iran had ended its nuclear weapons program in 2003.⁴ Although Iran may not currently be conducting a nuclear weapons program, it is developing many capabilities that would enhance its ability to do so.

In addition to developing significant and worrying nuclear capabilities, Iran is also developing a large arsenal of missile systems, which include a number of short- and intermediate-range ballistic missiles that would allow it to target U.S. bases or allies in the Middle East. Furthermore, along with its own independent research and development programs, Iran is engaging in technical cooperation with other states. It has purchased BM-25 missile systems from North Korea, and recent military parades in Pyongyang

2. Mohammad Saeidi, "Nuclear Fuel Cycle Activities in Iran," paper presented at World Nuclear Association Annual Symposium, 2005, <http://www.world-nuclear.org/sym/2005/pdf/Saeidi.pdf>.

3. International Atomic Energy Agency, "Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran," September 2, 2005, <http://www.iaea.org/Publications/Documents/Board/2005/gov2005-67.pdf>.

4. Office of the Director of National Intelligence, "Iran: Nuclear Intentions and Capabilities," November, 2007, http://www.dni.gov/press_releases/20071203_release.pdf.

have displayed missiles with triconic nosecones similar to those of the Iranian missile system.⁵ Although Iran currently only possesses short- and intermediate-range missile systems, it is attempting to develop longer-range capabilities. According to U.S. Defense Department officials, Iran could deploy intercontinental ballistic missiles (ICBMs) by 2015.⁶

These developments, however, do not indicate that Iran is committed to becoming a nuclear power. A number of states that were also technically capable of becoming nuclear states have ultimately chosen not to do so. Iranian efforts are also being frustrated by sanctions imposed by the United States, the United Nations, and other states around the world. Although Iranian nuclear decisionmaking remains opaque, these capabilities and research efforts merit a consideration of possible responses to this potentially serious threat.

The Threat Posed by a Nuclear Iran

Iran has posed a persistent but manageable security challenge to the United States for decades. The United States has enjoyed significant conventional superiority in the Middle East, where it has a substantial network of allies and military bases. In response, Iran has developed asymmetric capabilities, including ballistic missiles, and has cultivated ties with nonstate actors as a means of power projection. The events of recent years have demonstrated that the possession of nuclear weapons provides a great deal of security to states that oppose U.S. policy. Although a conventional Iran has been a persistent irritant, a nuclear Iran poses new challenges to the United States.

A nuclear Iran could pose a direct threat to U.S. forces and bases in the Middle East. If Iran were to develop ICBMs, it could also pose a direct threat to the U.S. homeland. Although Iran is unlikely to develop a substantial number of missiles with the necessary range to threaten the U.S. homeland, it is likely that Iran would calculate, much like China has, that a relatively small number of weapons would be sufficient to deter the United States.⁷ And though the threat of a nuclear attack on the U.S. homeland would be immensely troubling to U.S. policymakers and the public, it would likely require little in the way of new capabilities or policies. Current U.S. strategic nuclear forces have served to credibly deter the nuclear arsenals of other great powers and would likely continue to do so in the case of Iran. Iranian possession of ICBMs would have a marginal impact on U.S. decisions about nuclear force structure, particularly if the United States decided to reduce the size of its nuclear arsenal, but would be unlikely to pose a significant challenge.

5. David A. Fulghum and Robert Wall, "Iranian Missile Tech Appears in North Korea," *Aviation Week*, October 14, 2010, http://www.aviationweek.com/aw/generic/story_channel.jsp?channel=space&id=news/awx/2010/10/14/awx_10_14_2010_p0-262107.xml.

6. "Iran Could Develop Missile Capable of US Strike by 2015," *The Telegraph* (London), April 21, 2010, <http://www.telegraph.co.uk/news/worldnews/northamerica/usa/7613261/Iran-could-develop-missile-capable-of-US-strike-by-2015.html>.

7. Ibid.

If Iran were to possess nuclear weapons, it would also likely contribute to Iran becoming a more assertive regional power. While the balance of conventional forces in the region currently makes it difficult for Iran to overtly threaten its neighbors, nuclear weapons could change this equation. In the absence of U.S. guarantees, Iran could attempt to use nuclear weapons to threaten its neighbors and coerce them into shifting their policies in a manner favorable to Iran. Overt threats of the use of nuclear weapons are less likely than Iran exploiting the security provided by possessing nuclear weapons to make greater use of its existing conventional capabilities. With regime survival ensured by nuclear weapons, Iran could prove more willing to use conventional force to resolve a number of its persistent disputes with its neighbors, including unresolved territorial disputes over islands in the Persian Gulf.⁸

Iranian conventional forces could also threaten the sea lines of communication that allow energy to flow from the Middle East to the industrial world. In addition to the threat of the use of force on the part of Iran, nuclear weapons may lead to other forms of adventurism. Many Persian Gulf states have significant populations of Shia Muslims who could turn to Iran for leadership. Iran has threatened to take advantage of the recent unrest in Bahrain to intervene on behalf of the impoverished Shia minority there.⁹ Under the cover of a nuclear capacity, Iran may be more likely to follow through on such threats or otherwise attempt to subvert U.S. allies in the region.

In addition to Iran's potential actions, responses by other states in the Middle East could be deeply unsettling for regional security. Iranian acquisition of nuclear weapons could trigger a proliferation cascade.¹⁰ Other states seeking to secure their own protection could decide to develop nuclear weapons of their own. There are a number of potential proliferants in the region. Saudi officials have recently announced that if Iran became a nuclear armed state, it would also develop nuclear weapons.¹¹ Other states in the region are developing nuclear capabilities that would create a foundation for weapons programs. The United Arab Emirates has attempted to develop a nuclear energy capability, although the terms of its agreement with the United States would preclude the portions of the fuel cycle that would allow for the development of weapons.¹² And Jordan is in the process of concluding a similar agreement with the United States that may not include such restrictions.

8. Lewis Dunn, "Strategic Reassurance If Iran 'Goes Nuclear': A Framework and Some Propositions," *Strategic Insights* 8, issue 5 (December 2009): 53.

9. Dina Al-Shibeeb, "Iran Activists Traveling in Flotilla to Bahrain in Support of 'Oppressed People,'" *AlArabyia News*, May 11, 2011, <http://english.alarabiya.net/articles/2011/05/11/148641.html>.

10. David Brunnstrom, "NATO Warns of Iran Nuclear Domino, Says Back Obama," *Reuters*, January 26, 2009, <http://in.reuters.com/article/2009/01/26/idINIndia-37664720090126?sp=true>.

11. Ray Moseley, "Saudi Prince Warns Iran on Nuclear Weapons," *Al Arabyia News*, June 30, 2011, <http://english.alarabiya.net/articles/2011/06/30/155487.html>.

12. Jonathan Pearl, "Charting a Smarter Course for a U.S.-Jordan Nuclear Deal," *Bulletin of the Atomic Scientists*, October 25, 2010, <http://www.thebulletin.org/web-edition/op-eds/charting-smarter-course-us-jordan-nuclear-deal>.

A more troubling challenge that was not present in the Cold War would be the threat of Iranian transfer of nuclear weapons or material to a nonstate actor. Iran has a long history of using nonstate actors to project power due to its own conventional weaknesses. In recent years, Iran has transferred significant quantities of weapons and material to Hezbollah, including complex missile systems.¹³ Although the use of a nuclear weapon delivered by a missile or other conventional means by Iran would be a simpler task to attribute and to respond to, it would be more difficult to credibly threaten Iran for the use of a nuclear weapon by a nonstate actor such as Hezbollah.

U.S. Extended Deterrence and Its Goals

A nuclear Iran would pose a range of threats to the United States and its interests. Although U.S. strategic weapons have deterred direct threats to the homeland throughout the nuclear age, extended deterrence is a more complex task. Extended deterrence is a process that involves the provision of a military guarantee to a third party. And extended deterrent guarantees suffer from an inherent credibility problem due to the high costs that they impose on the guarantor.¹⁴ Uncertainty about the use of nuclear weapons creates the potential of deterrence failure, along with the problem of assurance—convincing allies that guarantees will be acted upon.

Credible U.S. extended deterrence would serve to help maintain stability in the region following a decision by Iran to become a nuclear state. U.S. guarantees to other states in the region would prevent Iran from using its nuclear weapons to establish itself as a regional hegemon. And likewise these guarantees could help to deter Iran from adventurism that could destabilize states in the region or spark a broader conflict. Maintaining stability in the Persian Gulf and the greater Middle East would ensure energy security for the United States and its allies and prevent a disruption of global oil and natural gas markets, which of course would have significant implications for the American and the world economy.

Credibly assuring U.S. allies would be another important goal of this deterrence strategy. The United States already provides extended deterrent guarantees to a number of states in the region. These guarantees would need to adapt to reflect the new regional nuclear environment, and assuring allies would play two important roles. First, this assurance would help the states in the region to maintain their United States–friendly policies despite the threat posed by Iranian nuclear weapons. And second, a credible extended deterrent would also be an important nonproliferation tool.¹⁵ Allies that have faith in U.S. extended deterrence guarantees are more likely to eschew the development

13. Frank Gardner, “Hezbollah Missile Threat Assessed,” BBC News, August 3, 2006, http://news.bbc.co.uk/2/hi/middle_east/5242566.stm.

14. Scott Sagan and Kenneth Waltz, *The Spread of Nuclear Weapons: A Debate* (New York: W. W. Norton, 1995), 26–27.

15. Clark A. Murdock and Jessica M. Yeats, *Exploring the Nuclear Posture Implications of Extended Deterrence and Assurance* (Washington, D.C.: Center for Strategic and International Studies, 2009), 2.

of independent nuclear capabilities that would allow them to balance a nuclear Iran on their own.

Extended deterrent guarantees would be of particular importance to the United States' Arab allies. Although Israel is an important partner for the United States, it is far more capable than the U.S. Arab allies of independently responding to the threat posed by a nuclear Iran. Israel's current nuclear arsenal would likely prove sufficient to deter an Iranian nuclear strike. These deterrent forces would make a formalized extended deterrence commitment to Israel unnecessary, given that it would not make a significant contribution to Israel's security and would not have an impact on the likelihood of regional nuclear proliferation. Continued cooperation on missile defense systems, however, would be an area of useful engagement with Israel if Iranian capabilities developed further.

Nuclear Weapons and Extended Deterrence in the Cold War

Throughout the Cold War, the United States was in a position of conventional weapons inferiority in Europe and other regions of the world. U.S. nuclear weapons played an important role in compensating for this and in maintaining the balance of power on both the strategic and theater levels. The threat to use nuclear weapons served as the foundation for America's commitments to defend its allies in Western Europe and elsewhere in the world. Nuclear weapons alone, however, were insufficient to provide a credible extended deterrence guarantee. Efforts by the United States to establish a credible extended deterrence regime in NATO and elsewhere were characterized by determining the proper role that nuclear weapons, particularly forward-deployed ones, play in U.S. security guarantees.

Following the Korean War, the Eisenhower administration grappled with the problem of developing capabilities to deter the growing Soviet military threat without imposing too great a cost on the U.S. economy. The "New Look" national security strategy scaled back plans for larger conventional forces in favor of a greater reliance on nuclear weapons as well as of U.S. alliances in key areas of the world. The nuclear component of the strategy relied on the concept of "massive retaliation" articulated by Secretary of State John Foster Dulles. The United States would deploy a "deterrent on a massive retaliatory scale" and respond to Soviet aggression with an attack on the Soviet homeland.¹⁶

Although it addressed the economic restraints on U.S. national security strategy, massive retaliation suffered from a serious credibility problem. This strategy committed the United States to escalate a conflict to a nuclear exchange in response to small-scale Soviet aggression that the United States lacked conventional forces to address. The increasing ability of the Soviet Union to strike the soil of the United States made the threat to begin a general nuclear conflict in response to Soviet conventional aggression ring in-

16. John Lewis Gaddis, *Strategies of Containment* (New York: Oxford University Press, 2005), 144–145.

creasingly hollow.¹⁷ The failure of the United States to adequately respond to lower-level Soviet provocations, such as the crushing of the 1956 revolution in Hungary, underlined the failure of this policy.

The Kennedy administration initially attempted to compensate for the failings of massive retaliation by floating the idea of creating a Multilateral Force (MLF) that would allow NATO allies to jointly control nuclear weapons. The MLF was to consist of multinational-crewed ships armed with ballistic missiles. When disputes about costs, basing, and the ultimate control of launch authority scuttled the MLF, the Kennedy administration and NATO turned to “flexible response,” which involved a more graduated approach to Soviet aggression.¹⁸ The United States and its allies would develop more robust conventional forces that could deter small-scale Soviet aggression, along with a range of tactical nuclear weapons that created a set of rungs on the escalation ladder before launching a broader nuclear exchange.¹⁹ Expanding the number of options available to policymakers made flexible response a far more credible deterrent strategy than massive retaliation. The greater role of tactical nuclear weapons, which were deployed in Western Europe, and some of which were to be delivered by allied military forces in the case of a conflict, also served to assure NATO allies of the value of U.S. extended deterrent commitments.

American extended deterrent commitments during the Cold War were not just limited to U.S. allies in NATO and East Asia. Following the invasion of Afghanistan, the United States established what would be known as the Carter Doctrine, or extending a security guarantee to the Middle East and making it the policy of the United States to prevent the domination of the region by an outside power.²⁰ Nuclear weapons were not explicitly included in the doctrine, and the United States deployed conventional naval forces to the region and established a quick reaction force. Although the doctrine was widely perceived as including a nuclear threat, conventional forces were the chief instruments for establishing it.

Nuclear weapons continued to play an important role in U.S. extended deterrence commitments in Europe during the 1980s, but the improvement in U.S. conventional forces and the development of precision-guided weapons and other technologies reduced their role.²¹ U.S. conventional forces were better placed to carry a greater part of the burden of extended deterrence, and the United States was able to make selective reductions in forward-deployed nuclear forces. Although tactical weapons retained a role, the Intermediate Nuclear Forces Treaty eliminated entire classes of theater nuclear

17. Steven Pifer, Richard C. Bush, Vanda Felbab-Brown, Martin S. Indyk, Michael O’Hanlon, and Kenneth M. Pollack, *U.S. Nuclear and Extended Deterrence: Considerations and Challenges*, Arms Control Series Paper 3 (Washington, D.C.: Brookings Institution, 2010), 4.

18. *Ibid.*, 4–6.

19. *Ibid.*, 5.

20. James A. Russell and James J. Wirtz, “Nuclear Weapons, War with Iraq, and U.S. Security Strategy in the Middle East,” *Strategic Insights* 1, no. 6 (August 2002).

21. Christopher Layne, “After the INF Treaty: A New Direction for America’s European Policy,” *Cato Institute Policy Analysis*, no. 103, April 21, 1988.

weapons that had been deployed to Europe. Although intermediate range forces were intended to provide assurance to NATO allies, their removal did not have a significant impact on the behavior of U.S. partners in Europe.²²

Nuclear Weapons and Contemporary Extended Deterrence

Since the end of the Cold War, tactical nuclear weapons have played a smaller role in U.S. extended deterrence guarantees. The bulk of U.S. tactical nuclear weapons were removed from Europe, and all weapons were removed from East Asia and surface naval vessels.²³ Nuclear weapons still play a role in extended deterrence, but as the most recent *Nuclear Posture Review (NPR)* and current debates in NATO and Northeast Asia demonstrate, their continued value is an unresolved question.

The 2010 *NPR* outlines a reduced role for U.S. nuclear weapons and places limits on the situations in which the United States would use them. Although the *NPR* does not rule out the first use of nuclear weapons on behalf of U.S. allies, it does limit the targets of nuclear weapons to states that are not in compliance with their obligations under the Nuclear Non-Proliferation Treaty (NPT).²⁴ In a further break from previous U.S. policy, the *NPR* also places limits on the use of nuclear weapons in response to biological and chemical attacks.²⁵ These restrictions limit the number of scenarios in which the United States would use nuclear weapons on behalf of its allies. Iran's continued noncompliance with its NPT obligations, however, would allow for a larger role for nuclear weapons in the context of a strategy for dealing with a nuclear Iran.

Despite the restrictions the *NPR* places on the use of nuclear weapons, the *NPR* does not represent a retreat from extended nuclear deterrence. Although the *NPR* does recommend the retirement of some nuclear-armed cruise missiles, it also recommends a life extension program for the B-61 nuclear warhead, the remaining U.S. tactical nuclear weapon.²⁶ The *NPR* also defers making a decision on the continued presence of tactical nuclear weapons in NATO countries.

The value of tactical nuclear weapons in ensuring the security of NATO has declined since the end of the Cold War. Because there are no obvious targets for the remaining tactical nuclear weapons in Europe, these weapons' contribution to European security is unclear. U.S. military leaders have acknowledged that these weapons in Europe have no military value.²⁷ The weapons have taken on a greater political value, however, serving as a symbol of America's commitment to Europe as well as a means whereby NATO

22. Ibid.

23. U.S. Department of Defense, *Nuclear Posture Review Report* (Washington, D.C.: U.S. Department of Defense, 2010), 32.

24. Ibid., 15.

25. Ibid., 16.

26. Ibid., 27.

27. General James Cartwright, Remarks at the Council on Foreign Relations, April 8, 2010, http://www.defense.gov/npr/docs/Council_on_Foreign_Relation.pdf.

partners can influence U.S. nuclear planning.²⁸ As NATO debates the future of tactical nuclear weapons in Europe, the controversy demonstrates the role of path dependence in evaluations of nuclear weapons. Once weapons have been deployed, it can be difficult to remove them, even if the threat environment has changed.

Removing U.S. nuclear weapons from Northeast Asia was an easier task than removing nuclear weapons from NATO has proven to be. Despite the fact that Northeast Asia is a far more challenging security environment than Europe, conventional forces have proven mostly adequate guarantors of U.S. extended deterrence. North Korea's decision to become a nuclear power did not have a significant impact on U.S. decision-making about the role of deployed nuclear weapons in the region, but the impact of recent North Korean provocations is being felt as some South Korean leaders demand the return of U.S. nuclear weapons to the peninsula.²⁹ It is unclear if the deployment of nuclear weapons to South Korea would have any real military value, but the recent shift in South Korean attitudes suggests that deployed nuclear weapons do have at least some perceived value in the contemporary security environment.

Evaluating Tactical Nuclear Weapons

The value of nuclear weapons in Cold War extended deterrence was relatively easy to calculate. In the contemporary era, however, changes in the security environment and shifting norms about the use of nuclear weapons have made this calculus more ambiguous.

Nuclear forces may prove to have financial advantages. One reason for U.S. reliance on nuclear weapons during the Cold War was because they provided “more bang for the buck” than conventional forces.³⁰ A relatively small number of nuclear weapons could supplant larger conventional forces and threaten the same targets. Smaller, nuclear forces would likely have a smaller footprint that would make force protection an easier obstacle to overcome. Although this advantage of nuclear forces has not been cited much since the end of the Cold War and the establishment of clear U.S. conventional superiority, it is clear that the U.S. defense budget will be affected by the new climate of fiscal austerity. Limited defense budgets may make nuclear weapons more attractive, as they were in the earlier stages of the Cold War.

Nuclear weapons serve as the ultimate foundation of all U.S. security commitments. Deployed tactical nuclear weapons may be more reassuring than strategic weapons in the U.S. homeland. Deployed nuclear forces provide a tripwire that would link the United States to its allies in the case of a nuclear exchange more closely than would a simple

28. Kingston Reif and Emma Lecavalier, “Parting Words: Gates and Tactical Nuclear Weapons in Europe,” *Bulletin of the Atomic Scientists*, July 14, 2011, <http://www.thebulletin.org/web-edition/op-eds/parting-words-gates-and-tactical-nuclear-weapons-europe>.

29. Duyeon Kim, “Tactical Nuclear Weapons and Korea,” Center for Arms Control and Non-Proliferation, June 2011, http://armscontrolcenter.org/policy/northkorea/articles/tactical_nuclear_weapons_and_korea/.

30. This was a major motivating factor in the Eisenhower administration's “New Look” defense strategy discussed above.

commitment. Recent developments in South Korean domestic politics, as well as the lessons learned from the failings of massive retaliation, suggest that nuclear extended deterrence may be more credible and assuring if tactical weapons are also available.

Although tactical nuclear weapons could give U.S. leadership an additional option, a strategy that is overly reliant on nuclear weapons, as is the U.S. massive retaliation strategy, risks leaving policymakers without good options to respond to lower levels of aggression. A threat to use nuclear weapons in response to conventional aggression is of questionable credibility, particularly due to shifting norms about the use of nuclear weapons since the end of the Cold War. And a strategy that places too great an emphasis on nuclear weapons to deter aggression may also fail to assure allies.

U.S. conventional forces enjoy a qualitative and quantitative superiority over Iran. Although shifting defense demands and smaller forces will reduce the total U.S. forces in the Middle East, they are still likely to retain this superiority, provided the United States develops the necessary capabilities to cope with Iranian asymmetric and anti-access strategies. Conventional weapons are also increasingly capable of taking on missions previously filled by nuclear weapons.³¹ The increased precision of conventional weapons allows them to destroy targets that would have previously required nuclear yields to destroy. Potential new standoff missile systems, along with systems such as Conventional Prompt Global Strike, would allow the United States to more credibly target Iranian nuclear forces and other high-value targets.

Deployed nuclear forces would also fail to address the indirect threats posed by Iran. For example, U.S. nuclear weapons would play little to no role in efforts to prevent Iranian subversion of U.S. allies in the region. Likewise, such weapons would be unlikely to deter the transfer of nuclear material to a nonstate actor if the material could not be credibly attributed to Iran. The deployment of U.S. nuclear forces could also raise the potential threat of nuclear theft and subsequent transfer to third parties. The U.S. Air Force has reported that security at a number of bases housing tactical nuclear weapons in Europe is insufficient, as evidenced by the recent incursion onto a Belgian base by protesters.³² The protection of bases in a volatile region like the Middle East could prove to be a more difficult task.

Missile defense systems also add a new factor to the U.S. deterrence calculus. Although missile defense was considered during the Cold War, it proved impractical and was restricted by treaty obligations. And though missile defense on a strategic level remains technically difficult, it has shown a great deal of promise on the theater and tactical levels. Missile defenses can play two roles—they can deter the use of nuclear and ballistic missiles by denial, and they can be positioned on allied soil to play an assurance

31. Philip E. Coyle and Todd Fine, “U.S. Nuclear Forces and Conventional Force Alternatives,” paper presented at Stanley Foundation 49th Strategy for Peace Conference, Airlie Center, Warrenton, Va., October 10–12, 2008, 3–5.

32. Reif and Lecavalier, “Parting Words,” 2011.

role.³³ Technological cooperation would be another way for the United States to assure its allies and develop new capabilities to respond to nuclear threats.

Deploying nuclear weapons may prove to have a mixed impact on nuclear proliferation. If America's security guarantees failed to assure its allies, they may prove insufficient to prevent these states from deciding to become nuclear powers. Although most U.S. allies in Europe and Asia chose not to acquire nuclear weapons, despite having the necessary technical and industrial infrastructure, one factor that motivated France to develop an independent arsenal was concern over the credibility of U.S. extended deterrence. Furthermore, part of the nuclear agenda laid out by the Obama administration is an effort to reduce the salience of nuclear weapons in allaying security concerns throughout the world.³⁴ This strategy has taken the form of reductions in the U.S. arsenal through New START along with the restrictions on use outlined in the 2010 *NPR*. Nuclear weapons deployed to a new region of the world would undermine this agenda and make other nonproliferation goals more difficult to achieve.

Tactical nuclear weapons have played an important role in U.S. extended deterrence strategies in the past, but their value is less clear in the contemporary security environment. U.S. conventional superiority and the development of new conventional weapons make much of the formerly unique value of tactical nuclear weapons of little consequence. Shifting norms about the use of nuclear weapons would likely undermine the credibility and assurance roles of U.S. nuclear guarantees. Extended deterrence guarantees that rely upon conventional forces to carry the bulk of the deterrent burden would be more credible and effective. And relying on conventional forces would also avoid the potentially threatening nuclear security and proliferation effects that deployed tactical nuclear weapons would create.

A Framework for Deterring Iran

Forward-deployed tactical nuclear weapons have little to no role to play in a U.S. extended deterrence regime in the Middle East. Although the United States' strategic nuclear forces would continue to be the ultimate guarantor of its commitments, much of the heavy lifting would be done by its conventional military forces. The United States, therefore, should focus on maintaining and developing the conventional capabilities required to deter Iran and assure its allies in the Middle East.

The United States will need to maintain and build conventional forces that can survive and operate in future combat environments. Iran is developing significant asymmetric warfare and antiaccess capabilities in the form of a large number of ballistic and antiship missiles that could threaten U.S. bases or naval forces.³⁵ Iran is also developing

33. U.S. Department of Defense, *Ballistic Missile Defense Review Report* (Washington, D.C.: U.S. Department of Defense, 2010), 12.

34. U.S. Department of Defense, *Nuclear Posture Review Report*, 7–8.

35. For greater detail on Iran's development of asymmetric and antiaccess technologies and strategies, see Anthony H. Cordesman and Adam Seitz, *Gulf Threats, Risks and Vulnerabilities: Terrorism and Asymmetric Warfare* (Washington, D.C.: Center for Strategic and International

large numbers of fast attack crafts and small submarines and also mine warfare capabilities that could also impede U.S. naval power projection. War games conducted by the U.S. military have demonstrated that such capabilities, if employed effectively, could severely restrict the United States' ability to operate in the region. Another challenge facing the United States is hardened and deeply buried targets. Iran has built a number of sensitive facilities, including nuclear enrichment facilities, underground in order to protect them against air strikes.³⁶ The United States will need to develop conventional systems that can operate in contested antiaccess environments and destroy hardened and buried targets if U.S. conventional forces are to deter Iran.

Although some analysts may advocate a reduced footprint for U.S. forces worldwide in the name of force protection and financial savings, the continued deployment of U.S. troops to the Middle East will be needed to deter Iran and assure American allies. Deployed U.S. forces represent a commitment of resources for potential use against Iran that is likely to enhance the credibility of deterrence policy. The deployment of America's forces to its allied states would serve as a tripwire force that would link the security of its forces to that of its allies and make intervention more likely in the case of Iranian aggression.

Missile defense will also play an important role in such a strategy. It will serve to protect U.S. forces deployed in the region and prevent them from simply being hostages to Iranian threats. Missile defense can also serve a deterrence-by-denial role and thus remove the incentive for Iran to use its missile or nuclear forces if they could be rendered ineffective by U.S. defenses. The United States should develop and construct missile defense systems that will be relevant to countering the threat from Iran, as outlined in the 2010 *Ballistic Missile Defense Review*.³⁷ Technical cooperation on missile defense technologies with allies would provide an opportunity to share the costs of development as well as to deepen cooperation and assurance between the United States and its partners.

Indirect threats from Iran should not be dismissed. Attempts to subvert allied states could potentially undermine the position of the United States in the region. Failures to prevent such provocations could, as in the case of recent events on the Korean Peninsula, result in a perception among its allies that America's guarantees have failed. Another more troubling, indirect threat is that of the transfer of nuclear weapons or materials to nonstate actors. The United States should continue its efforts to disrupt the networks that allow Iran to support organizations such as Hezbollah by preventing the shipment of weapons and the provision of financial support. The development of a nuclear forensics capability would allow the United States to credibly attribute the origin of nuclear materials or weapons used by terrorist organizations.³⁸ Being able to attribute such fissile

Studies, 2009), http://csis.org/files/publication/090827_gulf_terror_assym.pdf.

36. David Hambling, "Pentagon Scientists Target Iran's Nuclear Mole Men," *Wired*, January 12, 2010, <http://www.wired.com/dangerroom/2010/01/irans-nuclear-molemen/>.

37. U.S. Department of Defense, *Ballistic Missile Defense Review Report*, iv–vi.

38. Joshua Rovner, "Preparing for a Nuclear Iran: The Role of the CIA," *Strategic Insights* 4, no. 11 (November 2005).

material to Iran, and to threaten a credible response in case of such an event, would allow the United States to deter such a transfer.

Conclusions

Although nuclear weapons continue to serve as the foundation of U.S. national security, their role is increasingly being circumscribed by shifts in the international security environment and norms for the use of nuclear weapons. Tactical nuclear weapons deployed to the soil of U.S. allies played a key role in American extended deterrence guarantees during the Cold War, but the value of tactical nuclear weapons has eroded significantly since the collapse of the Soviet Union. If Iran becomes a nuclear power, U.S. conventional forces will shoulder the bulk of the deterrence role in the region. To pose a credible threat to Iran and to reassure its allies, the United States needs to develop forces that are usable in the Middle Eastern context. The United States must maintain forces that can operate in an antiaccess environment, defend against attacks by nuclear and ballistic missiles, and prevent the transfer of nuclear weapons to nonstate actors.

The Future of UK-U.S. Nuclear Weapons Cooperation: Opportunities and Implications

Matthew Harries

This paper seeks to sketch possibilities for the future of the UK-U.S. nuclear relationship, examining in particular new or expanded opportunities for cooperation. It identifies areas for fruitful future work, and explores the interaction between the UK-U.S. axis and potential trilateral collaboration with France. The paper recognizes a “passive” influence by the United States on British nuclear decisionmaking, but suggests that continued cooperation may offer significant mutual benefits. It further suggests that the nuclear relationship could make practical contributions, on the technical level and elsewhere, in tackling certain challenging aspects of contemporary nuclear policy, including nuclear terrorism, future arms control, and the implications of lower numbers of nuclear weapons.

Introduction

The strategic nuclear partnership between the United Kingdom and the United States is unique among nuclear-armed states. Alongside cooperation on intelligence, the formal components of the nuclear relationship allow for the transfer of materials, equipment, and information related to the most sensitive areas of national security. This partnership has lasted for more than 50 years, withstanding for the most part changing political climates between the two states, and is often identified as the primary material basis of the “special relationship.”

It is easy to take this relationship for granted. Yet the United States’ decision to provide the technical basis for the British deterrent was not uncontroversial at its genesis; over time, it has had significant strategic and political implications in Europe, and there are a number of reasons why in today’s context a review of the nature and purpose of U.S.-UK nuclear cooperation is needed. As Linton Brooks observes, “There is no inherent reason why cooperation must continue, no matter how close it has been in the past.”¹

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1. Linton Brooks, “The Future of the 1958 Mutual Defense Agreement,” in *U.S.-UK*

Because the details of nuclear cooperation are mainly secret, the breadth and depth of collaborative work in this field are an underexamined phenomenon. A good deal of British analysis on the U.S.-UK partnership, moreover, has been written through the prism of a debate about nuclear disarmament. This situation is not necessarily a failing—it is perfectly natural that, in a post-Cold War environment in which the United Kingdom has taken on a reduced global role, the rationale for maintaining the deterrent should be a subject of robust debate. However, the preoccupation with disarmament encourages a focus on the material ways in which the United States props up the British nuclear weapons establishment, through the provision of assistance in warhead design and materials, missiles, and to a lesser extent nuclear propulsion, at the expense of the broader spectrum of cooperation. As Admiral William Crowe, formerly U.S. ambassador to the United Kingdom, has remarked: “I have always described the relationship like an iceberg, in that there is a small tip of it sticking out, but beneath the water there is quite a bit of everyday business that goes on between our two governments in a fashion that’s unprecedented in the world.”²²

This paper seeks to sketch possibilities for the future of UK-U.S. nuclear cooperation, highlighting in particular new or expanded opportunities for collaboration. It suggests areas for fruitful future work, and explores the interaction between the UK-U.S. axis and potential collaboration with France. Broadly speaking, the paper argues that a “peer review” model can form the basis of a cooperative agenda with continued benefits for both sides, with limited but nevertheless significant opportunities for trilateral work. The paper recognizes a significant passive influence by the United States on the future of the British deterrent, and accepts that to some extent the history and practice of cooperation creates a bias against the pursuit of alternative nuclear options, including disarmament. Nevertheless, it argues that without a conscious British decision to pursue unilateral disarmament, the transatlantic nuclear partnership is likely to remain mutually beneficial for the foreseeable future. Moreover, nuclear collaboration could be pursued in ways that allow both countries to better adjust to current and future strategic circumstances, and to new threats, with lessons for each side not only in the core areas of historic cooperation but also on more dynamic aspects of the new nuclear agenda—including nuclear terrorism, technological aspects of future arms control, and the implications of lower numbers of nuclear weapons.

Nuclear Cooperation after 50 Years, edited by Jenifer Mackby and Paul Cornish (Washington, D.C.: CSIS, 2008), 152.

2. Richard Lister, “US and the UK: Special Relationship?” BBC News Online, February 23, 2001, <http://news.bbc.co.uk/1/hi/world/americas/1185177.stm>. Quoted by Nigel Chamberlain et al., “US-UK Nuclear Weapons Collaboration under the Mutual Defence Agreement: Shining a Torch on the Darker Recesses of the ‘Special Relationship,’” *BASIC Special Report 3* (2004): 20.

The Policy Framework

The structure of the UK-U.S. nuclear relationship has three main components. The 1958 Mutual Defence Agreement (MDA) provides for the transfer of classified information on nuclear weapons and propulsion; its Article III bis allows for the transfer of materials and equipment, and is renewed through 10-year rolling extensions, the most recent of which took place relatively quietly in 2004.³ The 1963 Polaris Sales Agreement (PSA), secured by Harold Macmillan's famous trip to Nassau, is the basis for the sale of drawing rights to United States-manufactured and -maintained missiles, as well as non-nuclear weapons components. The agreement was amended in 1980 to incorporate the sale of Trident C4, and again in 1982 to upgrade to Trident D5. Finally, there is a policy and operational dimension to institutional cooperation, through six-monthly nuclear staff talks, and the presence of UK officers as representatives of Supreme Headquarters Allied Command Europe (known as SHAPE) at U.S. Strategic Command (STRATCOM) headquarters in Omaha.

The day-to-day work of the nuclear relationship takes place through joint working groups (JOWOGs) and exchanges of information by visit or report (EIVRs). In response to a parliamentary written question in 2009, then-defence secretary John Hutton confirmed the existence of JOWOGs covering the following topics: radiation simulation and kinetic effects, energetic materials, nuclear materials, warhead electrical components and technologies, nonnuclear materials, nuclear counterterrorism technology, facilities, nuclear weapons engineering, nuclear warhead physics, computational technology, aircraft, missile and space system hardening, laboratory plasma physics, manufacturing practices, nuclear warhead accident response, nuclear weapon code development, nuclear weapon environment and damage effects, and methodologies for nuclear weapon safety assurance.⁴ Recent EIVRs have included nonproliferation and arms control technology, safety and security, and nuclear intelligence.⁵

Future Core Assistance: Trident, Submarines, and Warhead Replacement

What, then, might the future of U.S.-UK nuclear cooperation look like? The area of the nuclear relationship that has traditionally drawn the most attention is the provision of

3. "United States No. 1 (2004), Amendment to the Agreement between the Government of the United Kingdom of Great Britain and Northern Ireland and the Government of the United States of America for Cooperation on the Uses of Atomic Energy for Mutual Defence Purposes Washington, 14 June 2004," Presented to Parliament by the Secretary of State for Foreign and Commonwealth Affairs by Command of Her Majesty June 2004, Cm 6261, <http://www.acronym.org.uk/docs/0406/MDAamend.pdf>.

4. Her Majesty's Stationery Office, *Daily Hansard*, February 29, 2009, column 1149w, <http://www.parliament.the-stationery-office.co.uk/pa/cm200809/cmhansrd/cm090227/text/90227w0011.htm>.

5. See U.S. Department of Defense, *The Nuclear Matters Handbook* (Washington, D.C.: U.S. Department of Defense, 2011), 118, http://www.acq.osd.mil/ncbdp/nm/nm_book_5_11/docs/NMHB2011.pdf.

assistance by the United States on missiles, submarines, and warhead technology—the *raison d'être* of the MDA and PSA. The 2006 exchange of letters between then–prime minister Tony Blair and President Bush confirmed the United Kingdom's participation in the life extension program of the Trident D5. Assuming the United Kingdom decides to go ahead with Trident renewal (by building a successor to the Vanguard-class submarines), the United Kingdom will maintain drawing rights to a common pool of missiles at King's Bay, Georgia. Besides the obvious cost-savings in design, manufacturing and refurbishment, a key benefit for the United Kingdom of this arrangement is that, in addition to its own limited testing program, it can implicitly rely on the United States' flight test capacity.

With regard to cooperation on the successor submarines, two key questions emerge: first, whether the construction of a common missile compartment will take place in the United States (bringing savings for the United Kingdom, but presumably at a cost to the industrial base); and second, whether the United Kingdom will seek cooperation with France (on matters other than propulsion). The “initial gate” decision for the Vanguard replacement was made in May 2011, and confirmed that the successor submarine's reactor will be the new PWR3, which is United Kingdom–designed but reliant on U.S. technology.

A decision on replacing the United Kingdom's warhead will not take place in the life of this Parliament, but is likely to be due approximately at the time of the “main gate” Trident decision. The UK nuclear establishment is currently aiming to be in a “state of readiness” for this decision to be made, while broadly speaking keeping to the assumption that whatever option is pursued will be in alignment with U.S. plans.⁶ It was reported in 2009 that the United Kingdom had participated in the United States' RRW program; Congress has since withdrawn funding for RRW, and the U.S. national laboratories are now pursuing life extension programs instead, but the exact outcomes of these programs remain unclear.⁷ For its part, the United Kingdom is considering a number of options that might improve the safety and surety of its weapons, with not dissimilar features to RRW. For example, a larger Mk5 aeroshell or equivalent might assist the use of insensitive high explosives, and on this front lessons might be drawn from U.S. experience with the W88. Whatever solution is reached, it is reasonable to expect that nonnuclear components will continue to be supplied by the United States.

Future Cooperation: Technology and Policy

The areas of work discussed above are more accurately described as the provision of assistance by the United States to the United Kingdom, rather than as “cooperation.” Alongside this assistance, however, stands a broad agenda of work that more accurately fits the description of cooperation, some of which is already ongoing and some of which

6. From not-for-attribution conversations with UK officials with knowledge of the process.

7. Matthew Taylor and Richard Norton-Taylor, “US Using British Atomic Weapons Factory for Its Nuclear Programme,” *The Guardian* (London), February 9, 2009, <http://www.guardian.co.uk/world/2009/feb/09/us-uk-atomic-weapons-nuclear-power>.

is likely to expand in the coming years. This work rests on the concept of “peer review,” by which each side can contribute to the tackling of common or similar challenges. The model spans areas of technology and policy, and represents a more nuanced interaction than operates in the provision of missiles and materials under the MDA and PSA. As Linton Brooks has noted, this relationship may also be somewhat less one-sided than in previous years: for a variety of reasons, the UK nuclear establishment can now make relatively greater contributions in a number of areas.⁸

Technology

Staying closest to the core work of the MDA is continued cooperation in maintaining what the United States calls “science-based stockpile stewardship.” Here the two features of the cooperation agenda—peer review and an increased role for the United Kingdom—are much in evidence. Comparing similar but not identical warhead designs containing some common components allows for a broader data pool on—for example, the aging of various materials—and enables the two countries to combine scientific expertise in certifying warhead reliability, drawing on similar but not identical patterns of work. The United Kingdom’s resources—combined with a tradition of stewardship developed with much less access to explosive testing—could prove useful to the United States, especially, as Brooks notes, as budgetary pressures threaten the U.S. scientific base of the U.S. complex.⁹ In addition, data from British experiments at the new joint UK-French hydrodynamic/radiographic facility at Valduc should in theory be available to the United States.

A less traditional, though not entirely new, line of cooperative work that is likely to expand is research and technology related to countering nuclear terrorism. Most easy to identify through open sources are lines of work on nuclear forensics, detection, and incident response, and writing on past collaboration on neutralizing (simulated) discovered improvised nuclear devices (INDs) implies that such joint activities may also be ongoing.¹⁰ Countering nuclear terrorism is an international challenge, involving as it does the potential use of special nuclear material from a wide choice of sources, transportation of an IND across state borders, and wide-ranging implications for international security of a detonation (or in fact even the discovery of a device), made even more complicated by the challenges of attribution. This international dimension is evident, for example, in work conducted under the auspices of the International Atomic Energy Agency’s Nuclear Smuggling International Technical Working Group.

The provision for the transfer of sensitive information and materials under the MDA permits constructive cooperation in this field. Brooks notes that “one clear area for technical cooperation is in understanding the construction, detection and neutralization of

8. Linton Brooks, “Future,” 154.

9. *Ibid.*, 155.

10. Peter Hubbard, *The Exploding Kind*, unpublished memoirs, http://ccgi.racheldavid.plus.com/~racheldavid/images/stories/various/The_Exploding_Kind.pdf. The reliability of this source is unclear.

improvised nuclear devices.”¹¹ No other two nuclear weapon states could realistically share detailed information on potential IND designs, nor could they likely carry out significant joint exercises in this field. Further, the ability to share weapon characteristics facilitates collaboration on detection technology. The close nuclear relationship also allows for joint analytical exercises in determining the nature and origin of diverted special nuclear material, at a deeper level of technical sophistication than can be managed with other states through the International Technical Working Group.

Indeed, the United States and United Kingdom can collaborate on the full range of counter-nuclear terrorism issues: detection, neutralization, predetonation and postdetonation forensics, and postdetonation response. Michael Quinlan further suggests that the United States and United Kingdom should collaborate on compiling a “data bank about fissile material to heighten the likelihood that material used in a terrorist attack could be traced to the state from which—whether deliberately or through negligence—it had come.”¹² It seems reasonable to speculate that this would involve British contributions to existing U.S. assets. Lastly, Quinlan and Brooks both suggest that the United States and United Kingdom should work to develop responses to the IND threat in non-nuclear weapon states.¹³

As with most areas of U.S.-UK nuclear cooperation, description and analysis of this work is limited by the fact that it is conducted in secret (if at all). Nevertheless, it seems reasonable to speculate that under JOWOG 29, including the Nuclear Forensics Users Group, there is room for a great deal of collaborative work in this area. It is also worth emphasizing the importance of the U.S.-UK intelligence relationship in this field—it allows, for example, not only for technical forensics work but also for collaboration on the full scope of the attribution challenge. Again, the concept of “peer review” is highly relevant here—the United States and United Kingdom face similar challenges in this regard, and the United Kingdom has similar (albeit much smaller) capabilities in nuclear technology and intelligence.

Another field for collaboration is verification technologies for future arms control and disarmament agreements. The United Kingdom has been conducting research in this area at least since an 18-month study mandated by the 1998 Strategic Defence Review, which was followed by the establishment of an Arms Control Verification Research (ACVR) project.¹⁴ ACVR continues today under the National Nuclear Security Department at the Atomic Weapons Establishment (AWE), aiming “to develop methodologies and technologies to verify possible future nuclear disarmament agreements, in support of the United Kingdom’s commitment under the nuclear Non-Proliferation Treaty (NPT)

11. Brooks, “Future,” 156.

12. Michael Quinlan, “The Path Ahead for Nuclear Cooperation,” in *U.S.-UK Nuclear Cooperation*, ed. Mackby and Cornish, 164.

13. *Ibid.*; Brooks, “Future,” 156.

14. Garry J. George and Martin D. Ley, “Nuclear Warhead Arms Control Research at AWE,” in *Verification Yearbook*, edited by Trevor Findlay and Oliver Meier (London: VERTIC, 2001), 190, http://www.vertic.org/media/Archived_Publications/Yearbooks/2001/VY01_George-Ley.pdf.

Article VI.”¹⁵ A range of similar programs exist in the United States, where it is widely recognized that a further bilateral arms control agreement with Russia dealing with nondeployed and/or nonstrategic nuclear weapons will require verification of warheads themselves, which involves a range of technical challenges, particularly in warhead authentication. The level of commitment of the present UK government to arms control and disarmament relative to its predecessor is not yet entirely clear—nevertheless, this field was identified by Gerald Howarth, minister for international security strategy, as an area for closer UK-U.S. collaboration.¹⁶

The results of such collaboration could be communicated to two audiences: the other recognized nuclear weapon states, through the newly established consultations among the five nuclear powers under the NPT on confidence-building measures toward nuclear disarmament; and the non-nuclear weapon states, in the context of the NPT review cycle. In the likely absence of another formal U.S.-Russian arms control agreement before the 2015 NPT Review Conference, and with the Comprehensive Test Ban Treaty not in force and the Fissile Material Cutoff Treaty project continuing to face significant barriers to implementation, such efforts would be an important demonstration of the two nuclear powers’ commitment to their Article VI commitments. This effort could take the form both of formal briefings and side events at NPT Preparatory Committees and the Review Conference, perhaps with a role for nongovernmental organizations (as was done in the case of the UK-Norway Initiative on Dismantlement Verification).

Policy

As noted above, the nuclear relationship extends in terms of structures to cover not only technology but also policy, in the form of the nuclear staff talks. Beyond the fact that the talks cover broad deterrence issues and the implications of ballistic missile defenses, little information is publicly available on their content. In a general sense, however, as Brooks notes, “the 1958 agreement is not a prerequisite for quiet, candid discussions on nuclear policy, but the channels it establishes and the personal relations it fosters makes such discussions easier and more fruitful.”¹⁷ A number of potential topics for such discussions can be imagined.

First, the Obama administration is currently conducting a review of nuclear targeting policy. The United Kingdom was briefed on the results and lessons learned from the overhaul of the U.S. Single Integrated Operational Plan in 1989–1991, so it is reasonable to speculate that the same might happen during or after the current review.¹⁸

15. “UK Arms Control Verification Programme,” UK Ministry of Defence Briefing Paper, March 29, 2010, http://www.mod.uk/NR/rdonlyres/9BCA758E-16C9-47BC-A93F-FAD01DCDE3D3/0/uk_arms_control_verification_programme.pdf.

16. Gerald Howarth, “1958 UK/US Mutual Defence Agreement Stocktake,” speech to 35th Annual MDA Stocktake, July 26, 2011, <http://www.mod.uk/DefenceInternet/AboutDefence/People/Speeches/MinISD/201107261958UkusMutualDefenceAgreementStocktake.htm>.

17. Brooks, “Future,” 155–156.

18. Franklin C. Miller, “Creating a Bilateral Nuclear Policy Framework,” in *U.S.-UK Nuclear Cooperation*, ed. Mackby and Cornish, 176.

In the context of these discussions, one particularly useful topic for joint thinking would perhaps be to elaborate the concept of “tailored deterrence.” The concept first appeared in the 2006 U.S. *Quadrennial Defense Review (QDR)* and the 2006 Deterrence Joint Operating Concept, which called for “deterrence strategies and operations tailored to address their unique decision-making attributes and characteristics under a variety of strategically relevant circumstances.”¹⁹ It has since been incorporated into policy by the Obama administration, appearing in similar form in the 2010 *QDR*.²⁰ Leaving aside debates about whether introducing “tailored deterrence” implies an expanded role for nuclear weapons, at the heart of this issue is a question that applies equally to the United States and United Kingdom, notwithstanding the differences in the sizes and roles of their respective arsenals—namely, how to deter new nuclear powers. Frank Miller relates that the initiation of nuclear staff talks revealed that the United States and United Kingdom had held different views on the value system of the Soviet leadership, based on different assumptions, and that the resulting exchange of views served to enrich “the tapestry of shared knowledge” between the two sides on the nature of deterrence.²¹ A similar process could be imagined with regard to the assumptions behind deterring, for example, a future nuclear-armed Iran. Again, U.S.-UK collaboration on intelligence might also lend weight to the outcomes of this process.

Given both sides’ stated commitment to the goal of nuclear abolition, nuclear policy discussions between the United States and United Kingdom, whether in the context of staff talks or elsewhere, could usefully explore the implications of deep reductions in nuclear arsenals, and other problematic issues along a future path to “zero.” Sir Michael Quinlan proposed a range of issues that such discussions could cover, including changes to declaratory policy, increases in transparency, and reductions in alert levels, concluding that “formal renunciation of options might not be possible,” but that “there is a case . . . that deterrence concepts, operational doctrine, and force provision should be geared essentially to sending a final political warning to discourage an offending regime from continued aggression, and thereafter—in the very last resort—to rendering it unable or very unlikely to reoffend.”²² More prosaically, one task that might be completed in the relatively short term would be to agree to a shared bilateral glossary of nuclear terms to facilitate progress toward that goal among the five nuclear powers that are also permanent members of the UN Security Council, as agreed upon at the meeting on confidence building measures toward disarmament in Paris in July 2011.²³

19. U.S. Department of Defense, *Deterrence Operation Joint Operating Concept*, Version 2.0, December 2006, 44, http://www.dtic.mil/futurejointwarfare/concepts/do_joc_v20.doc.

20. See U.S. Department of Defense, *Quadrennial Defense Review Report*, February 2010, 14, http://www.defense.gov/qdr/images/QDR_as_of_12Feb10_1000.pdf.

21. Miller, “Creating,” 175.

22. Quinlan, “Path Ahead,” 169.

23. “First P5 Follow-up Meeting to the NPT Review Conference (Paris, June 30th–July 1st, 2011),” Statement by the Spokesperson of the French Ministry of Foreign and European Affairs, July 1, 2011, <http://www.franceonu.org/spip.php?article5660>.

Nuclear disarmament has traditionally been an “outsider narrative”—a demand made by non-nuclear weapon states or sections of the domestic public. Although political pressure is of course one likely ingredient in encouraging disarmament progress, a wide variety of obstacles to disarmament are not simply raised by a lack of political will, but instead are complicated problems of national security and international stability. A nonexclusive list of possible sources of instability at lower numbers of nuclear weapons includes first-strike instability, imbalances in conventional forces, conflicts between transparency and survivability, strategic effects of ballistic missile defense, reduced credibility of extended deterrence, and the increasing salience of other weapons of mass destruction. With these in mind, it can be argued that for the nuclear disarmament movement to succeed, it must “speak the language” of deterrence—that is to say, it must take seriously the traditional security concerns of nuclear weapons possessors, and present routes to lower numbers of nuclear weapons that are compatible with those concerns.²⁴ In this sense, a serious dialogue on nuclear disarmament in the U.S.-UK context, where there is a high degree of mutual trust, and a sense of common interests and common concerns, could be of great value.

Trilateral Cooperation

In November 2010, the United Kingdom signed a broad-ranging defense cooperation treaty with France, which included a subsidiary agreement on nuclear cooperation. This agreement consisted primarily of a plan to build a joint hydrodynamic facility at Valduc, but it laid the framework for cooperation on stockpile certification, the safety and security of nuclear weapons, and countering nuclear and radiological terrorism. With this agreement in place, there are now nuclear weapons cooperation accords along all three sides of the three-power (P3) “triangle,” although the United States–France and United Kingdom–France sides remain considerably weaker. This policy framework, and—perhaps more important—strategic shifts during the last two decades suggest that some level of trilateral nuclear cooperation is feasible, and indeed likely to take place.

The potential for such cooperation arises from three broad factors. The first is UK-French defense rapprochement; for the United Kingdom, cooperation with France or the United States is no longer seen as a mutually exclusive choice, whereas the ferocity of France’s opposition to U.S. influence in Europe has weakened. Etienne de Durand describes this broad trend as the “end of the Suez paradigm”—meaning that the shape of transatlantic relations is no longer dominated by the sharply divergent lessons drawn by the United Kingdom and France after the humiliation of 1956.²⁵ Second, historic U.S. objections to UK-French collaboration have declined; the signing of a United States–France nuclear agreement in 1995 somewhat lessened concerns about the possibility of sensitive information being transferred in UK-French interactions—but, more impor-

24. See Christopher Hobbs and Matthew Harries, “Deterrence,” in *Handbook of Nuclear Proliferation*, edited by Harsh Pant (London: Routledge, 2011).

25. Etienne du Durand, *Entente or Oblivion: Prospects and Pitfalls of Franco-British Cooperation on Defence*, RUSI Future Defence Review Working Paper 8 (London: Royal United Services Institute, 2010), 7–8, <http://www.rusi.org/downloads/assets/FDR8.pdf>.

tant, the Cold War context in which nuclear collaboration was highly salient in manipulating transatlantic geopolitics no longer applies. Third and last, the three powers face a number of common challenges in the nuclear field, to which trilateral cooperation might provide some (admittedly limited) solutions.

In the technological field, some form of cooperation on stockpile stewardship issues and counter–nuclear terrorism seems feasible, albeit at a lower level of detail than in the U.S.-UK arena. A potentially more expansive avenue for trilateral cooperation may emerge in the policy arena. With NATO attempting to embark on a review of its deterrence and defense posture, there would be practical advantages in including France in discussions about the role of nuclear weapons in the defense of the alliance. The normal political sensitivities would seem to preclude French reentry into the Nuclear Planning Group; however, such discussions could perhaps take place quietly on a trilateral basis. Trilateral talks could also address possible responses to a nuclear-armed Iran, including a private debate on the wisdom of extending nuclear deterrence to Israel or the Gulf states. More broadly, and perhaps in a forum similar to UK-U.S. staff talks, the P3 could discuss the role of nuclear weapons in contemporary national security, and matters of doctrine. Nuclear staff talks already take place between the United Kingdom and France, although details about their scope and content are not readily available.

There are, of course, limits to the ambitions of trilateral nuclear cooperation. Anything perceived to compromise the independence of the French deterrent would be untenable in the domestic political arena, and UK officials would presumably be reluctant to sacrifice their position as the United States' privileged nuclear ally. Nevertheless, as Gerald Howarth recently remarked, “engagement between the P3 nations on nuclear deterrence is likely to become increasingly active.”²⁶

The Nuclear Relationship's Passive Influence

Although this cooperative UK-U.S. agenda seems to offer practical benefits for both sides, it is worth considering its side effects, particularly for the United Kingdom. In the abstract, nuclear weapons can be considered a matter for purely strategic decision-making—they may be regarded as the ultimate guarantor, as compensation for conventional military weakness, as instruments of coercion or enablers of aggression, and so on. However, the scientific, technical, manufacturing, and industrial challenges involved in producing, maintaining, and replacing these weapons are so great that the timing of such decisions is usually determined by technological life cycles, procurement timetables, and budgetary pressures, rather than changes in the strategic environment. Further, a state's options at these moments of decision may often be very limited.

Keeping this in mind, two features of the United Kingdom's nuclear weapons program become particularly salient. First, the United Kingdom relies on a nuclear “monad”—a single delivery system, Trident D5 missiles on submersible ships—ballistic missile—nuclear powered (SSBNs), with a single warhead type. This is not the case in any

26. Howarth, “1958 UK/US Mutual Defence Agreement Stocktake.”

of the other NPT nuclear weapon states. Second, the United Kingdom has always had a relatively prominent lobby for nuclear disarmament, not only among the general public but also at the elite level, ranging from Labour Party unilateralism in the early 1960s and mid-1980s to contemporary Liberal Democrat opposition to Trident replacement. This situation allows two observations to be made—first, that each decision point in the life cycle of the British deterrent is an occasion for debate about the nature, purpose, and necessity of the deterrent as a whole; and, second, that the United Kingdom’s limited options mean that the fact of American assistance is highly significant in establishing the boundaries of these debates. In other words, the United States wields considerable passive influence on the whole range of British nuclear decisionmaking.

Specifically, the history and current practice of cooperation has resulted in the default preference of the British nuclear weapons establishment being to maintain commonality with the United States. This effect is particularly evident with regard to the United Kingdom’s nuclear warhead, whose current manifestation is widely reported to be very similar to the U.S. W76. Broadly speaking, this preference is derived from past experience of periods during which the United Kingdom’s systems were not aligned with the United States—in particular, the budget overruns and political controversies associated with Chevaline, and the expense of reopening motor production lines for Polaris once the missile had been withdrawn from service in the United States.²⁷ The preference for commonality is manifested in production of shared components, such as the common missile compartment for Trident or nonnuclear warhead parts, similarity of warhead design, and in the timing and parameters of procurement decisions.

In practice, this situation likely demonstrates that the UK nuclear establishment, particularly at the technical level, is somewhat biased in favor of maintaining a deterrent based on Trident D5 missiles on SSBNs. Any other option would entail significant disruption to the working relationship with the United States, if not an outright break. In that sense, the United Kingdom faces its current Trident decision not entirely from a neutral vantage-point—on this basis, Nick Ritchie argues that the “wider opportunity costs [of nuclear collaboration] go unquestioned and unexamined.”²⁸ It is further asserted that cooperation with the United States has led the United Kingdom into unnatural choices with regard to the shape of own program in other areas: John Ainslie alleges that “research work at AWE has been distorted by the desire to retain the special relationship with the U.S. . . . The UK could adopt lower criteria for the yield, surety and reliability of its nuclear weapons than those used by the U.S., [and] there could be significant reductions in workload and capabilities at AWE if the attempt to keep in step with the American laboratories were abandoned.”²⁹

27. Tara Callahan and Mark Jansson, “UK Independence or Dependence,” in *U.S.-UK Nuclear Cooperation*, ed. Mackby and Cornish, 132–133.

28. Written testimony to House of Commons Foreign Affairs Committee, “Global Security: UK-US Relations,” Sixth Report of Session 2009–10, March 18, 2010, p. Ev. 97.

29. John Ainslie, “Changing the Atomic Weapons Establishment,” discussion paper for Stepping Down the Nuclear Ladder: Options for UK Nuclear Weapons Policy, Workshop at the Department of Peace Studies, University of Bradford, Bradford, September 17–18, 2009.

Broadly speaking, it is true that the shape of UK policy is affected by the demands and incentives of working with the United States. One cost of collaboration might well be the need to keep pace with higher requirements than the United Kingdom might in the abstract choose for itself (although on the matter of surety and reliability, the case for lower requirements is harder to make)—and certainly a key question for further research is whether cooperation with the United States inhibits the pursuit of cost-saving Trident-based options, particularly the potential for a fleet of only three submarines. On the broader question of Trident replacement, however, it is not clear that there is a bias derived from cooperation with the United States that is as significant as, for example, the industrial and technical efficiencies involved in purchasing from the United States (as opposed to indigenous development or cooperation with France). Moreover, the definition of what constitutes “distortion” of the British program rather depends on perception—that is, whether or not one values the benefits of cooperation that derive from maintaining commonality between the two programs.

Whether nuclear cooperation has an influence on the broader sweep of UK foreign policy as a whole is a matter for speculation. John Baylis records that in the early decades of the nuclear relationship, the United States “sought, with some success, to link cooperation in the nuclear field with broader British support for U.S. foreign policy objectives.”³⁰ Nick Ritchie has gone much further, arguing that “the UK is, in fact, in a circular nuclear relationship with the United States in which it deems it essential to deploy strategic nuclear forces to reinforce and reproduce its role and commitment as the United States’ primary political and military ally... whilst at the same time being highly dependent upon the United States for the provision and operation of its nuclear capability.”³¹ However, this argument seems to overstate both the strategic value of the United Kingdom’s nuclear weapons to the United States, and the influence of nuclear weapons as a factor in the United Kingdom seeking to maintain a strong bilateral relationship. As Malcolm Chalmers observed in testimony to the House of Commons Foreign Affairs Committee, “there are a number of different factors preventing the UK from going in a fundamentally different direction from the U.S.; . . . maybe [nuclear cooperation] adds a little to the picture but it doesn’t seem to be fundamental.”³²

This being the case, it would seem that U.S.-UK nuclear relationship remains largely a symptom, not a cause, of the UK government’s opposition to disarmament. That is to say, once the decision to keep the British strategic deterrent has been taken (or not reversed), alignment with the United States to maximize the benefits of cooperation seems to be a matter of common sense.

It is worth noting, of course, that the contested relationship between nuclear collaboration and the direction of British policy is by no means a new debate—indeed, it has its roots in transatlantic politics of the early 1960s. The shape of the British nuclear deter-

30. John Baylis, “The 1958 Anglo-American Mutual Defence Agreement: The Search for Nuclear Interdependence,” *Journal of Strategic Studies* 31, no. 3 (2008): 456–457.

31. Written testimony to House of Commons Foreign Affairs Committee.

32. House of Commons Foreign Affairs Committee, “Global Security: UK-US Relations,” Sixth Report of Session 2009-10, March 18, 2010, 48.

rent as we understand it today was secured in December 1962, when Harold Macmillan flew to Nassau, in the Bahamas, to meet President John F Kennedy. Robert McNamara's Department of Defense had just cancelled Skybolt, the air-launched ballistic missile system which the United States had committed to sell to the United Kingdom, after the cancellation of Blue Streak. At Nassau, Macmillan played somewhat brazenly on the memory of decades of wartime alliance and common cultural inheritance in persuading Kennedy to promise the UK Polaris, which ended up being deployed on British submarines from 1968 until the mid-1990s, when it was replaced in service by Trident.

Kennedy's decision was a repudiation of the State Department's Europeanists, who saw the United Kingdom as a spent international force—in particular, this was a missed opportunity to bind the United Kingdom into joining a NATO multilateral force.³³ According to George Ball, then-U.S. undersecretary of state, Nassau encouraged the United Kingdom to keep on thinking of itself as a great power, and “deflected her from coming to terms with her European destiny.”³⁴ There was indeed a cost to Europe: the Polaris deal confirmed De Gaulle's suspicions that Britain's instincts were transatlantic rather than European, and France vetoed British entry into the EEC in January 1963.

In some respects, similar considerations apply today. In a post-Cold War international order, facing post-9/11 security threats, dealing with post-Iraq isolationism in domestic politics, and, most of all, feeling severe economic pressure—there is debate over the United Kingdom's global role. In 2010, the incoming coalition government conducted a Strategic Defence and Security Review (SDSR), which, while insisting that British international ambitions would not be scaled back, was aimed at reordering strategy in pursuit of cost savings. Although the decision to renew Trident was not up for debate in the SDSR, the Conservative-Liberal Democrat coalition agreement promised scrutiny of the Trident option in terms of value for money. In this context, the United States' continued willingness to provide nuclear assistance to the United Kingdom is a choice (albeit tacit) once again to reject the theory that the United Kingdom should accept a lower standing and be pushed toward Europe. Conversely, opposition in the United Kingdom to reliance on American nuclear assistance often draws on uneasiness about the effects of transatlantic cooperation on the way the United Kingdom positions itself in the international system.

Conclusion

As the preceding paragraphs have explored, UK-U.S. nuclear cooperation is not an entirely neutral phenomenon. It has at least the potential to influence the United Kingdom's nuclear choices, and perhaps the broader sweep of British national strategy, although the nature and extent of that influence remains very much an open question. Aside from these

33. Alastair Horne, “The Macmillan Years and Afterwards,” in *The “Special Relationship”: Anglo-American Relations since 1945*, edited by Louis and Bull (Oxford: Oxford University Press, 1986), 97.

34. George Ball, *The Discipline of Power: Essentials of a Modern World Structure*, 1st ed. (London: Atlantic Monthly Press, 1968), 107.

questions, however, there is a collaborative agenda encompassing many of the pressing technical and policy challenges facing nuclear weapon states today. This paper has highlighted a range of areas where cooperative work is either ongoing or likely to take place, including stockpile stewardship, responses to nuclear terrorism, and technical aspects of future arms control, as well as the reshaping deterrence to contemporary threats, and the management nuclear reductions. It has further suggested that bilateral cooperation might be expanded to include France in those areas in which the three Western nuclear powers face common challenges, with a particular opportunity to discuss nuclear policy outside the politically sensitive arena of the NATO Nuclear Planning Group.

As noted at the start of this paper, the details of the work taking place in the bilateral arena remain largely secret, which can intuitively be justified on grounds of national security. However, the scope and purpose of such work should be a matter for open discussion and analysis. Of particular interest are those fields of cooperation that may assist both countries in adjusting to the challenges of a post–Cold War nuclear environment. Here, a dialogue at both technical and policy levels in an atmosphere of relative trust could continue to offer mutual benefit, and might serve as one means to address the deficit of new thinking and new solutions in the contemporary nuclear weapons policy arena. Colin Gray’s discussion of nuclear fallacies in *The Second Nuclear Age* promised a spirit of discussion that was “sceptical, irreverent, unapologetic, and yet deeply serious about the emerging perils to national and international security posed by weapons of mass destruction.”³⁵ Such a spirit ought to be achievable in discussions between the United Kingdom and the United States, and, if properly managed, it ought to contribute to both countries’ pursuit of responsible nuclear weapon statehood in a changing international environment.

35. Colin S. Gray, *The Second Nuclear Age* (Boulder, Colo.: Lynne Rienner, 1999), 4.

The Next Generation of 123 Agreements

Laura Berzak Hopkins

Governed by language in the Atomic Energy Act of 1954, “123 Agreements” are a necessary precondition for civilian nuclear cooperation between the United States and another state or entity. The United States currently has agreements with 27 states and entities, ranging from Australia and Euratom to India and Russia, each of which had to meet a series of criteria. Although such agreements are often economically and diplomatically beneficial, they can also be fraught with proliferation concerns and political challenges. These concerns and challenges have changed over the decades and raise the question of whether the framework for nuclear cooperation developed decades ago is suited for today’s political and technological environment. This paper discusses potential benefits and pitfalls of these 123 Agreements with specific examples drawn from agreements with Russia, India, and the United Arab Emirates. These examples are compared with potential agreements with Jordan and Vietnam, and these comparisons are linked to a discussion of possible changes to the legislating language to guide future agreements.

Overview

What are called 123 Agreements authorize and delineate the framework for bilateral civilian nuclear cooperation between the United States and a foreign state or entity. Though not guaranteeing cooperation, a 123 Agreement is a prerequisite for all significant nuclear cooperation. Such cooperation includes the transfer of special nuclear material, subject to Nuclear Regulatory Commission export licensing, for commercial, medical, or industrial purposes as well as the transfer of equipment for reactors larger than 5 megawatts electric. Special nuclear material is precisely defined as plutonium, uranium enriched in the isotopes of 233 or 235, and any other material enriched in the previous elements, but does not include source material.

These 123 Agreements draw their legislative authority from Section 123 of the U.S. Atomic Energy Act, which is the fundamental U.S. law governing civilian and military uses of nuclear material. The original version of the act was enacted in 1946 and was the first U.S. legislation governing nuclear weapons and nuclear power. The act was

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substantially amended in 1954 (PL 83-703) to include increased support for the civilian nuclear industry and again by the Nuclear Non-Proliferation Act of 1978 (PL 95-242) to include more stringent safeguards requirements for nuclear exports.

The 123 Agreements are considered to be congressional–executive agreements because they are subject to approval requirements from both the legislative and executive branches of the U.S. government. Negotiated by the executive branch, 123s require the Department of State to submit to the president, who in turn submits to Congress, a Nuclear Proliferation Assessment Statement (NPAS) and an associated classified annex. The president also submits to Congress the text of the proposed agreement with the written determination “that the performance of the proposed agreement will promote and will not constitute an unreasonable risk to, the common defense and security.”¹

For a *nonexempt* 123 Agreement, the NPAS must describe how the terms of the proposed text meet the nine nonproliferation criteria outlined in the U.S. Atomic Energy Act. These requirements vary between recognized nuclear weapon states and non–nuclear weapon states and are:

- Safeguards on any transferred nuclear material and equipment must continue in perpetuity.
- Full-scope International Atomic Energy Agency (IAEA) safeguards must be maintained on all nuclear materials for non–nuclear weapon states.
- None of the material, equipment, or technology transferred can be used for any nuclear explosive device or other military purpose.
- Except for 123 Agreements with nuclear weapon states, the United States retains the right to demand the return of materials if the state detonates a nuclear explosive device or abrogates IAEA safeguards.
- There can be no retransfer of material or restricted data without prior U.S. consent.
- Physical security on nuclear material must be maintained.
- There can be no enrichment or reprocessing of transferred material (U.S. origin material) or material generated using transferred equipment or technology without prior U.S. consent.
- Storage for nuclear material must be approved by the United States in advance.
- Any material produced or facility constructed through the nuclear cooperation agreement is subject to all the previous provisions.²

If the president determines that any of these requirements would be “seriously prejudicial to the achievement of U.S. nonproliferation objectives or otherwise jeopardize the common defense and security,” then he or she can exempt the 123 Agreement. An

1. *Atomic Energy Act of 1954*, PL 83-703, U.S. Statutes at Large 68 (919).

2. *Ibid.*

exempt agreement, however, requires a different series of approval procedures, as described below.

After transmission of the NPAS, its classified annex, and proposed text, Congress has a period of 90 days of continuous session to review the proposed 123 Agreement, where a “continuous” session is defined by the congressional calendar. Therefore, 90 days of continuous session is typically much longer than 90 calendar days and can extend many months. If after this period of review Congress has not adopted a joint resolution of disapproval that becomes law, then the agreement goes into effect. For exempt agreements, Congress must pass a joint resolution of approval, which becomes law in order for the agreement to go into effect.

Purpose

Parties can pursue and conclude 123 Agreements for a variety of reasons, including economic self-interest.³ By increasing the number of countries with which the United States is permitted to engage in civilian nuclear cooperation, the market for U.S. nuclear reactor technology, equipment, and plant parts is correspondingly increased. A larger international market is particularly important for the U.S. nuclear reactor equipment industry because the United States has not broken ground on the construction of a new nuclear plant in more than 30 years. Without a new market for reactor parts, the domestic industry cannot be supported. A 123 Agreement presents the opportunity to maintain and perhaps grow the domestic nuclear reactor equipment industry and to utilize domestic technology during this time of a lack of desire or ability to grow the domestic nuclear power plant contingent.

Nonproliferation interests also drive the United States to pursue a 123 Agreement. If the United States plays a role in a state’s nuclear program, it may be able to guide the program in a desired direction—a view from the inside as a collaborator may permit the United States to better understand the development of a state’s nuclear program. A 123 also presents the opportunity to share U.S. technology—for example, U.S. light water reactor technology, which is considered more proliferation resistant than Canada’s CAND-U reactor.

Furthermore, there can be diplomatic and political reasons to conclude a 123 Agreement. Such an agreement may demonstrate U.S. goodwill toward a state and may present the opportunity to reset, rebuild, or even begin a relationship. Hence, a 123 can assist with developing a strategic partnership and with advancing a political agenda.

The United States currently has 27 123 Agreements with the following states and entities: Argentina, Australia, Bangladesh, Brazil, Bulgaria, Canada, China, Colombia, Egypt, Euratom (the European Atomic Energy Community), India, Indonesia, the IAEA, Japan, Kazakhstan, Morocco, Norway, Romania, Russia, South Africa, South Korea,

3. U.S. Government Accountability Office, *Nuclear Commerce*, Report to the Committee on Foreign Affairs House of Representatives, Report GAO-11-36 (Washington, D.C.: U.S. Government Printing Office, 2010).

Because Congress had not adopted a joint resolution of disapproval, the agreement was considered approved.

In justifying its resubmission of the 123 Agreement, the Obama administration cited Russian support for UN Security Council sanctions against Iran, the negotiation and signature of New START, joint support for the Global Initiative to Combat Nuclear Terrorism, and the signature of the Protocol to Amend the 2000 United States–Russia Plutonium Management and Disposition Agreement.⁵ In addition, the U.S. administration endorsed Russia’s plan to establish an international nuclear fuel reserve. Such a fuel bank would store and reprocess spent fuel as well as enrich uranium for fresh fuel, with all activities under international safeguards. The existence of a bank providing “cradle to grave” fuel cycle services could assist in removing the incentive for countries to pursue independent enrichment and reprocessing technology.⁶

President Obama has indicated that this 123 Agreement represents a “reset” of the U.S.-Russian relationship from nuclear rivals to nuclear partners, with the intent to improve cooperation on nuclear terrorism prevention, nonproliferation, and the development of new nuclear energy and safety technology.⁷ The agreement also improves the prospects for the Russian nuclear fuel bank, which could not legally collect U.S.-origin nuclear material from third-party countries without a 123 in place. The 123 may also present the opportunity for the United States to gain insight from Russian advanced fuel cycle research and development, while allowing Russia to gain access to U.S. nuclear safety technology and standards.

Although perhaps promising for future United States–Russia relations, the associated 123 has several outstanding concerns. The first is the liability coverage of U.S. nuclear companies pursuing business in Russia. Although Russia is a party (since 2005) to the Vienna Convention on Civil Liability for Nuclear Damage,⁸ the Russian nuclear company Rosatom Corporation enjoys sovereign immunity as a partially state-owned entity, and Russia has not ratified or signed the Convention on Supplementary Compensation (CSC).⁹ As a result, there is substantial uncertainty about the division of financial

5. The Plutonium Management and Disposition Agreement details the terms of the disposal of 34 metric tons of excess weapons plutonium in each country.

6. Mary Beth Nikitin, *U.S.-Russian Civilian Nuclear Cooperation Agreement: Issues for Congress* (Washington, D.C.: Congressional Research Service, 2008), <http://www.fas.org/sgp/crs/nuke/RS22892.pdf>.

7. Rose Gottemoeller, Steven Pifer, and Micah Zenko, “Next Steps in U.S. and Russian Nuclear Cooperation,” Meeting Transcript, Council on Foreign Relations, January 13, 2011, <http://www.cfr.org/united-states/next-steps-us-russian-nuclear-cooperation/p23799>.

8. The Vienna Convention is a national liability regime that channels liability for a nuclear accident exclusively to the operator and indemnifies the equipment manufacturer, among other related issues, e.g., establishing a limited time frame and monetary amount for compensation.

9. The CSC would establish a global framework for nuclear liability, such that damages not covered by a national compensation system (e.g., the Vienna Convention or, in the United States, the Price-Anderson Act) would be covered by a global fund to which all parties to the CSC contribute. Contributions are determined by a formula based on each party’s installed nuclear capacity. Proponents of the CSC assert that this system is beneficial to U.S. companies exporting

liability and responsibility between the plant operator, which may have immunity, and the plant equipment supplier in the event of a nuclear accident. Because of this uncertainty, U.S. companies are hesitant to supply equipment to Russian reactors.

Other concerns focus on whether, because Russia pursues reprocessing, the 123 Agreement signifies an implicit approval of reprocessing as part of the future of nuclear energy. Although the United States opposes reprocessing on proliferation grounds, Russia sees it as an important part of its nuclear industry. There is also apprehension regarding whether the agreement may be construed as U.S. approval for Russia's civilian nuclear industry, which continues to have safety and environmental problems.

Clearly, there are both positive and negative considerations associated with the United States–Russia 123 Agreement. However, whichever view is taken, the agreement definitely marks a change in relations toward enhanced cooperation.

The United States–India 123 Agreement

Because of India's status as a de facto nuclear weapon state (rather than a recognized nuclear weapon state), the United States–India 123 Agreement has a unique history coupled with unique concerns and prospects. There are five recognized nuclear weapon states, defined in the Nuclear Non-Proliferation Treaty (NPT) as a state that exploded a nuclear device before January 1, 1967. These states are the United States, Russia, the United Kingdom, France, and China. However, India exploded self-described “peaceful” nuclear devices in 1974 and 1998. Moreover, India is neither a party to the NPT nor has IAEA safeguards on all domestic nuclear material. Given this history, the United States halted nuclear exports to India while convincing other states to do the same and, in 1974, developed the Nuclear Suppliers Group (NSG) to delineate greater restrictions on nuclear trade.

This attitude toward India altered under U.S. president George W. Bush, who sought to achieve civil nuclear cooperation between the United States and India. In 2005, Indian prime minister Manmohan Singh and Bush issued a joint statement declaring that India would separate its civilian and military nuclear facilities and would place its civilian facilities under IAEA safeguards. In exchange, the United States would work toward civilian nuclear cooperation with India.¹⁰

To initiate nuclear cooperation, the U.S. Congress passed the Henry J. Hyde U.S.–India Nuclear Cooperation Promotion Act of 2006 (PL 109-401). The Hyde Act authorized the U.S. president to exempt the proposed United States–India nuclear cooperation agreement from U.S. Atomic Energy Act requirements for IAEA safeguards on all nuclear materials as well as to waive the mandatory termination of nuclear exports based on India's previous nuclear detonations. Furthermore, the Hyde Act includes language

nuclear equipment and supplies, because the CSC establishes a predictable international liability system and would provide liability coverage and limitations for these U.S. companies.

10. Michael Levi and Charles Ferguson, *U.S.-India Nuclear Cooperation: A Strategy for Moving Forward*, Council Special Report 16 (New York: Council on Foreign Relations, 2006).

stating that India is taking the necessary steps to secure sensitive materials and technology and that the NSG has decided to permit supply to India of specific nuclear items. This change in NSG attitude essentially left decisions regarding nuclear cooperation with India up to individual governments; consequently, India has since signed a number of nuclear cooperation agreements with various foreign suppliers, such as France and Russia.

The passage of the Hyde Act permitted the United States–India 123 Agreement to be pursued essentially as a nonexempt agreement, and the passage of the U.S.-India Nuclear Cooperation Approval and Nonproliferation Enhancement Act of 2008 (PL 110-369) approved the Agreement for United States–India nuclear cooperation. Recent additions to this Agreement occurred in 2010 when the United States and India signed an agreement under which India may reprocess U.S.-origin nuclear fuel in two as yet unconstructed national reprocessing facilities.

There are both positive and negative views of this shift in nuclear relations. India has the stated goal of a 13-fold increase in nuclear power by 2030, potentially representing a \$175 billion nuclear market. Gaining access to this market is clearly beneficial to U.S. nuclear equipment suppliers. The 123 Agreement may also have diplomatic and strategic benefits by fostering goodwill on the part of India toward the United States and tying the two countries closer together. A friendly partner in that region of the world may be increasingly important if tensions between the United States and Pakistan or the United States and China escalate. Moreover, from a nonproliferation perspective, this cooperation could bring India closer to the NPT regime. The agreement also does place some Indian facilities under IAEA safeguards, where before there were none.

Negative views of the passage of this 123 Agreement center on whether it represents an implicit approval and acceptance of both India's status as a nuclear weapon state and its desire to construct reprocessing facilities. In fact, significant concessions have already been granted for India's pursuit of reprocessing technology. Furthermore, although India signed the CSC, the country also passed its own liability legislation in August 2010, which may be inconsistent with the terms of the CSC.¹¹ This potential inconsistency has been a cause for trepidation on the part of U.S. nuclear equipment suppliers, in effect preventing the U.S. industry from entering the newly opened Indian nuclear market.

These are serious concerns, and the long-term effects of renewed nuclear cooperation between the United States and India, which has also ushered in cooperation between India and other countries, are unknown and may not be positive. Even with IAEA safeguards on some facilities, it may be impossible to prevent civilian nuclear cooperation from aiding India's weapons program, potentially putting all nuclear suppliers to India in violation of their NPT obligation not to assist in nuclear weapons programs.¹²

11. India's national liability law indicates that, after the state-owned Nuclear Power Corporation of India reaches its compensation cap, the Indian government is responsible for the remainder. However, after paying out the necessary compensation, the atomic power monopoly can seek remuneration from suppliers for equipment and material deemed defective.

12. Nonproliferation Program, Carnegie Endowment for International Peace, "Issues in U.S.-India Nuclear Cooperation," <http://www.carnegieendowment.org/files/123agreementchart.pdf>.

The United States–United Arab Emirates 123 Agreement

The United Arab Emirates currently has a 16 gigawatt national power grid, but with a predicted annual growth rate of 9 percent, will require a 40 gigawatt grid by 2020. Although oil and natural gas are logistically viable energy sources, such an increase in domestic energy demand would produce a high economic opportunity cost as a result of lost export revenue. Meanwhile, wind and solar power potential, even with aggressive development, can only meet 6 to 7 percent of peak electricity demand.¹³ Hence, although lacking domestic uranium reserves, the Emirates has decided to pursue the development of nuclear energy.

To proceed toward this goal, the United Arab Emirates entered into a 123 Agreement with the United States in December 2009. The United States–Emirates 123 is unique because the agreement contains a commitment on the part of the Emirates not to pursue domestic reprocessing or enrichment of any origin nuclear material. For fuel, the Emirates plans to rely on international nuclear fuel market sources.

Given the serious intent of the Emirates to develop domestic nuclear energy, the 123 provides the opportunity for U.S. industry to expand its market share. The United States–Emirates 123 also represents an important step in nonproliferation efforts, both because the Emirates brought the Additional Protocol of the NPT into force in December 2010 and because the Emirates will forgo enrichment and reprocessing. This latter point is particularly important in improving the global nonproliferation regime by preventing the spread of sensitive and dual-purpose technology that could be attractive to states seeking nuclear weapons.

Whether the agreement will accomplish these objectives is still unknown. In January 2010, the United Arab Emirates announced that Kepco (a South Korean rather than U.S. firm) had been awarded a contract to build four reactors by 2020. Adding further uncertainty to the long-term results, there is also a most-favored-nation treatment clause in the Emirates' 123 that allows it to renegotiate the terms if any country in the region negotiates a less stringent 123 Agreement.

Potential Future Agreements

A United States–Jordan 123 Agreement

Jordanian energy imports consume 19 percent of national GDP, and imported oil represents 66 percent of Jordanian power dependence.¹⁴ To address chronic energy shortages, Jordan aims to generate 20 to 30 percent of domestic electricity through nuclear power, developing this sector from 2017 to 2030.¹⁵ Accordingly, in September 2007, the United

13. Christopher M. Blanchard and Paul K. Kerr, *The United Arab Emirates Nuclear Program and Proposed U.S. Nuclear Cooperation* (Washington, D.C.: Congressional Research Service, 2009), <http://www.hsdl.org/?view&doc=113801&coll=limited>.

14. For comparison, the United States spends 9 percent of its GDP on energy.

15. Jeremy M. Sharp, *Jordan: Background and U.S. Relations* (Washington, D.C.:

States and Jordan produced a memorandum of understanding outlining potential cooperation on developing the requirements for power reactors, fuel service arrangements, civilian training, and nuclear safety and energy technology. Such a memorandum is one potential first step in the process toward concluding a 123.

Jordan may represent a promising market for the U.S. nuclear industry and an important diplomatic tie due its geographic location between Israel, Syria, Iraq, and Saudi Arabia; Jordan has the potential to serve as a buffer between potential adversaries in the Middle East. In addition, Jordan signed the NPT in 1968 and ratified the Additional Protocol in 1998, positive factors when considering a country's eligibility for a 123 Agreement.

However, there are serious reservations to pursuing a United States–Jordan 123. Questions surround the role of Jordan in the Arab-Israeli peace process, and there are concerns about the potential vulnerability of Jordan (and of any nuclear material or equipment in Jordan) to the strategic designs of powerful neighbors, and also the stability of the Jordanian governmental regime itself.

Moreover, in a kingdom with few natural resources, Jordan does have a significant quantity (potentially more than 65,000 tons) of mineable uranium and has reportedly agreed to mine but not enrich the Uranium. However, Jordan will not explicitly renounce its “right” to enrich.¹⁶ This lack of explicit renunciation, and its related manifestation in a future 123 Agreement, presents the risk of spreading sensitive enrichment technologies, and opens the possibility for the United Arab Emirates to renegotiate the terms of its agreement. Together, these points demonstrate the potentially serious ramification of a United States–Jordan 123. It will be interesting to observe how the United States chooses to proceed.

A United States–Vietnam 123 Agreement

Vietnamese energy demands increased by 15 percent from 2000 to 2010, with further growth anticipated.¹⁷ Consequently, the Vietnamese government is investigating a variety of means to meet growing demand, including nuclear power. In fact, Russia and Vietnam have signed a \$5.6 billion deal to build two Russian reactors, which will have fresh fuel and spent fuel both supplied and removed by Russia.¹⁸ U.S. involvement and cooperation with the development of the Vietnamese nuclear program has the potential

Congressional Research Service, 2011), <http://www.fas.org/sgp/crs/mideast/RL33546.pdf>.

16. Open Source Center, “Jordan Atomic Energy Official Cited on Nuclear Program; Fear of US ‘Terms’ Noted,” *Al Jazirah.net*, April 1, 2010, GMP20100402676001.

17. “Vietnam: Energy Report,” Economist Intelligence Unit, December 16, 2009, http://www.eiu.com/index.asp?layout=ib3Article&article_id=75091792&pubtypeid=1142462499&category_id=775133077&country_id=1010000301&page_title=Forecast.

18. Fred McGoldrick, “The U.S.-UAE Peaceful Nuclear Cooperation Agreement: A Gold Standard or Fool’s Gold?” Proliferation Prevention Program Policy Perspectives, Center for Strategic and International Studies, November 30, 2010, http://csis.org/files/publication/101130_McGoldrick_USUAENuclear.pdf.

to open a new market for U.S. nuclear technology and guide the program to meet global nonproliferation goals.

To date, the United States has played a supportive role in the development of a Vietnamese nuclear energy program. In 2008, the United States assisted with the drafting of the Vietnamese Atomic Energy legislation, and in March 2010, a memorandum of understanding was written concerning cooperation between the United States and Vietnam in the civilian nuclear field.¹⁹ The U.S. Department of State has provided assistance to strengthen Vietnamese export controls, a key prerequisite for establishing a nuclear program, and the U.S. Department of Energy and Nuclear Regulatory Commission have undertaken the training of Vietnamese officials on nonproliferation issues and nuclear safety best practices. Furthermore, with the Department of Energy's assistance, Vietnam is converting its highly enriched uranium research reactor in Dalat, originally supplied by the Soviet Union, to a low-enriched uranium reactor, and returning the highly enriched uranium to Russia.

Although Vietnam does not currently have plans to develop enrichment technology, the proposed terms of the United States–Vietnam 123 Agreement do not explicitly prohibit it.²⁰ This ambiguity does not assuage proliferation concerns and may fuel accusations that the United States is creating a regional double standard. Jordan's refusal to renounce enrichment and reprocessing remains a serious stumbling block to the completion of its 123, but the United States has not indicated analogous concerns in its negotiations with Vietnam. At this point, the terms and resulting effects of a United States–Vietnam 123 remain to be seen.

Considerations and Recommendations for the Next Generation of 123 Agreements

Although the framework for 123 Agreements has not changed since 1954 and the associated nonproliferation requirements have not changed since 1978, the world has continued to evolve. Throughout the Cold War era, the United States was the global powerhouse in nuclear energy; few other countries had the capacity or the desire to be exporters of nuclear technology. This situation has now changed. A number of countries, such as France and South Korea, export their nuclear technology and components, while proliferation concerns have only continued to grow. The change in world conditions begs the question of the present suitability of the requirements and conditions of 123 Agreements. For example, with modern technology's ever-expanding lines of communication, are additional safeguards necessary on the transfer of and access to peaceful nuclear *knowledge*?

Another increasingly relevant consideration concerns the resulting state of affairs if a country's government collapses or undergoes a major transition. Is the previously

19. U.S. Embassy Hanoi, "Ambassador's Speech Remarks at the Signing Ceremony for Nuclear Cooperation MOU," March 30, 2010.

20. Jay Solomon, "U.S., Hanoi in Nuclear Talks," *Wall Street Journal*, August 3, 2010.

concluded 123 binding even after a regime change? And are safeguards on already transferred equipment and material still guaranteed?

A historical example of this situation is provided by the 123 Agreement with Taiwan. In 1979, when the United States effectively withdrew diplomatic relations from Taiwan with the inception of its relations with mainland China, there was an extant agreement in place. At the time of derecognition, the administration of all previously concluded agreements was transferred to the American Institute in Taiwan, a nonprofit, nongovernmental organization.²¹ This change in administrative authority has, apparently, not been the cause of proliferation issues. However, in future cases, this is not the guaranteed, or perhaps even the expected, outcome, particularly if the government transition is the result of an internal coup. The next generation of 123 Agreements may need to address such a scenario and provide the means for enforcing the requirements and termination of an already-concluded agreement.

Additional considerations for future 123 Agreements focus on uranium enrichment and reprocessing, regional variations, safeguards, congressional approval, and liability regimes. To address these considerations in today's changed economic, diplomatic, and nonproliferation environment not only the terms, but also the framework, of 123 Agreements may need to be altered.

As explained above, presently there are two types of 123 Agreements—*exempt* and *nonexempt*. A possible alternative in the next generation of agreements is to replace this duality with a multitiered system. Such a system could incorporate different requirements, benefits, and approval mechanisms based on the tier for which a country qualifies. The appropriate tier would be determined by behavior, history, and perceived and stated goals. Although more complicated, a multitiered system could increase the relevance and efficacy of future 123 Agreements by fine-tuning each agreement to be better suited to the particular challenges and concerns associated with the country in question. The following subsections elucidate 123 concerns and how they could be addressed through a multitiered approach.

The Ability to Enrich and Reprocess

Significant emphasis has been placed on the United Arab Emirates' decision to explicitly forgo domestic enrichment and reprocessing of nuclear material of any origin. Given the proliferation concerns associated with enrichment and reprocessing technology and the desire to avoid the spread of such dual-purpose technology, this decision could usher in a new baseline for future 123 Agreements. However, other countries argue that the NPT provides a sovereign right to enrich and reprocess. Therefore, even if the United States includes this more stringent criterion in future 123s, other countries may not.

21. "Background Note: Taiwan," Bureau of East Asian and Pacific Affairs, U.S. Department of State. All diplomatic relations with Taiwan are conducted pursuant to the Taiwan Relations Act (PL 96-8) and Executive Order 12143 and specifically do not constitute U.S. recognition of the Taiwan authorities or a continuation of an official governmental relationship with Taiwan.

Without a global consensus, it is difficult to determine what benefits, aside from ideological ones, the United States would reap from including a broad prohibition on enrichment and reprocessing in the official 123 Agreement legislating language. A lack of parallel requirements stipulated by countries exporting nuclear technology could place the United States at a disadvantage when negotiating nuclear cooperation agreements, while still failing to discourage the spread of enrichment and reprocessing technology. Such a result would clearly be counterproductive to the original motivation for a 123—to encourage a safe and secure framework for civilian nuclear cooperation between the United States and another country.

A tiered approach to 123s could assist with this dilemma. In a tiered system, countries could be grouped according to their expressed desire (or lack thereof) to enrich and reprocess. Different tiers could provide different technological benefits, safeguards requirements, and approval mechanisms. The goal of the tiered system would be to incentivize a country to renounce enrichment and reprocessing in order to be grouped into a more advantageous tier. Furthermore, in the absence of a complete renunciation, certain tiers could impose the requirement that a country provide a concrete fuel cycle plan in advance of concluding the 123. Requiring a country to develop such a plan in advance of bilateral cooperation would introduce an additional onus on members of that tier as well as have the side benefit of encouraging foresight on the difficult and unsavory topic of spent fuel disposal. Such a requirement would also impart added confidence in a country's earnest intent to develop civilian nuclear facilities and provide a degree of nonproliferation assurance even without renunciation.

Regional Requirements

Currently, the U.S. Atomic Energy Act does not levy different requirements on different regions of the world. However, the debates with respect to the differing terms of the 123 Agreements for the United Arab Emirates, Jordan, and Vietnam that were sketched above suggests that future agreements might have regional requirements, in place of a global standard. This route is especially tempting to pursue given the differences in relative stability and diplomatic relations in various regions of the world.

It is important to note, however, that the United States has experienced changing diplomatic ties throughout history—friends shift to foes, and vice versa. Establishing an official regional standard in legislating language may therefore place an expiration date on the language, requiring a return to the complicated the Atomic Energy Act amendment debate when diplomatic winds shift.

The merits of an official versus de facto regional standard can be further debated, but as 123 Agreements are concluded on an individual basis, each country's geographic location, diplomatic ties, and aspirations are taken into account. Using a tiered approach, countries could be grouped based on their diplomatic ties to the United States, U.S. allies, and nonallies, along with their relationships with bordering countries. The terms and approval process of the 123 would then reflect considerations of these factors taken together as a whole rather than a simple geographic determination. For any tier, however, the stability of the agreement may potentially benefit from avoiding the inclusion

of most-favored-nation treatment clauses that permit a country to renegotiate if a less stringent agreement is concluded with a regional partner.

IAEA Safeguards Requirements

Strict safeguards on all nuclear material are a necessity and are already required by the terms of the 123 Agreements. However, future 123s may benefit from a requirement that a state sign on to the Additional Protocol of the NPT before the United States will engage in nuclear cooperation. The Additional Protocol grants the IAEA supplementary inspection rights—as compared with standard safeguards agreements—including increased access to information and sites. By adhering to the terms of the protocol, a state provides assurance that material and equipment is not being diverted from declared sources for possible undeclared activities. As of December 2010, 139 countries have signed the protocol; 104 have brought the protocol into force.

Some states claim that the terms of the Additional Protocol are too invasive and interfere with legitimate, nonnuclear, state defense activities and secrets, while others argue that requiring the protocol begins the nuclear cooperation relationship on terms of mutual suspicion rather than mutual trust. Still other states refuse to implement the protocol until their regional neighbors have done so.²²

Although these are genuine concerns, there has been a trend toward increased safeguards required for nuclear cooperation, and requiring the Additional Protocol as part of the terms of the 123 would fit this trend. The protocol provides an enhanced nonproliferation regime, and the large number of states that have already signed on, demonstrates that the terms of the protocol are not too invasive. A tiered approach could be applied by distinguishing between countries that have signed the protocol, countries that have implemented the protocol, and countries that have neither signed nor implemented the protocol. Depending upon into which category a country falls, the requirements of the 123 would differ, perhaps requiring additional, explicit nonproliferation assurances for nations without the protocol.

The Congressional Approval/Disapproval Process

Another subject of concern is the requisite approval process for 123 Agreements. Presently, as long as an agreement can be categorized as nonexempt (and all 123 Agreements to date have been so), active congressional approval is not required. This process relies on the determination by the president and the Department of State that the agreement is in the best interests of the United States. With such a determination in hand, there may not be remaining issues that Congress needs to debate. Furthermore, given the consistently busy congressional calendar, passive approval in this manner could be a convenient and efficient way to pass legislation.

A number of members of Congress, however, would disagree with these assertions. The two bills that have been most recently introduced to amend the U.S. Atomic Energy

22. This example applies to Egypt, which has declined to sign on to the Additional Protocol until Israel accepts comprehensive safeguards.

Act would have required active congressional approval. Two examples explicate why there is this level of interest on the part of Congress in the approval process.

In December 2010, the 111th Congress was understandably focused on the passage of New START. However, concurrently the countdown was proceeding on the 90-day period required for the United States–Russia 123 Agreement to become law. Because of the calendar uncertainty at the conclusion of the 111th congressional session, until the 90 days had actually passed, it was unclear whether there would be the necessary days of continuous session or if the agreement would need to be resubmitted yet again in the new Congress in January 2011. Given the history of the relationship between the United States and Russia (and erstwhile Soviet Union), an agreement for nuclear cooperation represents a potentially significant change, which may have warranted congressional attention in place of passive and nearly unnoticed approval.

During this same period, the noncontroversial renewal of the United States–Australia 123 Agreement was also pending. Although transfer of raw material, such as mined uranium, does not require a 123, Australia indicated that its shipments of uranium to the United States would be halted if the 123 was not approved. These shipments are critical to the U.S. nuclear fuel cycle, but without the requirement to pass a resolution of approval, the agreement and the uranium shipments were left in limbo until the 90 days of continuous session concluded due to unscheduled extra days of session at the conclusion of the 111th Congress.

To require active congressional approval would provide the opportunity for Congress to discuss the merits and terms of a proposed 123 Agreement, potentially improving an agreement, as well as elucidating the agreement's purpose and motivation. The requirement for active congressional approval could also potentially streamline the approval process for noncontroversial agreements. Conversely, an active approval requirement could potentially inundate an agreement with nongermane issues.

The additional complexity introduced by a tiered system could address these issues. Agreement renewals could be part of a tier that permits the 123 to be fast-tracked and thus avoid the requirement for 90 days of continuous session, while controversial agreements would be in a separate tier and would require both executive and active congressional approval. In this manner, the mechanism for approval would be predetermined based upon the party to the agreement and legislating language, rather than being left to the whims of the congressional calendar. Careful consideration of the categorization of the agreement would be needed and could take into account how the country has been grouped on related 123 issues.

The Domestic Liability Regime

In addition to proliferation concerns, there are economic considerations for the next generation of 123 Agreements. As countries pursue domestic nuclear energy programs, the U.S. nuclear manufacturing industry will seek to expand its market share in these developing markets. However, the question arises: Who will be indemnified in the event of a nuclear accident, and who will be responsible for the bulk of compensation and

clean-up efforts? Without a global liability regime such as the CSC, the nuclear industry is dependent on each country's individual liability regime, or the lack thereof. U.S. manufacturers are independent entities, but companies in other countries like France and Russia enjoy a degree of sovereign immunity by being partially state owned. This disparity results in varying levels of concern for the existence and role of domestic liability regimes in the event of a nuclear accident.

U.S. nuclear equipment manufacturers have indicated their need for a degree of assurance that a state will not bring suit against them because of operator error. To ensure that the U.S. nuclear industry maintains the ability to enter new markets, future 123 Agreements should require a state to either be a party to the CSC or to have a domestic liability law and regime of suitable terms and enforcement level. Such a baseline standard would demonstrate the serious intent of a country to grow a sustainable, modern domestic nuclear industry. The tiered approach could apply a favorable technology transfer framework to countries that adhere to this baseline standard, thus incentivizing compliance.

Although challenging and fraught with opponents, it is worthwhile to consider amendments to the legislating language of 123 Agreements. Global politics, safety concerns, energy concerns, and technology have changed dramatically since 1954 and 1978. As additional countries seek the prestige and energy opportunities of nuclear power, the United States should be on the forefront in guiding those nations' programs to meet nuclear nonproliferation goals and to enhance U.S. economic prospects. Accordingly, the agreements guiding bilateral civilian nuclear cooperation may need adjustment to reflect fully each of these factors, and a tiered approach is one possible option for updating and improving the next generation of 123 Agreements. This system would indeed add complexity, but would also add flexibility and potential effectiveness.

The Threat That Leaves Something to Chance in United States–China Relations

Vincent Manzo

Thomas Schelling’s “threat that leaves something to chance” illuminated how a state might achieve its foreign policy objectives by manipulating shared risks in dangerous circumstances. Because confrontations between nuclear weapon states would be unpredictable and difficult to control, Schelling argued, leaders in both countries could perceive an incentive to threaten an outcome—full-scale nuclear war—that they would be unlikely to choose in order to gain strategic advantages from having demonstrated a mere willingness to risk disaster. Though influenced by the U.S.-Soviet competition, Schelling’s strategic concept applies to contemporary U.S.-China relations. Both countries’ diverse strategic postures create a multitude of strike options, vulnerabilities, and opportunities for miscalculation and misinterpretation that would increase the potential for unwanted escalation in crises. In particular, concerns about non-nuclear first-strike vulnerability, ambiguous thresholds in space and cyberspace, and blurring of nuclear and conventional thresholds would make it more difficult for U.S. and Chinese officials to control escalation. Schelling’s lesson for U.S. policymakers, therefore, is that they should cultivate China’s appreciation of the potential for uncontrollable and unintended consequences in military confrontations with the United States. A strategy to do this would include both competitive and cooperative measures.

Introduction

How could the United States credibly threaten to use nuclear weapons on behalf of its allies if doing so would risk a Soviet nuclear attack on the U.S. homeland? U.S. strategists struggled with this question throughout the Cold War. The “threat that leaves something to chance” is Thomas Schelling’s attempted answer. Keith Payne describes Schelling as the “single most influential strategic theorist of the Cold War,”¹ while Colin Gray argues that Schelling is one of ten authors in history that has truly contrib-

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1. 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), 31.

uted to the general theory of strategy.² Such praise raises the question: is Schelling's analysis of threats, shared risks, deterrence, and coercion applicable today? If so, does his work offer lessons for policymakers? This paper considers how Schelling's insights apply to contemporary United States–China relations. The first section briefly summarizes Schelling's strategic concept and explains how it developed from his analysis of the U.S.-Soviet security competition. The second section explores the shared risks of escalation in a United States–China military confrontation, and the concluding section discusses the implications for U.S. strategy toward China.

Schelling's Threat That Leaves Something to Chance

Schelling's Assessment of U.S.-Soviet Military Confrontations

Schelling conceptualized U.S.-Soviet military confrontations as a game of mixed motives. The United States and Soviet Union possessed a shared interest in avoiding a full-scale nuclear war that would destroy both countries. Due to the high stakes of their ideological struggle, however, these two nations would inevitably have competing interests in conflicts.³ Yet Schelling also envisioned U.S.-Soviet military confrontations as unpredictable interactions that leaders in both countries could influence, but neither could completely control: “The essence of the crisis is its unpredictability.”⁴

The interplay between mixed incentives and unpredictability drives escalation in Schelling's analysis. Decisions in crises would rarely be as stark as one to fight a full-scale nuclear war or to surrender. Instead, Schelling argued that leaders in both countries would likely take actions that increase the risks of nuclear war rather than concede. But it would be difficult for policymakers to determine the consequences of specific actions in advance. Leaders in both countries would be uncertain of each other's intentions and capabilities, and they might misjudge how their own actions would be perceived by leaders in the opposing government. Those making important strategic decisions would be dependent upon imperfect decisionmaking processes and operating procedures that might be ill suited to the unfolding crisis. They would be unable to constantly and completely control all their deployed forces.

Because these leaders would not know, nor completely control, the situations that they would confront as the conflict unfolds, they would be unable to predict what decisions they would reach in the future. Actions that appeared highly risky days or even hours earlier could prove to be the least bad option in a horrible situation. The speed and range of ballistic missiles, the destructiveness of nuclear warheads, and the fallibility of early warning systems would exacerbate these uncertainties because leaders in

2. Colin S. Gray, “The Strategist as Hero,” *Joint Forces Quarterly* 62 (2011): 39.

3. Thomas Schelling, *Strategy of Conflict* (Cambridge, Mass.: Harvard University Press, 1960), 6.

4. Thomas Schelling, *Arms and Influence* (New Haven, Conn.: Yale University Press, 1966), 97.

one country might correctly or incorrectly conclude that war is inevitable and perceive an advantage in launching a nuclear first strike to disarm the enemy before the enemy disarms them.⁵

Leaders in both countries might desperately want to avoid a full-scale nuclear war, but “a compounding of actions and reactions, of calculations and miscalculations, of alarms and false alarms, of commitments and challenges” could lead either side to perceive the use of nuclear weapons as necessary.⁶ Alternatively, the use of nuclear weapons might occur “through some kind of accident, false alarm, or mechanical failure.”⁷ Schelling’s reoccurring point was that a situation could escalate beyond control due to developments that neither country intended.

Manipulating a Shared Risk of Nuclear War

To Schelling, unpredictability and incomplete control over events were shared risks that leaders in either country could manipulate to deter and coerce the other. Though it would be a disaster for both countries, U.S. leaders might be able to leverage the risk of full-scale nuclear war because the “final decision is not altogether under the threatener’s control.”⁸ For instance, the United States might influence Soviet actions by threatening to create a high-risk situation that Soviet leaders perceive as intolerable, thereby making concessions the preferable alternative. Such a threat would be “credible precisely because its consequences are not entirely within” the control of U.S. leaders.⁹ Schelling’s assessment of nuclear confrontations as unpredictable and beyond control thus enabled U.S. leaders to threaten an outcome—full-scale nuclear war—that that they would be unlikely to deliberately choose. The utility of this threat that leaves something to chance was that the United States and Soviet Union could influence one another’s behavior “not by a definite threat to do something to [the other] but because the wrong step could provoke a situation in which terrible things happen to [the other].”¹⁰

From this perspective, U.S. deterrence did not require Soviet leaders to believe that the United States would *definitely* use nuclear weapons to defend its allies; they needed only to believe that the United States would respond in a way that could trigger a cycle of escalation that would be beyond either country’s control. Schelling described U.S. forward-deployed forces in Europe in this light: “What we threaten in Berlin is to initiate a process that may get quickly out of hand.”¹¹ Schelling believed that nuclear threats could deter Soviet attacks on U.S. allies if Soviet leaders perceived U.S. involvement

5. For Schelling’s description of these uncertainties, see Schelling, *Strategy of Conflict*, 187–204; and Schelling, *Arms and Influence*, 92–125.

6. Schelling, *Arms and Influence*, 97.

7. Schelling, *Strategy of Conflict*, 188.

8. *Ibid.*, 188.

9. Schelling, *Arms and Influence*, 109.

10. Lawrence Freedman, *The Evolution of Nuclear Strategy*, 3rd ed. (New York: Palgrave Macmillan, 2003), 211.

11. Schelling, *Arms and Influence*, 49.

in a limited conflict in Europe as likely, and if they also perceived an intolerable risk of larger war as a likely consequence of this involvement.¹²

Although forward-deployed U.S. forces might cultivate such a threat that leaves something to chance, Schelling argued that employing force to convey the increasing danger of a conflict to opposing leaders might be necessary in some circumstances. For instance, he explained that in certain circumstances Soviet leaders might have perceived backing down as preferable to the risks of prolonged conflict only after they encounter U.S. military resistance to local aggression. He described this phenomenon as “dynamic deterrence” through “progressive fulfillment.”¹³

Schelling, however, did not limit his analysis to resistance. He considered how U.S. and Soviet leaders might terminate a conflict through deliberate escalation. A recent RAND study described this as “suggestive escalation” because its purpose is to provide an adversary with a taste of the punishment that might result from continued conflict.¹⁴ In particular, Schelling explored the potential for coercion through limited nuclear strikes. Such an attack would be dangerous, but that is why it would be effective. If the shared risk of mutual destruction was not credible or did not resonate with Soviet leaders at the outset of a conflict, Schelling reasoned, discrete nuclear strikes might make them reconsider their choices, coercing them to pull back troops from Western Europe or agree to a cease-fire.¹⁵

Schelling proposed bargaining through escalation as a way to employ nuclear weapons to achieve a desirable outcome before a conflict denigrated into a full-scale nuclear war. U.S. and Soviet leaders could communicate through nuclear strikes, calibrating the magnitude and targets of a strike to the message they wanted it to convey. For Schelling, the objective would be to convince the Soviets that the war would be too dangerous and that their best option would be to negotiate a cease-fire. Any actions that do not serve this purpose would distort the message.¹⁶

Is the Threat That Leaves Something to Chance Relevant Today?

Numerous strategic analysts have illuminated the challenges that U.S. and Soviet leaders would have encountered if they attempted to fight a limited nuclear war. Clear communication and restraint in a war of nuclear bargaining would require common understandings among adversaries. Assuming that these norms are shared before a conflict, leaders might cast them aside in response to the stress, destruction, loss of life, and chaos that

12. See Schelling, *Strategy of Conflict*, 190–193; Schelling, *Arms and Influence*, 105–109; Freedman, *Evolution*, 277.

13. Schelling, *Arms and Influence*, 78–79.

14. Forrest E. Morgan, Karl P. Mueller, Evan S. Medeiros, Kevil L. Pollpeter, and Roger Cliff, *Dangerous Thresholds: Managing Escalation in the 21st Century* (Arlington, Va.: RAND, 2008), 31–33.

15. For the “rocking the boat” metaphor and others that Schelling used to illuminate this logic, see Schelling, *Strategy of Conflict*, 195–199.

16. For this discussion, see Schelling, *Arms and Influence*, 109–116.

would occur during nuclear war.¹⁷ Nuclear command and control in one or both countries might break down during a prolonged nuclear conflict, straining each nation's ability to limit and calibrate nuclear strikes, communicate with each other, and relay launch and cease-fire orders to deployed forces.¹⁸ Differing perceptions of the salient thresholds in a conflict might cause leaders in both countries to misinterpret each other's actions and miscalculate each other's reactions.

A 2008 RAND study defined escalation as “an increase in the intensity or scope of conflict that crosses thresholds considered significant by one or more of the participants.” Unfortunately, thresholds are subjective. Two states might observe the same action, such as attacks against targets deep inside a country's territory, but interpret its significance differently. One state might cross an adversary's threshold without realizing it. Leaders might not know a threshold exists until it is crossed, or they might not know how they would respond to a provocation until it occurs. Such discrepancies in perceptions might drive escalation despite both countries' desire to limit the conflict.¹⁹

These insights demonstrate that Schelling's conceptual analysis of nuclear bargaining and coercion would be difficult to translate into practice. However, the challenges they raise substantiate the basis of his threat that leaves something to chance: A confrontation between two nuclear weapon states would be unpredictable and difficult to control. To be fair to Schelling, he did not advocate deliberately provoking crises with the Soviet Union. Rather, he analyzed how both countries might try to exploit shared risks of escalation to achieve strategic objectives and avoid mutual destruction at a time when many experts believed a U.S.-Soviet war was inevitable.

For contemporary policymakers, Schelling's books, *The Strategy of Conflict* and *Arms and Influence*, are best read as thought-provoking discussions of how a nation might achieve its foreign policy objectives by manipulating shared risks in dangerous circumstances. An interesting question is whether and how Schelling's threat that leaves something to chance might apply to contemporary bilateral relationships—in particular, the United States–China dyad. The concept would only apply if both countries face a shared risk of unintended escalation. Both must want to prevent a conflict from getting out of hand; otherwise, only one would have incentives to limit escalation. Similarly, there must be a potential for unwanted escalation despite both countries' limitation efforts, as threats to create a heightened risk of catastrophe would lack credibility because at least one country would end the conflict before it became too costly. Exploring whether such conditions would exist in United States–China military crises, therefore, is a necessary starting point for this analysis.

17. Freedman, *Evolution*, 202.

18. See Bruce Blair, *Strategic Command and Control: Redefining the Nuclear Threat* (Washington, D.C.: Brookings Institution Press, 1985); and Paul Bracken, “War Termination,” in *Managing Nuclear Operations*, edited by Ashton Carter, John Steinbruner, and Charles Zraket (Washington, D.C.: Brookings Institution Press, 1987).

19. Morgan et al., *Dangerous Thresholds*, 7–14; Richard Ned Lebow, *Nuclear Crisis Management: A Dangerous Illusion* (Ithaca, N.Y.: Cornell University Press, 1987), 104–153.

Shared Risks in United States–China Relations

Defining Differences between United States–China vs. U.S.-Soviet Shared Risks

Contemporary United States–China relations are not comparable to the U.S.-Soviet security competition that influenced Schelling’s analysis. Unlike the ideological struggle of the Cold War, United States–China relations encompass a diverse mix of overlapping and competing economic and security interests. Rather than containment, U.S. policy toward China seeks to mitigate areas of competition and improve bilateral cooperation where each side’s interests coincide.²⁰ If mutual destruction made U.S.-Soviet relations a mixed-motive game, economic interdependence and some common security interests create strong incentives for U.S. and Chinese officials to avoid disruptive military confrontations.

Moreover, the conditions that Schelling and others argued would create nuclear first-strike instability between the United States and the Soviet Union are not present in the United States–China strategic balance. China is developing a secure and credible capability to absorb a nuclear strike and retaliate with mobile long-range ballistic missiles, yet its inventory of approximately 40 long-range missiles would not enable a disarming or even damage-limiting first-strike against the significantly larger arsenal of U.S. nuclear forces.²¹ As a result, neither the United States nor China would have a strong incentive to attempt a disarming nuclear first strike against the other in crises. Even if Chinese leaders were concerned about the survivability of their nuclear forces, a nuclear first strike would be an unattractive option because it would invite retaliation without significantly reducing the size of the U.S. nuclear arsenal. Similarly, U.S. leaders would not perceive their own nuclear forces as vulnerable to a nuclear first strike from China. Nor would they be likely to consider a nuclear first strike as a viable option because China would probably be capable of retaliating with at least a handful of nuclear-armed missiles that survive the attack and are capable of penetrating U.S. missile defenses that are designed for less-sophisticated missiles from rogue states. The potential imbalance between the risks of waiting and the benefits of striking first with nuclear weapons that worried many analysts during the Cold War does not exist.²²

20. Phillip C. Saunders, *Managing Strategic Competition with China*, Institute for National Strategic Studies Strategic Forum 242 (Washington, D.C.: National Defense University Press, 2009).

21. For descriptions of China’s current and near-term nuclear forces and policy, see Office of the Secretary of Defense, *Annual Report to Congress, Military and Security Developments Involving the People’s Republic of China 2010* (Washington, D.C.: U.S. Department of Defense, 2010), 34–35; and M. Taylor Fravel and Evan S. Medeiros, “China’s Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure,” *International Security*, 35, no. 2 (2010): 48–87. Under New START, the United States will deploy 1,550 strategic warheads across 700 strategic delivery vehicles.

22. Michael Chase, Andrew Erickson, and Christopher Yeaw, “Chinese Theater and Strategic Missile Force Modernization and Its Implications for the United States,” *Journal of*

Potential Interactions between U.S. and Chinese Strategic Postures

There are, however, shared risks of escalation in United States–China relations. Recent U.S. policy and strategy reviews call for a more stable military relationship with China, but they also state that China’s reluctance to explain the purpose and scope of its emerging strategic posture raises concerns about its long-term intentions.²³ The status of Taiwan, territorial disputes in the South China Sea, and a potential crisis on the Korean Peninsula are potential flashpoints for military confrontation. Additionally, China frequently shadows U.S. reconnaissance patrols in and around China’s Exclusive Economic Zone.²⁴ A military confrontation over any of these disagreements is unlikely but possible. Though both countries would try to limit the use of force in any such scenario, interactions between the evolving U.S. and Chinese strategic postures might trigger inadvertent and miscalculated escalation. In particular, each country’s concern about the other’s nonnuclear strategic forces might create, for lack of a better term, nonnuclear first-strike instability.

Chinese officials are concerned that the United States will eventually increase the number of interceptors in the Ground-Based Midcourse Defense (GMD), the U.S. missile defense system that would protect the continental United States against limited long-range ballistic missile attacks, along with future improvement in U.S. missile defense technology more generally; potential U.S. nonnuclear long-range strike systems, particularly conventionally-armed long-range missiles envisioned under the Conventional Prompt Global Strike (CPGS) concept; and improving command, control, communication, computer (C4) and intelligence, surveillance, and reconnaissance (ISR) capabilities. Chinese strategists fear that the combination of these forces might someday enable the United States to locate and destroy many of China’s nuclear forces with nonnuclear strikes and intercept the remaining ones with missile defense interceptors. A related Chinese concern is that U.S. officials might believe that the United States has a nonnuclear first strike capability and conclude that the United States has achieved “absolute” secu-

Strategic Studies 32, no. 1 (2009): 99. Of course, according to China’s No First Use Doctrine, it would never launch a nuclear first-strike regardless of the circumstances. Experts disagree on whether this No First Use Doctrine would constrain Chinese behavior in crises; however, the point of emphasis here is that China’s nuclear arsenal is too small to create a first-strike incentive according to the classic definition of nuclear first-strike instability.

23. See U.S. Department of Defense, *Nuclear Posture Review Report* (Washington, D.C.: U.S. Department of Defense, 2010), 28–29; and U.S. Department of Defense, *Quadrennial Defense Review Report* (Washington, D.C.: U.S. Department of Defense, 2010), 31.

24. Some scholars interpret this trend as a small-scale threat that leaves something to chance because Chinese operators are deliberately increasing the chances of collisions with U.S. forces, perhaps due to the belief that the heightened risk will compel the United States to change its reconnaissance patterns. The author would like to thank Phillip Saunders for this insight. See also Oriana Skylar Mastro, “Signaling and Military Provocation in Chinese National Security Strategy: A Closer Look at the Impeccable Incident,” *Journal of Strategic Studies* 34, no. 2 (2011): 219–244; and Michael McDevitt, “Prepared Statement before the U.S.-China Economic and Security Review Commission,” June 11, 2009.

urity. Many Chinese analysts argue that the United States, feeling invulnerable to Chinese nuclear attack, would be tempted ignore China's core interests and attempt coercion.²⁵

Consistent with the goal of building a more stable military relationship with China, the United States is attempting to persuade Chinese officials that U.S. nonnuclear strategic forces will not undermine China's second strike capability. The *Ballistic Missile Defense Review Report* stated that the GMD system "does not have the capacity to cope with large scale Russian or Chinese missile attacks, and it is not intended to affect the strategic balance with those countries."²⁶ Similarly, the United States has emphasized that any U.S. conventional long-range missiles developed under the CPGS program would be a niche capability.²⁷ The *Nuclear Posture Review Report* stated that the United States would size its CPGS force to avoid "negatively affecting our nuclear relationships with Russia and China."²⁸ Two recent studies of China's reaction to the 2010 *Nuclear Posture Review Report*, however, concluded that Chinese concerns about missile defense and nonnuclear long-range strike persist despite U.S. assurances.²⁹

U.S. officials and analysts also express concern about China's emerging nonnuclear strategic forces. China is developing conventional ballistic and cruise missiles (including a potential antiship ballistic missile to target U.S. aircraft carriers), counterspace attacks and offensive cyberattack capabilities, air defenses, conventional aviation and naval strike forces, and sophisticated C4 and ISR capabilities (e.g., over-the-horizon radar). Many analysts argue that these forces will support an Anti-Access / Area Denial (A2/AD) strategy. According to this interpretation, in a war, China would use these non-nuclear capabilities to blunt the operations of U.S. forces in the Western Pacific and prevent additional U.S. forces from entering the region. These analyses emphasize that developing the capability to launch a "blinding attack" on U.S. C4 and ISR capabilities

25. Fravel and Medeiros, "China's Search," 83; Linton Brooks, "The Sino-American Nuclear Balance: Its Future and Implications," in *China's Arrival: A Strategic Framework for a Global Relationship*, edited by Abraham Denmark and Nirav Patel (Washington, D.C.: Center for a New American Security, 2009), 67; Brad Roberts, *Asia's Major Powers and the Emerging Challenges to Nuclear Stability Among Them*, IDA Paper P-4423 (Alexandria, Va.: Institute for Defense Analysis, 2009), 9; Evan Medeiros, "Minding the Gap: Assessing the Trajectory of the PLA's Strategic Missile Forces," in *Right Sizing the People's Liberation Army*, edited by Roy Kamphausen and Andrew Schobell (Carlisle, Pa.: Strategic Studies Institute, U.S. Army War College, 2007), 155–157; Phillip C. Saunders and Jing-dong Yuan, "Strategic Force Modernization," in *China's Nuclear Future*, edited by Paul J. Bolt and Albert S. Willner (Boulder, Colo.: Lynne Rienner, 2006), 96.

26. U.S. Department of Defense, *Ballistic Missile Defense Review Report* (Washington, D.C.: U.S. Department of Defense, 2010), 13.

27. James Miller, principal undersecretary of defense for policy, testimony for the Foreign Relations Committee Hearing on New START: Views from the Pentagon, June 16, 2010.

28. U.S. Department of Defense, *Nuclear Posture Review Report*, 34.

29. Lora Saalman, *The Carnegies Papers: China and the U.S. Nuclear Posture Review* (Washington, D.C.: Carnegie Endowment for International Peace, 2011), 22–26; Thomas Fingar, "Worrying about Washington: China's Views on the U.S. Nuclear Posture," *Non-Proliferation Review* 18, no. 1 (March 2011): 58–61.

via attacks on U.S. military and commercial satellites and computer networks appears to be part of China's A2/AD posture. If successful, this would degrade the capabilities of U.S. forces in Asia because precision conventional strike operations, military communications and navigation, unmanned aerial vehicles, real-time battlefield intelligence, and missile defenses all rely on satellites and computer networks. Reducing the effectiveness of these capabilities would make U.S. forward-deployed forces and allies more vulnerable to attack. U.S. officials and analysts fear that eventually China's A2/AD forces will make U.S. intervention in regional conflicts involving China extremely costly for the United States, thereby confronting U.S. officials with a choice between a high-casualty conventional war, resorting to nuclear escalation, or capitulation.³⁰

Conversely, it is unclear if attacks on U.S. military space and cyber assets would be successful. For instance, the intelligence requirements for a cyberattack on a specific network are demanding. An actor attempting to disable air defense radar via cyberattack would need detailed knowledge about the computer networks supporting the radar, such as the processing models, operating systems, Internet Protocol addresses, and security configurations. It would also need to disrupt networked backup computers. Therefore, even if an actor has enough intelligence to degrade a node in a system, it may not be able to achieve its desired effects.³¹ In space, Chinese officials likely would face similar uncertainty about their intelligence, the effectiveness of their counterspace weapons, and the ability of the United States to substitute terrestrial alternatives and new satellites for disabled ones.

However, China's counterspace attacks and cyberattack weapons might have a psychological impact on U.S. officials that would exceed the effectiveness of these capabilities. Official U.S. defense policy statements and documents reflect growing concerns about U.S. reliance on space and cyberspace. The principal deputy undersecretary of defense for policy, James Miller, recently said: "U.S. space capabilities allow our military to see with clarity, communicate with certainty, navigate with accuracy, and operate with assurance. Maintaining the benefits afforded to the United States by space is central to our national security, but the evolving strategic environment increasingly challenges U.S. space advantages."³² The 2010 *Quadrennial Defense Review Report* included simi-

30. For a discussion of China's A2/AD forces and strategy in official U.S. documents, see U.S. Department of Defense, *Quadrennial Defense Review Report*, 31–34; and U.S. Department of Defense, *Annual Report to Congress on PRC 2010* (Washington, D.C.: U.S. Department of Defense, 2010), 29–40. For detailed studies of China's A2/AD forces and strategy, see Jan Van Tol, Mark Gunzinger, Andrew Krepinevich, and Jim Thomas, *AIRSEA Battle: A Point-of-Departure Operational Concept* (Washington, DC: Center for Strategic and Budgetary Assessments, 2010), 17–47 and Roger Cliff, Mark Burles, Michael S. Chase, Derek Eaton, and Kevin L. Pollpeter, *Entering the Dragon's Lair: Chinese Anti-Access Strategies and their Implications for the United States* (Santa Monica, Calif.: RAND Corporation, 2007).

31. Computer Science and Telecommunications Board and Engineering and Physical Sciences, *Technology, Policy, Law, and Ethics Regarding U.S. Acquisition and Use of Cyberattack Capabilities*, edited by William Owens, Kenneth W. Dam, and Herbert S. Lin (Washington, DC: National Academies Press, 2009), 118–129.

32. Jim Miller, testimony for the House Committee Armed Services Subcommittee on

lar language about the military value of computer networks.³³ Worst-case scenario planning, lack of transparency between the U.S. military and the People's Liberation Army, and the difficulty of assessing vulnerabilities in space and cyberspace might lead U.S. officials to overly pessimistic conclusions about the vulnerability of U.S. C4 and ISR capabilities in crises.

Both countries' fears of quick and decisive nonnuclear strikes at the onset of a conflict could create nonnuclear first-strike instability. Chinese decisionmakers might believe that U.S. nonnuclear capabilities undermine their assured second strike, while U.S. officials might fear counterspace attacks and cyberattacks that would leave the United States "blind, deaf, and dumb" and therefore much less capable of deterring and responding to China's large arsenal of conventional missiles. Quickly losing the capability to marshal high-end forces at the start of a conflict would be the worst-case scenario for both countries, which might incentivize early action in a crisis. China might feel pressure to attempt to reduce the vulnerability of its nuclear forces by dispersing its small arsenal of mobile intercontinental ballistic missiles (ICBMs) or undermining U.S. C4 and ISR capabilities via counterspace and cyberattack operations. U.S. officials would have incentives to take early action to reduce the effectiveness of China's conventional strike forces before Chinese cyberspace and counterspace attacks degrade U.S. missile defenses, precision conventional strikes, and/or navigation in air and at sea. More important than that, both sides would fear that the other might attack first and gain an advantage. Fear of a blinding attack would create pressure for U.S. officials to launch attacks on military targets in mainland China at the first signs of interference in space and cyberspace, just as Chinese officials might see early counterspace and cyberattack operations as a low-cost/low-risk option for offsetting superior U.S. conventional and nuclear forces if they believed that the United States was preparing to attack.

An acute sense of vulnerability to a nonnuclear first strike among leaders in either country might cause miscalculations and misinterpretations in crises. The spectrum of counterspace attacks and cyberattacks ranges from disruptive to destructive and nonkinetic to kinetic. The United States has yet to articulate a clear threshold for the "infinite number of scenarios that are neither indicative of a minor harassing incident of jamming nor strategic attack" in space and cyberspace.³⁴ U.S. and Chinese officials likely will have differing views about the severity of nonkinetic disruptions that defy easy categorization. Chinese officials might conclude that nonkinetic interference with U.S. satellites would achieve China's objectives without triggering a U.S. military response because they would not cross traditional thresholds in the same way that dropping bombs, launching missiles, and killing people do. As an example, Chinese officials might authorize operations that attempted to temporarily disable satellites and radars that supported the GMD system, perhaps as suggestive escalation. U.S. officials, however, might interpret this as intolerable attack on their last line of defense against limited ballistic

Strategic Forces, March 2, 2011.

33. U.S. Department of Defense, *Quadrennial Defense Review Report*, 37–38.

34. General Susan J. Helms, "Schriever Wargame 2010: Thoughts on Deterrence in the Non-Kinetic Domain," *Air Force Space Command High Frontier* 7, no. 1 (2010): 14.

missile attacks. Similarly, the United States might anticipate an attack on its satellites and take precautionary actions such as launching penetrating ISR aircraft, which, due to their concerns about a nonnuclear first strike, Chinese officials might misinterpret as a conventional attack on China's nuclear forces.

If nonnuclear first-strike instability transforms a crisis into a war, the blurring of nuclear and conventional thresholds in U.S. and Chinese strategic postures could cause further inadvertent and miscalculated escalation. In particular, the potential overlap between China's conventional and nuclear missile forces could create a dangerous target ambiguity. China is reported to have both nuclear and conventional variants of its mobile medium-range ballistic missile, the DF-21.³⁵ As some experts have noted, China might co-locate some of its nuclear and conventional ballistic missiles in the same storage and basing facilities, or these forces might share some common C4 and ISR facilities.

For example, the radar installations that support China's conventional strike architecture might also function as part of an early warning system for its nuclear forces. In a conventional conflict, the United States might have strong incentives to attack or disable China's radar as part of a suppression campaign against China's conventional ballistic missiles, but Chinese officials might interpret these actions as compromising China's nuclear deterrent. In other words, U.S. and Chinese officials could perceive the same target as representing different thresholds.³⁶ That both countries likely would attack the other's C4 and ISR capabilities during a conventional conflict might further complicate efforts to distinguish between the nuclear and conventional thresholds. For instance, could China maintain both positive and negative control over deployed mobile nuclear-armed missiles with degraded command and control while the United States was attacking targets in mainland China? Would Chinese leaders know that the United States was only targeting China's nonnuclear, rather than nuclear, forces if U.S. officials chose to increase the number and targets of conventional strikes to compensate for reduced precision and less-effective ISR?

Escalation as a Maze

The preceding analysis demonstrates that the conditions that form the basis of Schelling's strategic concept would exist in a theoretical United States–China military confrontation. Both countries would have strong incentives to limit escalation, but their diverse strategic postures would create a multitude of kinetic and nonkinetic strike options, vulnerabilities, and opportunities for miscalculation and misinterpretation that could contribute to “a process that is not entirely foreseen, . . . reactions that are not fully predictable, . . . decisions that are not wholly deliberate, . . . [and] events that are not fully

35. U.S. Department of Defense, *Annual Report to Congress on PRC 2010*, 32, 34–35.

36. Morgan et al., *Dangerous Thresholds*, 80; Brad Roberts, “Strategic Deterrence Beyond Taiwan,” in *Beyond the Strait: PLA Missions Other Than Taiwan*, edited by Roy Kamphausen, David Lai, and Andrew Schobell (Carlisle, Pa.: Strategic Studies Institute, U.S. Army War College, 2009), 200; Christopher P. Twomey, “Asia's Complex Strategic Environment: Nuclear Multipolarity and Other Dangers,” *Asia Policy* 11 (2011): 64.

under control.”³⁷ It is logical to envision deliberate escalation as moving up the rungs of a ladder, yet deliberately limiting escalation in a United States–China war would be more challenging than simply not reaching for the next rung. Instead, it would be similar to navigating a maze: When U.S. and Chinese leaders employ force, they likely would not know in advance which threshold, or thresholds, they will cross. One could imagine best-case and worst-case scenarios, but the consequences of a wrong step would be impossible to predict.

Conclusion: Implications for the United States

Given these shared risks, what should the United States do? This is an open question. But it is clear that the risks of inadvertent and miscalculated escalation will only influence China’s actions if Chinese officials genuinely perceive them as risks. Threats to drag both countries toward a precipice ring hallow if the threatened party is unaware of the upcoming chasm. Schelling’s lesson for U.S. policymakers, therefore, is that they should cultivate China’s appreciation of the potential for uncontrollable and unintended consequences in military confrontations with the United States. David Lampton argues that power “is the ability to achieve one’s goals, whereas impact is the ability to affect others without having control over content and/or consequences.”³⁸

China’s emerging strategic forces would enable it to make an impact on the United States in military confrontations, but they do not guarantee that China would have the power to achieve its objectives. The United States should try to convey this distinction to China. Risks of unintended escalation might not deter Chinese officials if they believe that the survival of their regime is at stake. Chinese officials might be more reluctant, however, to authorize limited counterspace attacks, cyberattacks, and conventional attacks if their objective is to prevent a military confrontation from escalating and they are uncertain about their ability to control the consequences of their actions. A strategy to cultivate such uncertainty in China’s strategic calculus would include both competitive and cooperative measures.

Some such measures are already under way. For instance, in June 2011, U.S. secretary of defense Robert Gates outlined several of the political and military initiatives that the United States will undertake to sustain U.S. “commitments to allies while maintaining a robust military engagement and deterrence posture across the Pacific Rim.”³⁹ Deeper political ties with U.S. allies and partners and a conventional force posture and concept of operations commensurate with China’s emerging A2/AD capabilities appear to be the overarching goal of these initiatives. U.S. officials hope that such efforts will convey that the United States has core interests in Asia, reducing the likelihood of Chinese miscalculation. If forward deploying U.S. forces in Europe during the Cold War

37. Schelling, *Arms and Influence*, 95.

38. David Lampton, *The Three Faces of Chinese Power: Might, Money, and Minds* (Berkeley: University of California Press, 2008), 98.

39. Remarks by Secretary of Defense Robert M. Gates, Shangri-La Hotel, Singapore, June 4, 2011.

coupled the full arsenal of the U.S. military to NATO in the eyes of allies and adversaries, perhaps finding ways to maintain the U.S. role as a security guarantor in the face of China's increasingly capable military will have the same effect in Asia. At the very least, credible U.S. conventional military options deny China the ability to use military force in the region without risk of unwanted escalation.

However, if a major United States–China conflict is more likely to result from inadvertent escalation during a low-end crisis, U.S. officials should attempt to deter actions that carry a high risk of misinterpretation and miscalculation, such as counterspace attacks and cyberattacks. If some Chinese officials perceive U.S. space and cyberattack assets as force multipliers that they could temporarily disable without crossing dangerous thresholds, U.S. officials should disabuse them of this belief by emphasizing that U.S. responses to attacks on satellites and computer networks would be connected to the context in which these attacks occur and their effects, rather than their method and domain. For example, a nonkinetic attack that attempts to weaken the ability of the United States to defend itself against conventional missile strikes would not be exempt from kinetic retaliation, if appropriate, simply because it employs malicious software rather than bombs.

In fact, the United States might strengthen deterrence by being candid about the escalatory potential of degrading U.S. C4 and ISR. As an example, a U.S. official might deliver this message:

Even though the role and vulnerabilities of space and cyber capabilities are unique, attacks on them, as with other U.S. military assets, will trigger a response. You're right to conclude that we depend on space and cyberspace for accurate intelligence and precision strike, but you're wrong if you believe that undermining our accuracy and precision will deter us from responding. In fact, if you successfully make the U.S. military "blind, deaf, and dumb," you will have fundamentally altered our stakes in the conflict by challenging our ability to protect our forces and our allies, thereby stripping away our incentives to exercise restraint. Rather than deescalate the situation, you will have set in motion an uncertain process in which the United States could potentially employ whichever of its diverse capabilities it deems necessary depending on how the conflict unfolds.

This message does not commit the United States to specific responses. Nor does it make threats that are not credible, such as promising a nuclear response to an attack on U.S. satellites. Rather, it conveys an important reality: The United States likely would respond to counterspace attacks and cyberattacks in a military crisis, yet precisely what the United States would do—the consequences, likelihood of further escalation, and how it would end—would be impossible situations to predict and difficult ones to control. The situation following Chinese counterspace attacks and cyberattacks would heighten the risks of further escalation for both countries, but the United States likely would accept that risk depending on the severity of the initial attack.

There should also be a cooperative dimension of U.S. efforts to influence Chinese perceptions. After all, unintended escalation is a shared risk; efforts to dampen the concerns that would cause misperceptions and miscalculations are consistent with the goal

of a more stable United States–China military relationship. Just as Chinese officials could underestimate the risks of counterspace attacks, they might also overestimate the capabilities of U.S. nonnuclear strategic forces. Confidence building measures would help the United States provide Chinese officials with accurate information about U.S. nonnuclear capabilities. Chinese officials would be less likely to overestimate the vulnerability of their nuclear forces in a crisis if, for the previous five years, they had participated in regular technical discussions about and perhaps observed demonstrations of U.S. CPGS systems and the GMD system. These efforts might enhance crisis stability by diluting China’s incentives to take early action in military crises.

For instance, the United States could brief China and other countries on the number of CPGS weapons it plans to deploy (and someday deploys) and the types of scenarios in which it would consider employing them. It could also consider sharing some data about the technical characteristics of U.S. CPGS systems with China, inviting Chinese officials to observe CPGS exercises, and exploring potential verification regimes to demonstrate that CPGS weapons only carry conventional warheads.⁴⁰ Similar transparency arrangements are possible for missile defense. As an example, the United States has provided Russia with technical analyses of the missile defense systems it plans to deploy in Europe to demonstrate that they would not undermine Russia’s strategic nuclear forces.⁴¹ Perhaps the United States could brief China on the capabilities of the GMD.

The United States would need to determine how much information it should provide in these exchanges. U.S. officials must ensure that any GMD data they pass on to China would not, if leaked to third parties, weaken U.S. missile defenses against countries such as North Korea and Iran. Similarly, the United States has pledged to “work to ensure protection of our forces, allies, and partners in East Asia against all regional ballistic missile threats.”⁴² This policy objective would inhibit the United States from sharing some information about its short-, medium-, and intermediate-range ballistic missile defense systems with China.

The United States would also need to determine the extent to which information sharing should be contingent upon China reciprocating with information about strategic capabilities and programs that concern U.S. officials. China could provide more precise information about operational overlaps between its conventional and nuclear ballistic missiles or its views and doctrine for cyberattack and counterspace forces. China has thus far resisted U.S. efforts to elicit greater transparency on these issues. However, the United States might conclude that briefing China on the scope of emerging nonnuclear strategic forces, which might reduce risks of miscalculation by correcting misperceptions, is in its interests regardless of reciprocation.

In theory, working to reduce the likelihood of miscalculation and inadvertent escalation through greater transparency on strategic forces and doctrine would undermine

40. Committee on Conventional Prompt Global Strike Capability, National Research Council, *U.S. Conventional Prompt Global Strike: Issues for 2008 and Beyond* (Washington, D.C.: National Academies Press, 2008), 76.

41. Miller, Foreign Relations Committee Testimony, June 16, 2010.

42. U.S. Department of Defense, *Ballistic Missile Defense Review Report*, 33–34.

the threat that leaves something to chance. In practice, this is not the case. Although confidence-building measures likely would reduce Chinese uncertainty about U.S. capabilities in a crisis, they would not eliminate the risks of inadvertent escalation. At best, they would mitigate these risks. Moreover, U.S. efforts to enhance crisis stability before a conflict might impress upon Chinese officials the difficulty of controlling escalation and the importance of caution and restraint when both countries face a heightened risk of war.

Finally, the United States must consider how it would influence China's perceptions if a crisis escalates into a limited conventional war. A president likely would want options for suggestive escalation that convey to Chinese officials that the conflict is getting too dangerous. Schelling considered how the United States might accomplish this through limited nuclear strikes in a U.S.-Soviet war. For China, of course, any initial use of force likely would be nonnuclear—conventional attacks, counterspace attacks, or cyberattacks—and yet still, by definition, dangerous. Although any option for non-nuclear suggestive escalation against China must be tailored to specific situations, it would better to have thought through options for categories of scenarios in advance of an actual crisis.

21st-Century Extended Deterrence: Signaling Challenges in Multipolarity

Marie McLetchie

A landmark shift in the international balance of power shaped the immediate post–Cold War security landscape. Previously, the pursuit of bipolar parity defined the international security environment. Maintaining the balance of power in the bipolar world shaped the vital security interests of the United States, with each side carefully tending to its spheres of influence. After 1989, however, the United States’ sole competitor vanished seemingly overnight, leaving it as the lone superpower, yet still fettered to its Cold War alliances. Although the dramatic shift in the balance of power seemed to herald the triumph of American democracy and capitalism, it left international relations theorists and policymakers in the difficult position of addressing how the changing international structure should affect existing and future U.S. foreign policy commitments in light of emerging security challenges.

The primary U.S. security endeavor of the Cold War centered on balancing against the Soviet Union. The chief foreign policy mechanism to balance against the Soviet Union involved extending a security umbrella to U.S. allies and partners in order to deter Soviet aggression by throwing the weight of the United States behind a threatened ally. The U.S. security umbrella, known as extended deterrence, seemed like a logical extension of the Cold War security environment—the United States and USSR deterred each other from initiating aggression through an assured second strike capability. If either side were to launch a nuclear strike against the other, the initiator could be certain that its opponent would be able to respond with devastating force. Extended deterrence operated under the same logic, but rather than the United States threatening retaliation for any strike on its territory, the United States promised retaliation if any ally was endangered.

No matter the distribution of the balance of power, the international security arena is defined by states’ pursuit of their own security. In the Cold War, the United States and USSR used deterrence to enhance their security. But as the Cold War arms race dem-

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onstrated, the actions one state undertakes to make itself more secure may make other states less secure—a conundrum known as the security dilemma.

The security dilemma captures a basic reality of international politics—namely, anything one state does to make itself more secure (through arming itself, or making alliance commitments) can, and often does, make other states perceive themselves to be less secure. To mitigate the negative impact of the security dilemma to spectator states, a state endeavoring to increase its security may attempt to convey to spectators that the security-enhancing actions are not designed for future offensive purposes, or intended to maliciously decrease the security of others.

But what about the spectators in extended deterrence? A state engaging in an alliance seeks to enhance its security through the alliance. The state must commit to its alliance partner. In the extended deterrence alliance relationship, the security enhancing action will mean credibly demonstrating commitment. How will this demonstration of commitment appear to spectators? There is a tension between assuring an ally of commitment and minimizing the threat perceived by spectators.

The United States’ policymakers must determine the most effective method to balance its signals of commitment to its allies while minimizing the international perception of threat. The country faces a difficult international situation, and it thus needs to adopt a consistent foreign policy to ensure American security through international stability. The stability of the international system hinges in large part on the United States’ ability to effectively assure its allies and deter potential adversaries—if it can balance the two objectives. As it continues to be enmeshed in distant regions of the globe, it must credibly convey commitment in regions not in the immediate American periphery while minimizing the potentially dangerous consequences of alliances.

Background: The Shifting Balance of Power

The new security environment of the 21st century contributes to the need to reexamine extended deterrence and signaling. Initially, the nature of the new international structure and its effects proved to be contentious issues in the two decades following the disintegration of the USSR. Because “Realism focuses on the shifting distribution of power between states,”¹ international relations theorists have vigorously debated the form of the new structure, particularly focusing on the shifts from bipolarity to unipolarity, and from unipolarity to nascent multipolarity.² Concurrent with the initial shift in power from bipolarity to unipolarity, it appeared that both the policy and academic communities could adopt a new focus.³ The source of threats shifted from great power rivalry to

1. Jack Snyder, “One World, Rival Theories,” *Foreign Policy* 145 (2004): 53.

2. Christopher Layne, “The Unipolar Illusion: Why New Great Powers Will Rise,” *International Security* 17, no. 4 (1993): 7.

3. There is a robust literature that debates whether the fall of the Soviet Union created a unipolar world or an unbalanced multipolar world. This paper adopts the viewpoint that the post-1989 world has been unipolar and only since 2008 has unipolarity begun to wane. For a discussion, see Layne, “Unipolar Illusion,” 5–51; and Christopher Layne, “The Unipolar Illusion

the ever-present threat of terrorist groups, nonstate actors acquiring weapons of mass destruction, and rogue states.

The terrorist attacks on September 11, 2001, granted newfound primacy to non-state actors in U.S. security policy. As the balance of power shifted to unipolarity and the United States focused a significant portion of its intellectual capital and military resources on the new security threats, the historical emphasis on the balance of power among great powers waned, as did attention to alliance politics. As the unipolar moment gives way to nascent multipolarity, the dynamics of great power politics and alliances in particular will become increasingly important to U.S. security.

The existing security commitments at the end of the Cold War did not undergo significant scrutiny because the 21st century security environment was initially characterized by concerns over nonstate actors and rogue states. In particular, extending deterrence to European and Asian-Pacific allies seemed as if it were a secondary concern compared with international terrorism. Yet the shift to multipolarity makes extended deterrence worth reexploring, for two main reasons.

First, the shift of the international security environment away from bipolarity means that the United States will need to reexamine where it directs emphasis in foreign policy. Under bipolarity, the United States was primarily concerned with one source of threat. In the emerging multipolar environment, the number and type of threats has increased. Limited resources will no longer allow multiple global engagements or freedom of action. The United States can no longer focus solely on Russia while discounting the perceptions of other states. Under multipolarity, there are a greater number of actors whose beliefs and perceptions the United States must try to shape.

Second, it would seem that the priorities of states, and the United States in particular, have been drawn to a new center of gravity: terrorism and nonstate actors. Because terrorism has been the primary focus of the security environment since September 11, 2001, there has not been a significant amount of thought dedicated to reexamining how commitments “left over” from the Cold War operate in the 21st-century security environment. Will the same mechanisms that contributed to the success of Cold War alliances, specifically extended deterrence, continue to increase U.S. security by enhancing international stability?

Although the differences in extended deterrence in the 21st century may alter the underlying calculus of U.S. alliance behavior, the logic of extended deterrence and signaling is the same. Recalling the premise of the international relations school of Realism, “one of the most significant problems confronted by states in an anarchic environment is the uncertainty over others’ intentions and motives that can lead to counterproductive policies and suboptimal outcomes.”⁴ Will today’s extended deterrence commitments continue to reflect “vital” American interests in the 21st century? This uncertainty over

Revisited,” *International Security* 31, no. 2 (2006): 7–41; and William Wohlforth, “The Stability of a Unipolar World,” *International Security* 24, no. 1 (1999): 5–41.

4. Evan Braden Montgomery, “Breaking Out of the Security Dilemma,” *International Security* 31, no. 2 (2006): 183.

intentions is enhanced when a state is extending a security commitment. Are there deterrence posture options and capabilities that can better assure allies and deter potential adversaries? How does the credibility of the United States' commitment to its allies in one region affect the assurance of its allies elsewhere? Can assurance be sustained without tangible evidence of "vital" interest and capability?

To answer such questions, theorists and policymakers generally refine them to produce a question that has a quantifiable answer: "Do the benefits of maintaining the security commitment to extend deterrence outweigh the costs?" Built into the benefits/costs question, however, are vital assumptions that the current literature on extended deterrence and signaling has largely overlooked. The question "Do the benefits outweigh the costs?" really asks "Do the benefits outweigh the costs *for this ally*?" Whether or not the benefits will outweigh the costs depends not only on the ally but also upon external factors, such as audience costs. The state extending the deterrence commitment must consider international spectators—the audience—and the costs that may be incurred from extending deterrence.

Early research by the political scientist Paul Huth on the extended deterrent value of nuclear weapons suggested that "the contribution of nuclear weapons to extended deterrence has not mitigated the importance of the conventional balance of military forces in explaining deterrence success and failure."⁵ Further inquiry revealed that though conventional forces matter, they do not matter all the time. Specifically, if a defender had "a clear advantage in conventional forces, . . . then nuclear weapons had no discernable deterrent impact."⁶ The early research on extended deterrence focused primarily on the extent to which nuclear weapons and the balance of conventional forces affected the success of extended deterrence.

The subsequent policy recommendation cautioned the United States to "avoid the potential dangers of reciprocated nuclear alerts" as an element of extended deterrence.⁷ The means to convey commitment to extended deterrence have expanded significantly from crude inputs, such as nuclear alerts. Commitment can be conveyed through alliance commitments, which can include the forward deployment of troops, burden-sharing arrangements, and other seemingly lower-risk avenues to convey commitment that stop short of airborne alert.

For extended deterrence to be successful, especially in a multipolar environment, U.S. policymakers must explore the tension between alliance dynamics and signaling to strike a critical balance. The United States must balance the lessons of alliance security—that weak commitments allow more flexibility but increase the risk of misperception, with the concurrent pressures of signaling dynamics, which drive the state signaling extended deterrent commitment to fully commit to its ally.

5. Paul K. Huth, *Extended Deterrence and the Prevention of War* (New Haven, Conn.: Yale University Press, 1988), 271.

6. *Ibid.*, 284.

7. *Ibid.*, 288.

Understanding Signaling: An Evolving Process

To understand how the United States has previously used and can continue to leverage signaling for the purposes of extended deterrence, it is important to explore the model of signaling based on game theory and the conceptual interpretation of signaling given by political scientists.

The state creating the security dilemma must influence other states' perceptions of its image and give them reason to believe that the image projected is credible. Ameliorating all the negative effects of the security dilemma is more complicated, but in its simplest form, conveying information about intentions—its type—and thus altering other states' perceptions can reverse the security dilemma. Signaling is one of the tools that can be used to improve the security dilemma. Signaling is at its root related to game theory. Though this paper does not develop a game theoretic model, instead focusing on developing qualitative aspects of signaling, a basic understanding of signaling games is necessary to integrate alliance behavior into the cache of signals, and thus the canon of international security.

A basic signaling game is composed of two parties, a sender and a receiver.⁸ For extended deterrence purposes, assume the sender is a unitary actor. In this case, the state making the extended deterrence commitment as the “defender” is the sender. The receiver can be an individual state or a group of states. The receiver of the signal is more challenging to discern. The receiver can be the state entering into the alliance relationship, onlooking states in the international community (the international audience), or an institution such as the United Nations. For example, when the United States entered into NATO, the United States was the “sender” and the USSR was the “direct receiver.” Indirect receivers, the international audience of the signal, include states in the region (e.g., non-NATO members), other great powers (China), and nongovernmental organizations (the UN).

The sender conveys information about itself to the receiver by “sending” a signal. The signal can be an action, a statement, or some combination of the two.⁹ In a game theory model, the most interesting signaling games operate under the assumption that there is an asymmetry of information, and thus one party in the signaling game has incomplete information about the other party—and the signal will be used to communicate the missing information. In a game theoretic model, a common setup would be that State A knows its true “type” and State B does not know State A's type. Based on the signal, State B can assume with some probability the “true” type of State A.

In political science, signals can convey many things—resolve, assurance, and a state's “type.” Different intellectual approaches to signaling treat it as a vehicle to convey different messages. Characterizing signaling and giving it a succinct definition have

8. For an excellent breakdown of signaling games, see Martin J Osbourne, *An Introduction to Game Theory* (New York: Oxford University Press, 2004); and James D. Morrow, *Game Theory for Political Scientists* (Princeton, N.J.: Princeton University Press, 1994).

9. This paper deviates from the signal/indice divide laid out by Robert Jervis, *The Logic of Images in International Politics* (New York: Columbia University Press, 1989).

been a source of much debate throughout the political science literature, producing many variations on a common theme. The pertinent literature on signaling can be broken into three analytical categories. The Realist school of thought in international relations approaches signaling from two different camps: offensive realism and defensive realism. Rational Choice theorists build upon the Realist school, but approach signaling from a game theory perspective. Examining these three main analytic approaches to signaling will emphasize the renewed importance of signaling in the 21st century.

For offensive Realists, such as John Mearsheimer, signaling is simple. Offensive Realism assumes that “uncertainty is complete and invariant as well as determinative,” implying that states can never be truly certain of another’s intentions.¹⁰ Because of this inevitable uncertainty under offensive Realism, the security dilemma is severe. Given the precepts of offensive Realism, if State A takes actions to increase its security (perhaps through the acquisition of new military capability), neighboring State B will invariably be made less secure by State A’s acquisition, regardless of the intent behind State A’s actions.

Although Mearsheimer’s statement that “intentions are impossible to divine with 100 percent certainty” may be true, it is not fully descriptive of the international environment.¹¹ States must have some informational basis from which to develop perceptions and expectations about other states because states develop their own policies, at least in part, in light of their beliefs and expectations about other actors in the international system. Though offensive Realists may most fully describe how states operate in theory, in practice uncertainty is not absolute and states have incentives to reduce uncertainty through signaling.

Defensive Realists take a different view. The security dilemma can be mitigated through several means. Defensive Realists argue that security seekers will have an incentive to convey their security-seeking nature to each other, and they can do so by using the offense/defense balance to their advantage. “Defensive Realism minimizes the dilemma by implicitly suggesting that states know others’ preferences before revealing” their own preferences.¹² With similar analytic assumptions, Evan Braden Montgomery argues that states can attempt to break out of the security dilemma, focusing on determining “the conditions under which benign actors can reveal their underlying motives without also increasing their vulnerability.”¹³ This increase in vulnerability is a problem, for two reasons. First, “credible gestures are less likely to be made when they are most needed—when uncertainty is a significant constraint,”¹⁴ and second, “gestures sufficient to convey information are likely to be dangerous,”¹⁵ leaving states with a difficult trade-

10. *Ibid.*, 151.

11. *Ibid.*, 155.

12. *Ibid.*, 161.

13. *Ibid.*, 153.

14. *Ibid.*, 163.

15. *Ibid.*, 159.

off. To reduce uncertainty and increase its security, a state may therefore inadvertently make itself less secure through “credible gestures.”

James Fearon heavily influenced the Rational Choice approach to signaling through his extensive research on the topic. His conclusions, when combined with the previous literature on signaling, highlight the tensions ahead for extended deterrence and provide the basis for analyzing extended deterrence in the 21st century. He expands beyond the Realist offense/defense balance focus, acknowledging that “in the real world, states have opportunities to send a greater variety of messages to each other through multiple channels.”¹⁶ He describes the “unobservable factors such as private information about capabilities or ‘resolve’” that may influence how a state chooses to signal. And he defines a costly signal in two ways. A signal may be costly due to its ability to “generate *audience costs* that a leader might suffer if he backed down later.”¹⁷ First, and most intuitively, “the act of sending the signal is itself costly.”¹⁸ Cost can be dollars, territory, reputation (prestige), or people. Ultimately, he focuses on how backing down can be costly by addressing two different ways in which states can create costly signals—tying hands and sinking costs.

The concept of audience costs originated as a way to better explain politicians’ decisions in domestic politics. The concept of audience costs, however, can be extended to the international sphere in several ways. “The costliness, and hence credibility, of threats depends on the magnitude of the punishment that can be imposed by the domestic audience,” meaning that a leader must make credible threats to avoid the costs of backing down.¹⁹ The domestic model can be applied to the international scene. Most immediately, if a state backs down, it may incur an audience cost through its diminished reputation from the perspective of its adversaries. But its adversaries’ perceptions are not the only audience costs with which a state must be concerned; its allies within the region in question and beyond will be watching carefully. Because signals will also reinforce (or change) perceptions, audience costs can also alter how allies view each other.

Robert Jervis’s foundational work on signaling takes a different view concerning signals and cost. In *The Logic of Images*, he specifically focuses on “projecting images on the cheap.”²⁰ Yet he admits that “the images states can cheaply project are limited.”²¹ His work provides an excellent foundation upon which to discuss signaling, and this paper uses many of his terms. However, it does not make the distinction between signals and indices as he does, for two reasons.

First, Jervis defines signals and indices as separate categories; yet over the course of his book, he repeatedly describes scenarios in which a signal can become an index and

16. James Fearon, “Signaling vs. Balance of Power and Interests,” *Journal of Conflict Resolution* 38 (1994): 239.

17. *Ibid.*, 241.

18. *Ibid.*, 243 fn.

19. Kenneth A. Schultz, “Domestic Opposition and Signaling in International Crises,” *American Political Science Review* 92 (1998): 830.

20. Jervis, *Logic of Images*, 8.

21. *Ibid.*, 14.

vice versa.²² This distinction, though useful for his work on cheap talk and academically interesting, is too nuanced to characterize the varied amalgamation of actions that can be leveraged as signals. Additionally, the signal-index dichotomy has faded from political science discourse as game theory, which emphasizes signals with a broad definition, has become predominant.

Second, Jervis's distinction is less important analytically because it is unclear that signals are based on a "tacit or explicit understanding," as he believes they are.²³ It is possible, and indeed probable, that there are some basic understandings between actors in international relations, yet Jervis's assumption seems to undermine his very argument that focuses on the ambiguity of signals. Game theory literature on signaling adopts a wider definition that matches closely his definition of an index. For these reasons, this paper does not adopt the signal/index distinction and instead draws on Jervis's analysis while employing the broader understanding of a signal that is common to game theory.

With the increased importance of game theory, the distinction between talk and action has been blended. In this paper, a signal includes both "statements or actions that carry some inherent evidence that the image projected is correct because they are believed to be inextricably linked to the actor's capabilities or intentions" and "diplomatic notes, military maneuvers."²⁴ Because these categories manifest themselves in extended deterrence situations. Jervis rightly points out that "while the basic elements of an image may be difficult to alter, detailed aspects of it, which may strongly influence the way the perceiver acts, are more susceptible to change."²⁵

Costly signals are one such "detailed aspect" of a state's image that can be manipulated to reassure allies and reduce the threat to potential adversaries. By focusing on signaling, "a strong deterrence signal by the defender will be relatively likely to work in response, but due to the challenger's initial beliefs and choice of issue rather than (directly) due to the defender's superior military power."²⁶ Signals are important because they help update beliefs, which is especially significant in multipolarity. Signals can shape initial perceptions or serve to update a challenger's perception after a crisis has begun.

Multipolarity, Extended Deterrence and the Security Dilemma

Why examine signaling and extended deterrence? Extended deterrence is challenging in any international structure because it involves a commitment from a "defending" state

22. Jervis describes some actions as "usually more a signal than an index"; *ibid.*, 28. The fluidity of the distinction in his argument renders the dichotomy less useful than the subsequent analysis.

23. *Ibid.*, 20.

24. *Ibid.*, 18.

25. *Ibid.*, 14.

26. Fearon, "Signaling," 238.

to intervene, even when “the defender’s own territorial integrity is not threatened.”²⁷ Additionally, “the alliance dilemma is more severe in a multipolar world than in a bipolar system.”²⁸ Combining the precarious nature of extended deterrence commitments with the increased importance, and fragility, of alliances and how a state maintains its alliance commitments while managing the security dilemma increases the importance of signals. The key to the security dilemma is perception; traditionally, if the state that arms itself can convey to its neighbors that it arms for defensive purposes only, the security dilemma can be at least partially mitigated.²⁹

If the unique characteristics of signaling in a multipolar world are not examined, the possibilities for potential negative externalities associated with even the most well-meaning assurance of allies could be disastrous. Though signaling can be depicted as a purely political and diplomatic issue, the fact remains that even well-intentioned political or diplomatic actions are not without security consequences. As a state designs its foreign policy and attempts to assure its allies of its continued commitment, it is vital to understand the many forces surrounding these actions so as not to exacerbate the security dilemma.

The security dilemma creates a complex and counterintuitive set of incentives, whereby “sending credible signals of resolve often requires states to take actions that will entail a risk of war. . . . The act of signaling can thus lead to the very outcome that the signals were intended to prevent.”³⁰ States must balance the need to maximize an ally’s confidence in their commitment through signals while minimizing the risk of creating a security dilemma for neighboring states.

Polarity changes the importance of signaling. Under unipolarity, the unipolar power is predominant and generally enjoys freedom of action and no peers to challenge the unipole’s preeminence. Though the unipolar power may engage in signaling for any number of reasons, the stakes of the signaling game are lower. With no security threats from great powers, the risk of signal misperception is low not because misperception is less likely but because the cost of misperception will be low compared with the unipole’s power.

Multipolarity increases the importance of signaling. An increased number of great powers and a more even distribution of the balance of power create an environment where the audience receiving signals has more flexibility, capability, and perhaps motivation to carefully track signals as indicators of security trends and respond accordingly. The motivation to put more weight on signals is in part due to state type. It would take

27. Huth, *Extended Deterrence*, 271.

28. Glenn H. Snyder, “The Security Dilemma in Alliance Politics,” *World Politics* 36, no. 4 (1984): 492.

29. There is an argument to be made that the security dilemma is driven entirely by current capability or latent capability. This argument is primarily espoused by offensive realists. This paper adopts a view similar to that of defensive realism, that the security dilemma can be at least partially mitigated through communicating intentions.

30. Schultz, “Domestic Opposition,” 829, referencing Fearon.

another research agenda to examine how signaling influences different state types. This research assumes that the international audience consists of a range of state types, from status quo states to revisionist states. There are an increasing number of revisionist states with unprecedented means to alter the balance of power. Perception matters now more than ever.

Status quo states are those that are satisfied with the international system, and thus they do not seek to change it. “Status quo powers seek self-preservation and the protection of the values they already possess; they are security maximizers. . . . For status quo states, the potential gains from nonsecurity expansion are outweighed by the costs of war.”³¹ States with revisionist intentions, conversely, “value what they covet more than what they possess” which can translate into risk-agnostic or even risk-seeking behavior. Additionally, the lack of aversion to risk provides rationality behind a revisionist’s willingness to “employ military force to change the status quo and to extend their values. For revisionist states, the gains from nonsecurity expansion exceed the costs of war.”³²

Security seekers can desire to change the status quo to enhance their security. Though it may seem counterintuitive that a security seeker would initiate a conflict, insecurity and uncertainty about another state’s intentions can lead an otherwise “benign” or “good” state to employ bellicose means; this is the security dilemma. The security dilemma occurs when a state, in making itself safer, in turn makes another state less safe.

The category of revisionist security seeker allows for a state to have a relatively “benign” motive, security, yet for it to still desire to change the international order. Security seekers are driven away from the status quo to competition for security due to insecurity. Fear of other states’ motives and intentions pushes a security seeker to occasionally adopt an aggressive stance. Such an aggressive stance, however, is finite and not fundamental to its character. Security seekers may have limited revisionist aims—consider China and Taiwan.

If a security seeker does not signal, or does not signal *effectively*, the surrounding states may be faced with an exacerbated security dilemma. The problem of audience costs, for both domestic and international actors, “forces the government to be more selective about making threats,” which makes it paramount that these threats convey the intended message.³³ Multipolarity is inherently a more dynamic security environment—with an increased number of key actors with diverse capabilities and often-divergent security goals—that renews the importance of alliance relationships.

New Challenges for Signaling in Multipolarity

In the signaling game described initially above, State A knows its “type,” whereas State B does not. Effective signaling can correct this information asymmetry, and thereby

31. Randall L. Schweller, “Bandwagoning for Profit,” *International Security* 19, no. 1 (1994): 104–105.

32. *Ibid.*, 105.

33. Schultz, “Domestic Opposition,” 840.

State B can learn State A's true type. Status quo states, which are primarily focused on maintaining their current share of power in the international system, are minimally affected by the signaling that occurs around them. As an audience for signals, a signaling state need not be overly concerned about the audience costs of its actions on status quo powers. For revisionist state audiences, conversely, a misinterpretation of signals can have negative unintended consequences. In their search to alter the balance of power, revisionist states must look for any and all indicators of what other states value, and the lengths to which they will go to defend themselves and their allies. Though an alliance relationship is primarily between the defender, its ally, and a challenger state, in multipolarity there are many potential challengers. Similarly, security-seeking states depend on indications from other states in the international community to determine the steps necessary to maintain their current level of security.

What if State B's ability to learn the true type, as the signal receiver, is not State A's desired outcome? Yet, simply because learning the true "type" is possible does not mean that learning will occur, or is even desirable, because states "try to project desired images, whether accurate or not, and skeptically view the images projected by others."³⁴ Though signaling may be used to reveal a "true" type, signals may also be manipulated to project a false image of commitment or resolve. In this situation, there may be incentives for State A to deceive State B. Signaling is further complicated by the chance that State B may misinterpret the signal; after all, it is only with a certain probability that State B learns the true type; it is not a definite outcome of the model, by any means. Furthermore, the receiving state may be predisposed to its existing perceptions, and it may take repetition of the same signal, multiple signals of varied types, or perhaps a very costly signal to change the receiver's perception.

Given the possibility that State A, the sender, may be deliberately using signals to attempt to deceive State B, how can signaling convey any useful information? That is, if signals can be used to both deceive and assure alliance partners and spectators alike, under what circumstances can a receiver know that it has received an honest, and thus credible, signal? One way to increase the credibility of a signal is to increase its cost. An increase in cost may convince a skeptical receiver. Costly signaling presumes that if a signal is expensive to send (in reputation, power, or otherwise), then the signal will be more credible because a state wishing to deceive would (presumably) be unwilling to pay a high cost.

However, "when the gains of projecting a given image are high, a deceiver as well as an honest actor may be willing to take risky and costly actions."³⁵ Costly signals are *more* credible, but if the potential gains are lucrative enough, even costly signals may be used to deceive. Because of the increased number of actors, signaling may entail an increased risk that was not present during the Cold War. Specifically, costly signaling may increase the risk associated with alliances or extended deterrence and may decrease the overall security of the signal sender.

34. Jervis, *Logic of Images*, 15.

35. *Ibid.*, 20.

What if the reverse occurred? What if the receiver of the signal of commitment, State B, was attempting to feign a lack of faith in State A's commitment? If State B continued to feign insecurity, State A would overcommit and lock itself into a course of action that it would rather not take, but that it must to maintain its reputation for upholding commitments—entrapment. Entrapment in international security can occur in two ways. The ally can entrap the defender, or the international audience (whether the challenger or a third party) can “lock” the government in by creating high audience costs. Whether the costs are for domestic or international audiences, “exposure to sufficiently high audience costs can ‘lock’ the government into a war it would rather not fight.”³⁶

The potential for entrapment creates a perverse incentive—State A does not want to overcommit, and thus should pursue a course of weak commitment. If weak commitment to extended deterrence is pursued, the ally may not be assured of its alliance and thus may take actions to ensure its own security. At the same time, the weak commitment will leave the defender, State A, appearing fickle to its audience—both other allies and potential adversaries. A misstep in extended deterrence has ramifications for all alliances; allies may doubt resolve. The same misstep will allow a revisionist state to believe that it can pursue its aims altering the balance of power with a greater likelihood of freedom and lower chance of resistance.

Given those concerns, what can the United States do differently in the new security environment than previously? Extended deterrent relationships may not resemble Cold War-era deterrence, and thus the United States must work to shape its allies' expectations in the new environment. NATO involved carefully calibrated sharing arrangements involving U.S. weapons and allied countries. There are significantly more pitfalls to this now due to an increase in the number of actors. Previously, “alliance bargaining considerations . . . tend[ed] to favor a strategy of weak ambiguous commitment.”³⁷

However, weak commitment does not reassure the ally, which may fear abandonment, and further may not deter the adversary due to ambiguity. This was true in the Cold War, but the problem is exacerbated with multiple audiences. Extended deterrence relies much more heavily on nonmilitary means to communicate commitment to allies than it did during the Cold War, due in part to the pressures to commit while minimizing risk. If signals are expensive, one approach is to reduce the demand. To make 21st-century extended deterrence successful, the United States could limit its alliance relationships, both in depth and breadth, while carefully evaluating any signaling opportunities. Committing too strongly to many allies would leave the United States in a weak position in which it could not possibly honor all its commitments. But if it were to reduce the depth of its commitments to its allies while also limiting its number of commitments, the opportunity for misinterpreted signals would decrease and it would retain freedom of action while honoring only its most vital commitments.

36. Schultz, “Domestic Opposition,” 830.

37. Snyder, “Security Dilemma,” 467.

Future Implications

The relationship of the United States and its Asia-Pacific allies serves as a key example of the continued importance of extended deterrence. The United States' security commitments to its Asia-Pacific allies are products of the Cold War. Yet, with the fall of the Soviet Union, the Communist threat no longer looms large. Certainly, the gradual rise of the People's Republic of China is cause for strategic pause, but it would seem that the initial underpinnings of America's commitment to its Asian allies have evaporated. A Japanese publication on the matter states that "in the post-Cold War environment, Japan only has the option of relying on the extended deterrence of the United States if a nuclear threat emerges from regional states, yet there is a danger that elements that ensured its continued effectiveness have been lost."³⁸ In part, this statement could be referring to U.S. capabilities to project power to the region; but the scholarly literature also suggests that the Japanese, as well as other U.S. allies, fear desertion by the United States. How, then, do the perverse preferences among alliance politics, signaling, and extended deterrence operate?

Examples from the Cold War may be instructive in the new multipolar environment. Thus, if the Soviet Union had undertaken large troop reductions, "even [those] would be made without sacrificing security; . . . these decreases in conventional forces could more easily be regarded as a rational military modernization rather than signs of nonaggressive preferences."³⁹ Even though the troop reductions were meant as a presumably straightforward signal of emerging nonaggressive preferences, there was still room for misinterpretation. Given the increased number of audience members and the increased importance of signaling to mitigate the security dilemma, how can the United States leverage signaling to reduce the chance of conflict in the Asia-Pacific region?

States may use war "as a credible means to reveal private information about their military capabilities. Thus, a rising state may seek out armed conflict in order to demonstrate that it is more powerful than other states realize."⁴⁰ This scenario is particularly troubling, given that China continues to assert its power in its near periphery. Especially in cases where "the territory in question is strategically vital or economically important, its transfer could radically increase a state's future bargaining leverage."⁴¹

U.S. interest in the Asia-Pacific region can be classified as a strategic interest—"an interest in keeping the ally's power resources out of the opponent's hands"—and refers to "the need to block an increase in the adversary's power."⁴² However, the literature on alliance politics suggests that when a state (the defender) has made clear its strategic investment in an ally, the ally may then exploit the commitment of the defender to the detriment of both.

38. Quoted, in translation, by Llewelyn Hughes, "Why Japan Will Not Go Nuclear (Yet)," *International Security* 31, no. 4 (2007): 78.

39. Montgomery, "Breaking Out," 177.

40. James D. Fearon, "Rationalist Explanations for War," *International Organization* 49, no. 3 (1995): 400–401.

41. *Ibid.*, 408.

42. Snyder, "Security Dilemma," 472.

Conclusion

The security dilemma captures the basic reality of international politics: Anything one state does to make itself more secure (through arming itself, or making alliance commitments) can, and often does, make other states perceive themselves to be less secure. States can attempt to increase their security by making alliance commitments, such as extended deterrence, but by doing so a state may exacerbate the security dilemma for others. To mitigate this potential decrease in other states' perception of security, states can signal to others their benign intent. However, signaling benign intent often works at cross-purposes with assuring an ally. The preferred signaling method of the Cold War, costly signaling, is no longer an effective mechanism to increase security under multipolarity: "Even when the signal is costly, however, this will not in general completely eliminate all risk of war by miscalculation. . . . To be genuinely informative, . . . a signal must be costly in such a war that a state with lesser resolve or capability would not wish to send it."⁴³

Occasionally, costly signals are useless if they are not sufficiently costly. Yet at what risk does the United States employ very costly signals? "From the perspective of foreign states, the answers to such questions are harder to observe than, say, the number of tanks and airplanes each states possesses."⁴⁴ An effective costly signal in multipolarity is more nuanced. As is discussed above, the nuances lie in the signal itself—what the signal attempts to convey, whether resolve, credibility, commitment, or "type," as well as which type of signal is employed—so there is more than one way to make a signal "costly." The United States must ensure that a costly signal does not send the message that it is prepared to fight only to reveal "that its capabilities remain better than most believe."⁴⁵ To minimize the increased risks of a multipolar world, U.S. policymakers must determine the most effective method to balance signals of commitment to its allies while minimizing international perceptions of threat.

43. Fearon, "Rationalist," 397.

44. Schultz, "Domestic Opposition," 832.

45. Fearon, "Rationalist," 401.

The Impact of Budget Uncertainties on the Department of Defense’s Research and Development Programs

Kevin M. Mueller

Current research and development (R&D) efforts will play a pivotal role in defeating emerging nuclear threats. However, the R&D procurement process is ill suited to address these types of threats. The informal Department of Defense (DoD) definition of “success” and a lengthy acquisition timeline create issues for existing programs. Continuing resolutions amplify these issues by increasing the contractual burden on personnel, decreasing available funding, and creating a shorter schedule to meet the obligation goals of the Office of the Secretary of Defense; the net result of these conditions is ineffective planning and program execution. Improving the flexibility of the R&D acquisition process has the potential to mitigate some of the impact of continuing resolutions. The overarching goal should be to maximize planning effectiveness while minimizing the effects for technologies and performers. To meet this goal, DoD must change its measure of success for R&D programs. It should take additional steps to foster interagency cooperation and define a more uniform R&D procurement process across agencies.

The Incentive to Improve

“Of the threats we face, weapons of mass destruction clearly represent the greatest threat to the American people, particularly when they are pursued or possessed by violent extremists or state proliferators.”—General Robert Kehler, commander, U.S. Strategic Command

A successful improvised nuclear device attack against the United States would be a game-changing event for U.S. domestic and foreign policy. The ensuing economic and humanitarian crises would likely create long-term issues for financial markets and the health care system. The concept of national security would change, leaving a permanent scar on the national psyche. Thinking about the consequences of nuclear terrorism thus

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provides an incentive to improve intelligence gathering, engage with international partners, and develop next-generation detection technologies. As the Commission on the Prevention of WMD [Weapons of Mass Destruction] Proliferation and Terrorism stated in 2008: “Unless the world community acts decisively and with great urgency, it is more likely than not that a weapon of mass destruction will be used in a terrorist attack somewhere in the world by the end of 2013.”¹

It is imperative for the United States to act quickly and with resolve to develop new detection technologies to locate, identify, and interdict nuclear weapons. The *2010 Nuclear Posture Review* identifies the prevention of nuclear terrorism as one of five key objectives of U.S. nuclear policy and posture. But even with advancements in detection technologies, failure to prevent nuclear terrorism is possible. For this reason, new nuclear forensics approaches must be developed in parallel with these technologies to facilitate consequence management and the collection, analysis, and interpretation of debris from nuclear explosions.

The Department of Energy (DoE), Department of Homeland Security (DHS), Department of Defense (DoD), Department of Justice, Department of State, Nuclear Regulatory Commission, and Office of the Director of National Intelligence cooperate to counter the threat of nuclear terrorism. DoE provides technical expertise through the National Nuclear Security Administration and national laboratories. The DHS Domestic Nuclear Detection Office is responsible for the development of the Global Nuclear Detection Architecture—a multilayered system of detection technologies, programs, and guidelines to enhance the nation’s ability to detect and prevent a radiological or nuclear attack. DoD has the unique responsibility for military operations and force protection outside the continental United States, as well as a key role in the support of civil authorities. The existence of multiple interagency partners with unique but symbiotic roles underscores the threat posed by nuclear terrorism.

The Defense Threat Reduction Agency (DTRA) is charged with executing DoD’s mission to develop novel technologies to defend the United States against nuclear threats and terrorism. These technologies are uniquely designed to endure the harsh but distinct environmental conditions often encountered by DoD personnel. The Nuclear Detection and Forensics Technologies Division of DTRA performs applied research and advanced technology development in both nuclear detection and forensics, with an annual budget of approximately \$115 million.

Research and Development

State-of-the-art commercially available technologies are not sufficient to fully address the threat of nuclear terrorism. These types of challenging problems are addressed by re-

1. Commission on the Prevention of WMD Proliferation and Terrorism, *World at Risk: The Report of the Commission on the Prevention of WMD Proliferation and Terrorism*, Bob Graham, chairman, and Jim Talent, vice chairman (New York: Vintage Books, 2008), xv, available at www.absa.org/leg/WorldAtRisk.pdf.

search and development (R&D) programs, which push the envelope of basic and applied research. Naturally, R&D has a higher technical risk and lower success rate than traditional acquisition. Complex technical hurdles often cause schedule slips, cost overruns, and issues with meeting performance goals. History suggests accurately that estimating the complexity of R&D programs is challenging. As Henry Ford put it, “If I’d asked people what they wanted, they would have said faster horses.”

DoD’s customers are not usually experts in the latest technology advances; thus, some degree of freedom in R&D is necessary to find the right technology to meet the needs of a customer. This environment is one reason why R&D programs tend to have “loose” requirements and a strong emphasis on “technology push” over “technology pull.” In contrast, traditional acquisition programs have more rigid requirements.

In traditional acquisition programs, a Capability Development Document (CDD) defines the key performance parameters of the desired system—some of which are satisfied by R&D technologies. The development of the CDD is led by a program office, the formal interface between the user and the R&D office.

R&D enterprises typically “push” technologies because R&D frequently occurs before the development of the CDD. Most R&D programs have not designated a program office for transition until they have achieved a reasonable level of performance. The acquisition partner must have confidence that the technology under development will meet or exceed its capability needs.

R&D Funding

Congress provides specific appropriations for R&D activities. Research, development, testing, and evaluation (RDT&E) funding is one of the five major budget appropriation categories, which also include procurement, operations and maintenance, military personnel expenses, and military construction. R&D programs have two years to obligate RDT&E funding.² The funds are then available for expenditures for an additional five years.³

Planning, programming, budgeting, and execution (PPBE) is the rigorous and time-consuming process used by DoD to justify and defend budget requests. According to the U.S. Government Accountability Office, PPBE is inflexible and incapable of addressing emerging requirements.⁴ The example of the 2011 nuclear disaster in Fukushima underscores the need for programs to be flexible. Emerging requirements for new technologies can cause abrupt changes in R&D priorities and result in funding realignments, which can rapidly increase the amount of funds in an R&D program. The flexibility of the R&D procurement process determines how effectively a program can address these requirements.

2. Obligations legally bind the government to make a payment.

3. Expenditures are payments for products or services billed to the government.

4. U.S. Government Accountability Office, *Best Practices: An Integrated Portfolio Management Approach to Weapon System Investments Could Improve DoD’s Acquisition Outcomes*, Report to Committee on Armed Services, U.S. Senate (Washington, D.C.: U.S. Government Printing Office, 2007).

Process: The Source of Inflexibility

Technology readiness levels drive the transition of R&D technologies to a traditional acquisition program. In contrast, the PPBE process is calendar driven. R&D programs must provide a five-year projection of funding and personnel levels as input to the Program Objective Memorandum (POM). As Rear Admiral (Select) Mark Kenny, the director of the Navy's *Information Warfare* Office, explains, "When we're challenged to lay out a five-year programming and budget plan, the so-called POM, our retort is that we will . . . when al Qaeda gives us their five year plan."

The R&D procurement process is the primary barrier to R&D progress. R&D achievements and the success of the program are secondary to a focus on the process. Successful R&D often requires the development and integration of several unique technology projects, which are led by subject matter experts. Many of the technologies require multiyear development efforts and many will fail.

DoD's R&D Success

To be successful, DoD's R&D programs need the ability to rapidly obligate and expend funds. The Office of the Secretary of Defense (OSD) provides commitment, obligation, and expenditure goals. For example, RDT&E funds are available for expenditures for a total of seven years; however, OSD expenditure goals create pressure to spend the funds in just over a year and a half.

Pressure is generally exerted through a threat to reduce the funds available to a program in current or future fiscal years. OSD offers no extensions, even in extenuating circumstances. During fiscal year 2011, R&D programs felt pressure to be at obligation goals only one month after the end of the continuing resolution, which lasted for 200 days.

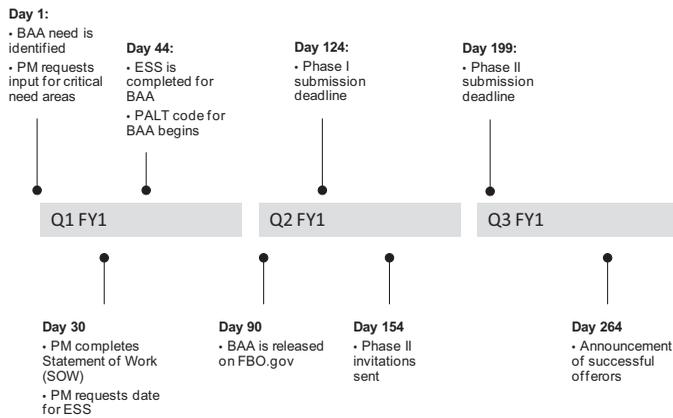
In addition, the informal DoD definition of success encourages program managers to "protect money at all costs." Certainly, there are some cases where government waste results from the need to achieve OSD goals.

A Process in Action

A "funding requirement" is the amount of funding needed for a specific project. R&D programs prepare "spend plans," consisting of multiple funding requirements up to six months before the beginning of the fiscal year. Spend plans are based on assumptions; thus they do not account for continuing resolutions, budget uncertainties, or emerging requirements.

The process of going from need to obligation is time consuming. Policy requires full and open competition in government acquisition whenever possible. The broad area announcement (BAA) is one method of satisfying the requirement for full and open competition. Research solicited under a BAA is meant to increase knowledge in science and advance the state of the art. Figure 1 shows a typical timeline for a BAA.

Figure 1. Typical Competitive Acquisition Timeline for a Broad Area Announcement

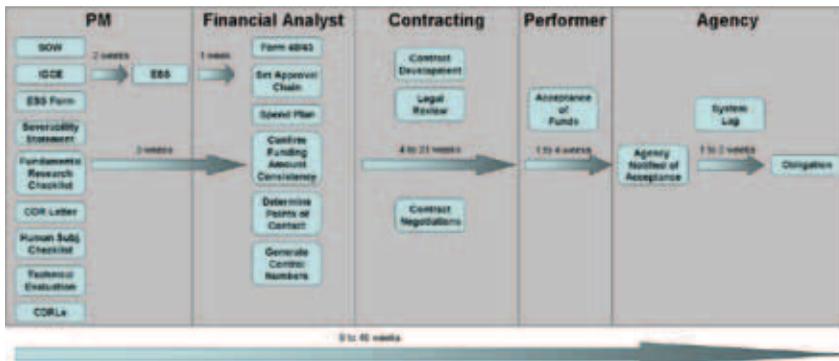


Note: BAA = broad area announcement; PM = project manager; ESS = engineering systems solution; PALT = project, performer, and procurement action lead time.

Source: Created by the author.

The BAA process follows a rigid schedule, with the example shown in figure 1 spanning 270 days. The OSD obligation goal 270 days into the fiscal year is 67 percent. However, obligation does not occur at the end of the BAA process. The funding package is first released after the BAA process ends. Figure 2 shows a typical timeline to progress from a funding package to obligation, which can take an additional 200 days.

Figure 2. Timeline from Initial Document Development to Obligation



Source: Created by the author.

The timeline begins with the development of the funding package. One of the more important documents in the funding package is the severability statement, which is a determination of whether the government receives value in the event that the project is canceled. At some agencies, all nonseverable efforts must be fully funded at the time of the award, which is nearly impossible in a continuing resolution because limited funding is available.

The process is slightly different for each agency; however, a funding package typically needs approval from 10 to 20 individuals. The project, performer, and procurement action lead time (PALT) code provides an estimated timeline for the process. The PALT code ranges from 30 to 220 days and is often in addition to a 260-day BAA process. The PM has no control over many of the events leading to obligation. Scheduling, vacations, training, and duplication of efforts from moving funding from one from one government agency to another often create additional delays in the process—ultimately resulting in delays fielding technologies with the potential to defeat nuclear terrorism.

A Case in Point: The Continuing Resolution

The Impact on Planning

Continuing resolutions occur when Congress fails to pass an appropriations bill, which has happened in 30 of the past 35 years. The continuing resolution is a temporary measure providing funding at the same levels as the prior fiscal year. One potential risk mitigation technique is to fund a project into the following fiscal year, beyond the typical length of continuing resolutions. However, some agencies prohibit periods of performance extending beyond the first quarter of the next fiscal year. As a result, technology projects need immediate funding when the fiscal year begins.

Unfortunately, budgets during a continuing resolution are only a fraction of a typical yearly budget, proportional to the length of the continuing resolution. To avoid a “stop work” situation at the beginning of the fiscal year, project managers often develop unrealistic spending plans. The spending plan projects an obligation rate that the project manager knows will not be met but is appealing to the leadership because it suggests the potential for meeting OSD goals. The project manager understands the necessity of creating a false plan to gain the required funding for his or her project. Even with a false plan, many technology projects will still require several funding obligations to avoid a stop-work order, significantly increasing the strain on government personnel. The result is duplication of effort and greater inefficiencies.

Changes in agency priority also create issues with the distribution of the budget. In response, some agencies issue budget drills. Responses to the budget drill enable agencies to determine the risks associated with decreasing program budgets. Unfortunately, the timing could not be worse. Personnel who are already overwhelmed by the preparation of funding packages can spend days preparing responses to budget drills.

Funding from each continuing resolution can take weeks to percolate to the program level. Continuing resolutions explicitly prohibit new start-up technology projects from

receiving funding. Over Guidance Initiative funding, or funding provided to accelerate development or begin research in a new area, is also not available during a continuing resolution.

Continuing resolutions place a continuing administrative burden on the organization. Project managers, financial managers, contracting officers, and their respective approval chains must reaccomplish and approve funding packages to provide a continuous stream of funding to performers. In essence, continuing resolutions create a reactive rather than proactive planning environment. Instead of planning for the next generation of systems to combat nuclear terrorism, project managers are planning how best to maintain current efforts in a tenuous budgetary atmosphere. Instead of visiting performer sites and evaluating current progress on systems, project managers are back at the organization's office reworking funding documents. And instead of starting new projects to develop to combat the nuclear threat, project managers are left waiting for the resolution of a political battle.

The Impact on Performers and Technology Projects

Each continuing resolution requires an enormous contractual effort to incrementally fund technology projects. This process is especially cumbersome if an R&D program has a portfolio consisting of many smaller, complex technology projects. Each new continuing resolution creates a larger backlog of funding packages for personnel. Some technology projects experience a significant reduction in funding, which also corresponds with non-trivial replanning efforts.

Reductions in technology project funding can result in the reassignment of personnel and a slowdown or possible halting of the effort. The loss of experience and technical knowledge is damaging to the long-term mission goals of the technology projects and higher-level systems for combating nuclear terrorism. The residual effects of the continuing resolutions cause R&D programs to lag behind both OSD goals and their own plans, placing current or future funding at risk for removal, and thereby decreasing the likelihood that a product will help mitigate the threat of nuclear terrorism.

Recommendations for Improvement

DoD's Metrics for Research, Development, Testing, and Evaluation

DoD needs a fundamental change in its culture. Its informal definition of success encourages program managers to "protect money at all costs." But in the current budget environment, the United States cannot afford this type of thinking. As a start, OSD's metrics for RDT&E funding must differentiate between R&D and traditional acquisition programs of record.

OSD obligation goals for R&D programs should have a profile extending to the life of the availability of funds for obligation, which is two years for RDT&E funds, instead of pressuring program managers to obligate funds within the first year of the appropriation. OSD expenditure goals for R&D programs should have a profile extending until the

funds are canceled, or an additional five years from the end of the two-year obligation period for RDT&E funds.

Progress over Process

Emerging requirements challenge the R&D procurement process. The process should not be a significant barrier to successful R&D. DoD should develop an R&D-specific funding vehicle capable of expediting new technology efforts, enabling them to begin no later than 30 days from the identification of a requirement.

DoD's R&D programs exist to protect U.S. interests and citizens by providing cutting-edge technologies to the warfighter. The decisions of all agency personnel, not just managers, have an impact on the progress of life-saving technologies. DoD must proactively define a streamlined process for R&D procurement. The process should be applied consistently across agencies and over multiple fiscal years when necessary, while maintaining enough flexibility to address unique situations.

Preparation for Continuing Resolutions

Funding technology projects into the second quarter of the following fiscal year will significantly decrease the impact of continuing resolutions on planning, technology projects, and performers. Lower expenditure rates are one argument against this recommendation; however, this only confirms that OSD's expenditure goals for R&D programs must have expenditure profiles that extend the life of the appropriation.

Agencies should distribute continuing resolutions on a percentage basis. In other words, a program with 10 percent of the agency budget should receive 10 percent of each continuing resolution. The process should be applied at the enterprise, directorate, division, and branch levels. Low obligation rates are not an excuse to withhold continuing resolution funding.

Interagency Reforms

As the world's largest buyer, the U.S. government should be able to leverage its \$750 billion in annual purchases. However, excessive rules impede robust interagency cooperation. The result is an inability to cooperatively fund programs, to collaborate on the transfer of technologies between agencies, and to prevent the duplication of technology projects.

One example of the challenges for interagency cooperation is the procurement of DoE services by DoD. DoE has not certified that it will comply with Section 801 of the Fiscal Year 2008 National Defense Authorization Act (PL 110-181). As a result, the director of defense procurement and acquisition policy is required to issue a waiver each fiscal year stating that "it is necessary in the interest of the Department of Defense to continue to procure property and services through the nondefense agency during the fiscal year." Each year, technology projects are slowed or stopped because the Section 801 waiver is not in place by the beginning of the fiscal year.

In March 2011, the Government Accountability Office published a report on duplication in government programs.⁵ This report found that robust interagency cooperation has the potential to minimize duplication while serving as a hedge against funding uncertainties, particularly during extended periods of continuing resolutions. Interagency partnerships can also provide additional technical expertise to technology projects and cost-sharing opportunities.

Conclusions

The potential impact on U.S. national security is a strong incentive to improve the R&D procurement process. Acknowledging the difference between traditional acquisition and R&D procurement is important. Because the complexity of R&D technologies is frequently uncertain, there is no guarantee of technical success in R&D. Even though some programs may not achieve technical success, the ultimate measure of success is mitigating the threat of nuclear terrorism.

Unfortunately, the key metric that measures program success in DoD is OSD's financial goals. R&D programs do not align well with these goals, leaving them susceptible to budgetary uncertainties. To address these uncertainties, DoD must change its measure of success for these programs. OSD should start by amending the obligation and expenditure goals to extend the life of the appropriation.

Even though the threat of nuclear terrorism is unlikely to diminish, history suggests that policy is often more reactive than proactive. Emerging technologies, strategies, and changing requirements call for a flexible R&D procurement process. Much of the inflexibility in the current process stems from the tremendous contractual burden required to progress from an idea to a funded project, which can take more than a year and is further complicated by continuing resolutions. Some of this inflexibility is mitigated by interagency cooperation.

Cooperation and collaboration is also a valuable means to advance technologies, even during continuing resolutions. The current system inadvertently prevents many collaborative efforts by creating layers of bureaucracy. Reforming this process to enable cooperative funding, encourage technology transfer, and reduce duplication of effort will ultimately benefit both the fight against nuclear terrorism and the U.S. taxpayer.

The R&D procurement process is ill suited to address the threat of nuclear terrorism. The interdiction of an improvised nuclear device will require significant advances in antiterrorism capabilities, which will only be provided by technologies resulting from successful and timely R&D programs. But such programs are extremely challenging to implement, given the current cumbersome, inflexible procurement process. Ironically, the R&D procurement process, which has the strongest potential to defeat nuclear terrorism, may be the greatest threat to U.S. national security.

5. U.S. Government Accountability Office, *Opportunities to Reduce Potential Duplication in Government Programs, Save Tax Dollars, and Enhance Revenue*, Report GAO-11-318SP (Washington, D.C.: U.S. Government Printing Office, 2011).

Assessing the Prospect of China’s Potential “Sprint to Parity”

Caroline S. Reilly

This paper seeks to evaluate the likelihood of China’s nuclear arsenal expanding in a “sprint to parity” aimed at matching the size of U.S. and Russian strategic forces, and in doing so gauge the extent to which this possibility should have an impact on the feasibility of further reductions in U.S. and Russian nuclear arsenals. It is structured in five sections. The paper begins with a description of the logic underlying the “sprint to parity” claim and highlights the ways in which this scenario has arisen in national security and arms control debates. The second section examines the current attributes of China’s nuclear forces in combination with the strategic rationale that is believed to guide those capabilities; and the third section presents a similar review of ongoing and anticipated improvements and trends in China’s nuclear arsenal. The fourth section details a number of efforts that China has seemed to eschew that would have enabled more ambitious nuclear weapons capabilities, if its leadership had strongly desired numerical parity. Together, these three sections suggest that the threat of China’s “sprint to parity” overstates the aim of its nuclear modernization program; inappropriately presupposes Chinese emphasis on absolute differences between the nuclear arsenals of potential adversaries; and, to an extent, misinterprets actions that China has (not) taken throughout its history as a nuclear weapon state. Finally, the paper offers policy recommendations that might allow the United States to prevent this issue from hindering future arms control agreements that include monitoring a set of leading indicators of a potentially expanding Chinese nuclear arsenal, maintaining a robust nuclear weapons complex, and building a deeper confidence in the nuclear deterrent relationship between the United States and China.

Introduction

“Sprinting to parity” has sometimes been posited as a potential Chinese reaction to cuts in U.S. and Russian nuclear forces as the two countries engage in further rounds of

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nuclear arms control. According to this scenario, shrinking U.S. and Russian strategic forces will “lower the bar” of achieving arithmetic equivalence and encourage China to augment its nuclear capabilities to match (or even surpass) the size of U.S. and Russian arsenals.¹ Proponents of this position advocate maintaining a large nuclear arsenal relative to China as the most effective way to hedge against this possibility, making the prospect of achieving numerical parity with the United States and Russia a prohibitively costly endeavor.²

Concerns about a rapid Chinese nuclear buildup are reflected in U.S. policies and national security debates. Testifying in 2002 before the Senate Armed Services Committee on the implications of ratifying the Moscow Treaty, U.S. secretary of defense Donald Rumsfeld replied to criticism that the treaty should have mandated deeper reductions by asserting that an arsenal of 1,700 to 2,200 nuclear warheads was necessary “to dissuade the emergence of potential or would-be peer competitors, by underscoring the futility of trying to ‘sprint toward parity’ with us or superiority.”³ As the nuclear power closest in numerical terms to the United States and Russia, China was clearly the primary adversary implicit in these remarks.

Although concerns about a surging China have somewhat receded with the arrival of the Obama administration, the negotiation and ratification of the New Strategic Arms Reduction Treaty (New START) between the United States and Russia seem to have revived unease over the potential of China’s nuclear capabilities. During the treaty’s negotiations, the “sprint to parity” issue and calls for China to be included in the process were reportedly raised.⁴ Although this criticism remained a minority viewpoint as the treaty’s terms were determined, the U.S. Senate’s reference in its resolution of advice and consent to ratification to “an expansion of the strategic arsenal of any country not party to New START so as to jeopardize the supreme interests of the United States” as a condition that could potentially warrant withdrawing from the treaty implies that there are domestic actors who are suspicious of China’s strategic intentions and how they might affect the United States’ advantage in the nuclear arena.⁵

1. James Acton, *Deterrence during Disarmament: Deep Nuclear Reductions and Nuclear Security*, Adelphi Paper 417 (Abingdon: Routledge for the International Institute for Strategic Studies, 2011), 89; Brad Roberts, “On Order, Stability, and Abolition,” in *Abolishing Nuclear Weapons: A Debate*, edited by George Perkovich and James Acton (Washington, D.C.: Carnegie Endowment for International Peace, 2009), 167; Ivan Oelrich, “Sizing Post-Cold War Nuclear Forces,” Institute for Defense Analyses, P-3650, October 2001, 36, 42; Christopher F. Chyba and J. D. Crouch, “Understanding the U.S. Nuclear Weapons Policy Debate,” *Washington Quarterly* 32 (July 2009): 22.

2. Chyba and Crouch, “Understanding the U.S. Nuclear Weapons Policy Debate,” 22.

3. Donald H. Rumsfeld, testimony before the Committee on Armed Services of the United States Senate on Ratification of the Moscow Treaty, Washington, July 25, 2002, 7, <http://armed-services.senate.gov/statemnt/2002/July/Rumsfeld.pdf>.

4. Gordon G. Chang, “START-ing without China,” *Wall Street Journal*, January 27, 2010, <http://online.wsj.com/article/SB10001424052748703906204575027821767691054.html>.

5. James Acton, *Low Numbers: A Practical Path to Deep Nuclear Reductions* (Washington, D.C.: Carnegie Endowment for International Peace, 2011), 51; *U.S. Senate Resolution of Advice*

Recent statements by members of Congress that call attention to the threat of a Chinese “sprint to parity” in order to highlight potential dangers inherent in further numerical reductions of U.S. deployed nuclear forces suggest that this issue may embolden domestic opposition to future rounds of nuclear arms control. For instance, in an April 2011 speech on Capitol Hill, Senator Jon Kyl (R-Ariz.) argued that “further nuclear disarmament would lead allied or hostile nations to ‘try to match’ the U.S. arsenal.”⁶ A few weeks later, Senator Jeff Sessions (R-Ala.) also expressed dismay about the opportunities for “rushing to achieve strategic parity” that a shrinking U.S. nuclear arsenal might provide and questioned the U.S. ability to “know with any certainty how many nuclear weapons the U.S. needs to maintain in order to disincentivize China to seek nuclear parity with the U.S.”⁷ Given the fierce opposition that New START encountered in the Senate before its ratification, these statements imply that uncertainty about Chinese nuclear forces could make securing congressional approval of future cuts a challenge.⁸

Anxieties about a Chinese “sprint to parity” may extend beyond the United States to its allies in Northeast Asia, particularly Japan. In June 2009, officials from the Japanese Defense Ministry purportedly relayed suspicion to U.S. colleagues that China was quickly modernizing its nuclear forces with the aim of achieving numerical equivalence with the United States and Russia.⁹ Recent research about the potential impact of deep reductions on international security confirms that this view is shared by several Japanese analysts, who all expressed concern that a smaller U.S. arsenal would motivate China to “sprint to parity.”¹⁰ It also has been reported that the prospect of a rapid Chinese nuclear buildup has prompted Japan to urge the United States to maintain a “powerful nuclear force” in order to dissuade China from growing more assertive in the local security environment.¹¹ Thus, for some allies, it appears that the possibility of a Chinese “sprint to parity” may increase the importance of their security relationships with the United States, and particularly of the extended deterrence guarantee that the United States provides with its nuclear forces.

The notion of a rapid Chinese buildup prompted by U.S.-Russian reductions is also a growing worry for Russia.¹² As a country already troubled by its neighbor’s expanding military power, the concept of a “sprint to parity” has purportedly “gained new life

and Consent to Ratification of New START Treaty, 111th Congress, 2nd session, para. (c)(7).

6. “Obama Nuclear Agenda Is ‘Loopy,’ Kyl Says,” *Global Security Newswire*, April 12, 2011, http://gsn.nti.org/siteservices/print_friendly.php?ID=nw_20110412_6334.

7. Rachel Oswald, “Further U.S. Nuclear Cuts Could Destabilize Global Strategic Order, Expert Warns” *Global Security Newswire*, May 9, 2011, http://www.globalsecuritynewswire.org/gsn/nw_20110509_8194.php.

8. Peter Baker, “Democrats Scramble to Save Votes to Ratify Nuclear Pact,” *New York Times*, December 19, 2010, <http://www.nytimes.com/2010/12/20/us/politics/20start.html>.

9. “China Rejects Curbs on Nuclear Arsenal Expansion,” *Global Security Newswire*, February 28, 2011, http://www.globalsecuritynewswire.org/gsn/nw_20110228_1719.php.

10. Acton, *Low Numbers*, 38.

11. “China Rejects Curbs.”

12. Roberts, “On Order, Stability, and Abolition,” 167.

as applied to Russia's China-related anxieties."¹³ It is commonly regarded by analysts that Russia relies on its nuclear weapons, particularly its tactical inventory, to address its conventional inferiority relative to the United States and NATO; it is increasingly plausible that Russia may also need its tactical nuclear forces to compensate for the disparity between Russian and Chinese conventional capabilities.¹⁴ Thus, rising concerns about the Chinese nuclear arsenal are likely to discourage Russian willingness to pursue deeper reductions, particularly those related to tactical nuclear weapons, an area that the Obama administration has expressed considerable interest in covering in a future arms control agreement.¹⁵

Given the numerical advantage in nuclear weapons capabilities that the United States and Russia currently maintain over China, the specter of a Chinese "sprint to parity" may not presently be an overwhelming concern; however, continued uncertainty about China's plans is likely to foster U.S. domestic, allied, and Russian anxieties about continued reductions of U.S.-Russian strategic forces. The future of China's nuclear forces may not have had a large influence on the terms of New START, but Chinese capabilities could be a focus in future arms control negotiations between the United States and Russia. Some experts have even suggested that without some form of assurance that China will not "sprint to parity," U.S.-Russian reductions may not continue.¹⁶ Thus, the strategic basis for China's current nuclear arsenal and ongoing modernization program—and its implications for the likelihood of a Chinese "sprint to parity"—may ultimately prove essential to laying the foundations for future arms control agreements.

China's Current Nuclear Forces

Understanding what is currently known (or rather, estimated) about the size and posture of the Chinese nuclear arsenal, as well as the approach to nuclear weapons that has determined these attributes, facilitates an appreciation for the effort that would be required for China to "sprint to parity." Although estimates vary, China is believed to possess roughly 175 active nuclear warheads, with an additional 65 warheads in reserve; a more specific breakdown of these weapons is given in table 1.¹⁷ Almost all the operationally deployed force is fielded on single-warhead, land-based missiles. The majority of this

13. Peter Lee, "China in the Catbird Seat on Iran," *Asia Times*, May 6, 2010, <http://www.atimes.com/atimes/China/LE06Ad01.html>.

14. Pavel Podvig, "Russia's Nuclear Forces: Between Disarmament and Modernization," *Proliferation Papers*, no. 37, Spring 2011, 22; Fu Lai and Liu Yupeng, "Russian Experts Clash over 'China Threat,'" *China.org.cn*, August 17, 2010, http://www.china.org.cn/opinion/2010-08/17/content_20728431.htm.

15. Nikita Perflyev, "Transparency with Chinese Characteristics," *PacNet*, Pacific Forum CSIS, no. 5 (January 24, 2011): 1.

16. Acton, *Deterrence*, 90–91, 95; Jeffrey Lewis, "NNSA's Harvey at New America," *Arms Control Wonk Blog*, June 15, 2007, <http://lewis.armscontrolwonk.com/archive/1544/nnsas-harvey-at-new-america>.

17. Robert S. Norris and Hans M. Kristensen, "Chinese Nuclear Forces, 2010," *Bulletin of the Atomic Scientists* 66 (November–December 2010): 134.

force is deployed on three kinds of intermediate-range missiles, which are primarily used for regional targeting. Two of three long-range missiles China possesses, the Dong Feng (DF)-5A and DF-31A, are capable of hitting the continental United States; thus, about 30 missiles can deliver warheads to intercontinental ranges. China’s sea-based nuclear forces are less robust. It is believed to have one operational Type 092 Xia-class nuclear-powered ballistic missile submarine (known as submersible ships–ballistic missile–nuclear powered, *or* SSBN), but this vessel does not patrol, and its missiles are not operational; the future of China’s next-generation SSBN program, as discussed below, is uncertain.¹⁸ China may also possess a modest inventory of nuclear weapons that are to be delivered by H-6 bombers, but their role in nuclear operations is believed to be minor.¹⁹ Furthermore, Chinese nuclear forces are not maintained at the same level of operational readiness as those deployed by the United States and Russia, which field a considerable fraction of their active forces on launch-ready alert. Contrastingly, China keeps its warheads in storage, demated from their delivery systems.

Table 1. Estimates of China’s Nuclear Forces

Type	Range* [km]	Fuel	Basing mode	Year deployed	Number	Number of Warheads
<i>Land-based ballistic missiles: intermediate range</i>						
DF-3A	3100	Liquid	Mobile	1971	~17-20	~17-20
DF-4	5400	Liquid	Mobile	1980	~17-35	~17-35
DF-21	2150	Solid	Mobile	1991	~50-60	~50-60
<i>Land-based ballistic missiles: long range</i>						
DF-5A	13000	Liquid	Silo	1981	~20	~20
DF-31	7200	Solid	Mobile	2006	~8-15	~8-15
DF-31A	11200	Solid	Mobile	2007	~13-15	~13-15
<i>Sea-based ballistic missiles**</i>						
JL-1	1000	Solid	<i>Xia</i> -class SSBN	1986	[1 x 12]	[1 x 12]
JL-2	7200	Liquid	<i>Jing</i> -class SSBN	~2012	[3 x 12]	[3 x 12]
<i>Aircraft</i>						
H-6	3100	-	-	1965	~20	~20
*All ranges are approximate.						
**Sea-based ballistic missiles are not believed to be operational at this time.						

Sources: Robert S. Norris and Hans M. Kristensen, “Chinese Nuclear Forces, 2010,” *Bulletin of the Atomic Scientists* 66 (November–December 2010): 139; Gregory Kulacki, “China’s Nuclear Arsenal: Status and Evolution,” *Union of Concerned Scientists*, May 2011, 2; Hans M. Kristensen, Robert S. Norris, and Matthew G. McKinzie, *Chinese Nuclear Forces and U.S. Nuclear War Planning* (Washington, D.C.: Federation of American Scientists and Natural Resources Defense Council, 2006), 61–77.

18. Gregory Kulacki, “China’s Nuclear Arsenal: Status and Evolution,” *Union of Concerned Scientists*, May 2011, 2; Norris and Kristensen, “Chinese Nuclear Forces,” 137.

19. Kulacki, “China’s Nuclear Arsenal,” 2; Norris and Kristensen, “Chinese Nuclear Forces,” 138.

The size and posture of this arsenal flows directly from China's fundamentally unique view of the role of nuclear weapons and, consequently, on what is required to deter their use. The Chinese government's official position is that the sole purpose of nuclear weapons is to deter a nuclear attack or nuclear aggression.²⁰ To fulfill this objective, China requires that a modest number of nuclear weapons must be able to survive a first strike; from the Chinese perspective, such a retaliatory force would be sufficient for imposing "unacceptable damage" on the aggressor. In other words, China bases its nuclear deterrent on a small, survivable second-strike capability.²¹ This is what Western analysts call a "minimum deterrent force."

How China determined the size and posture of a nuclear arsenal that could achieve minimum deterrence requirements is a topic of debate. Some experts argue that the explanation is ideational, crediting the beliefs of former leaders Mao Zedong and Deng Xiaoping on the development of Chinese nuclear strategy.²² Others have traced it to the "assured destruction" criterion for deterring a nuclear attack developed by U.S. secretary of defense Robert McNamara; according to this standard, the minimum number of warheads sufficient for inflicting "intolerable damage"—defined as 50 percent of Soviet industry and 20 to 25 percent of the Soviet population at the time—was reportedly "in the hundreds."²³ Another line of reasoning has inferred China's position on nuclear deterrence from the small size of China's strategic forces.²⁴

Regardless of its definitive origin, most China analysts and experts have concluded that China's minimum deterrence approach to nuclear weapons has resulted in the adequacy of a small arsenal of nuclear weapons to threaten the "lowest level of damage necessary to prevent attack."²⁵ Critically, minimum deterrence does not require numerical equivalence between the nuclear arsenals of potential adversaries; if a force meets the minimum deterrence criteria, it should be able to deter nuclear attacks by quantitatively and qualitatively superior nuclear arsenals. Thus, the minimum deterrence approach prioritizes the ability to inflict unacceptable damage over the ability to inflict equal damage. According to this view, minimum deterrence obviates the need for nuclear build-up or arms racing because they would be "costly, counterproductive, and ultimately self-

20. Li Bin, "China's Nuclear Disarmament Policy," in *The Nuclear Turning Point: A Blueprint for Deep Cuts and De-Alerting of Nuclear Weapons*, edited by Harold A. Feiveson (Washington, D.C.: Brookings Institution Press, 1999), 326–327.

21. "An Undersea Deterrent?" *Proceedings Magazine* (U.S. Naval Institute), no. 135/6/1276 (June 2009), <http://www.usni.org/magazines/proceedings/2009-06/undersea-deterrent>.

22. M. Taylor Fravel and Evan S. Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure," *International Security* 35 (Fall 2010): 51.

23. Li Bin, "Paper Tiger with Whitened Teeth," *China Security* 2 (Autumn 2006): 86; Li, "China's Nuclear Disarmament Policy," 327; Feiveson, *Nuclear Turning Point*, 52.

24. Jeffrey G. Lewis, *The Minimum Means of Reprisal: China's Search for Security in the Nuclear Age* (Cambridge, Mass.: American Academy of Arts and Sciences, 2007).

25. Fravel and Medeiros, "China's Search," 50.

defeating.”²⁶ China seems to have assessed that a small force fulfilling minimum deterrence requirements is adequate and will continue to be endorsed more or less irrespective of the magnitude of U.S. and Russian nuclear capabilities.²⁷

The Nuclear Modernization Program

The quantitative and qualitative advantages in nuclear capabilities currently maintained by the United States and Russia over China have at least partially assuaged concerns about China’s strategic forces for the time being. Thus, the prospect of a Chinese “sprint to parity” seems to hinge on the range of improvements that China has been gradually making to its nuclear forces during the past several years. Although the exact scope of these efforts is questionable, defense experts have consistently highlighted a number of trends. The scope and strength of these efforts could likely be key enablers of a potential “sprint to parity.”

Upgrades to China’s land-based nuclear forces have focused on gradual replacement of the liquid-fueled ballistic missiles it designed in the 1960s and 1970s with solid-fueled missiles. These changes will decrease the time required to launch the missiles and make them safer to handle. China has also devoted resources to increasing the mobility of these missiles, a characteristic essential to improving the survivability of strategic forces.²⁸ The development of the intercontinental ballistic missile (ICBM) on which the upgrade plan centers—the DF-31 and its land-based derivative, the DF-31A—has been lengthy: it began in the mid-1980s and so far only about 20 of these systems have been deployed.²⁹ Whether China intends to retire the DF-5A—the long-range, silo-based missile it historically has used to target the United States and Russia—or keep it operational is uncertain.³⁰ The land-based ICBM force may also be affected by a further, as-yet-undetermined development; in its annual report to Congress on Chinese military power, the U.S. Department of Defense voiced speculation that “China may also be developing a new road-mobile ICBM, possibly capable of carrying multiple independently targeted re-entry vehicles.”³¹

China is also producing a solid-fueled, mobile, intermediate-range ballistic missile, the DF-21. First fielded in 1991, the DF-21 has been manufactured in small batches and modified to undertake conventional missions.³² Increases in the Department of Defense’s estimates of China’s nuclear-capable delivery vehicles over the past five years have in

26. Ibid., 87.

27. Oelrich, “Sizing Post–Cold War Nuclear Forces,” 43.

28. Fravel and Medeiros, “China’s Search,” 82.

29. Jeffrey Lewis, “The Ambiguous Arsenal,” *Bulletin of the Atomic Scientists*, May–June 2005, 52–59, at 56; Kulacki, “China’s Nuclear Arsenal,” 4.

30. Norris and Kristensen, “Chinese Nuclear Forces,” 135.

31. U.S. Department of Defense, *Military and Security Developments Involving the People’s Republic of China 2010* (Washington, D.C.: Office of the Secretary of Defense, 2010), 2.

32. Kulacki, “China’s Nuclear Arsenal,” 4.

part come from greater numbers of DF-21s.³³ It is believed that this missile will take over the primary regional deterrent role from the older DF-4s.³⁴

The sea-based leg of China's nuclear forces is undergoing substantial improvements, albeit slowly. China is currently developing its next-generation SSBN fleet, the Type 094 Jin class. At least two vessels have been built, and it is anticipated that up to three more may be produced; Chinese analysts have stated that plans for the Jin class may be based on the French and British nuclear submarine forces, each of which has four ships.³⁵ The Jin-class SSBNs will reportedly be armed with 12 Ju Lang (JL)-2 nuclear-capable submarine-launched ballistic missiles (SLBMs), a penetration aid-outfitted missile with an approximate range of 7,200 kilometers.³⁶ The JL-2, which has been in development since the 1980s, has encountered technical difficulties in its initial flight tests; thus, it is unknown when the new class of SSBNs will become operational.³⁷

There are also some questions regarding the survivability (and thus utility) of these JL-2 vessels once they are deployed. First, the missile is not capable of hitting the continental United States from the territorial waters where general-purpose forces could protect SSBNs. Second, the Jin class is reportedly very noisy, according to the Office of Naval Intelligence, which raises concerns about the probability of detection on patrol, particularly in the open ocean where the ships would need to operate in order to be in range of the United States.³⁸ Third, Chinese submarines have never conducted a patrol, casting doubt on the quality of the training that SSBN crew members have been given.³⁹ Finally, how the Chinese, who historically have exercised strict control over their nuclear forces, will manage the difficult command and control challenges associated with SSBN operations is unclear.⁴⁰

Despite the slow pace of China's nuclear modernization efforts, concern on the part of the United States, its allies, and Russia about China's nuclear weapons potential is not entirely unwarranted, as the lack of details about China's plans to update its nuclear deterrent may cause conservative military planners to assume the worst. Although the United States has tried to reduce its concerns by requesting more specific information about the pace and scope of China's nuclear upgrades, these efforts have not been successful. The dismissal of such queries can be attributed in large part to the long-standing Chinese view on transparency in nuclear weapons arsenals. In contrast to a core tenet of U.S.-Russian arms control—that transparency promotes predictability, which in turn

33. Norris and Kristensen, "Chinese Nuclear Forces," 135.

34. *Ibid.*, 136.

35. "Undersea Deterrent?"

36. Norris and Kristensen, "Chinese Nuclear Forces," 137; "Undersea Deterrent?"

37. Kulacki, "China's Nuclear Arsenal," 2; John Pomfret, "Military Strength Eludes China, Which Looks Overseas for Arms," *Washington Post*, December 25, 2010, http://www.washingtonpost.com/wp-dyn/content/article/2010/12/24/AR2010122402788_pf.html; U.S. Department of Defense, *Military and Security Development*, 34.

38. Pomfret, "Military Strength Eludes China."

39. "Undersea Deterrent?"; Norris and Kristensen, "Chinese Nuclear Forces," 137.

40. "Undersea Deterrent?"

establishes stability—Chinese nuclear policymakers believe that foreign military coercion predicated on the threat to use nuclear weapons is much less likely if the adversary questions its capacity to implement a disarming first strike.⁴¹ China believes it can instill doubt into the calculations of potential aggressors and augment the deterrent effect of its strategic forces by maintaining secrecy regarding its nuclear weapons. Thus, opacity in Chinese nuclear forces should be viewed less as a deliberate duplicitous mechanism through which China hopes to conceal ambitious facets of its modernization plans, and more as a way to enhance the deterrent threat posed by its relatively small nuclear arsenal.

Chinese government officials have attempted to downplay concerns about its ongoing nuclear upgrades by describing them as organic augmentations of China's strategic forces. Retired People's Liberation Army major general Xu Guangyu recently justified the modernization program in the nation's primary military newspaper as a way to maintain the "real, reliable, effective" elements of China's nuclear arsenal in a manner that "keeps up with the times."⁴² Typically, these statements underscore that the principal rationale for the modernization program is to preserve China's minimum deterrent capability in the form of assured second-strike forces. General Xu wrote, for example, that improving Chinese nuclear forces will be able "to convince the other sides that it faces an intolerable second-strike nuclear capability, thereby deterring an enemy from using nuclear weapons against us."⁴³

The primary drivers of the pace and scope of the Chinese nuclear modernization program are, experts argue, driven primarily by U.S. military advances that could substantially degrade Chinese ability to launch a credible second strike.⁴⁴ In particular, capabilities like ballistic missile defenses and conventional strategic strike are perceived to threaten China's retaliatory capacity if it were to come under nuclear attack, potentially increasing its vulnerability to foreign military coercion.

Most recently, these views were apparent in the Chinese reaction to the 2010 *Nuclear Posture Review (NPR) Report*.⁴⁵ Defense experts who have examined the Chinese response to the *NPR* have generally concluded that it was relatively positive, due in part to elements of the report like the narrowing of circumstances that warrant potential use of U.S. nuclear weapons as well as the first official embrace of a world free of nuclear weapons in U.S. policy. However, many in China articulated their concern about the

41. Perfil'yev, "Transparency," 1; Kulacki, "China's Nuclear Arsenal," 3.

42. Chris Buckley, "China Military Paper Spells Out Nuclear Arms Stance," Reuters, April 22, 2010, <http://www.reuters.com/article/2010/04/22/us-china-military-nuclear-idUSTRE63L0PR20100422>.

43. Ibid.; Lewis, *Minimum Means*, 154.

44. Fravel and Medeiros, "China's Search," 81, 86; Teng Jianqun, "Choices and Challenges for China's Nuclear Disarmament Policy," *China Security* 6 (2010): 53; Bobo Lo, "Russia, China, and the United States: From Strategic Triangularism to the Post-Modern Triangle," *Proliferation Papers*, no. 32 (Winter 2010), 29.

45. U.S. Department of Defense, *Nuclear Posture Review Report* (Washington, D.C.: Office of the Secretary of Defense, 2010).

significance attached to the continued development of ballistic missiles defenses and conventional strategic strike in the report.⁴⁶

Chinese worries about U.S. ballistic missile defenses appear to stem from their lack of confidence—given the significantly smaller size of Chinese strategic forces relative to those of the United States and Russia—in the ability of a Chinese second strike to penetrate such a defensive system, particularly if that system is considerably expanded. This scenario is not an incredible force exchange to envision. Indeed, it is often posited that if the United States were able to launch a first strike that eliminated most of China’s ballistic missile forces, strategic defenses could conceivably “mop up” any remaining missiles that might be used in retaliation.⁴⁷ In order to safeguard its second-strike capability against the long-term potential of such defenses, China’s nuclear modernization has emphasized the enhancement of mobility and survivability through the development of improved road-mobile missiles and next-generation SSBNs. In an article published last year, General Xu stressed that “international experience shows the most effective second-strike capability is submarines . . . that and the upgraded missiles are a focus.”⁴⁸ China has also ascribed importance to advancements in the types of technologies that could augment China’s abilities to evade missile defenses, like penetration aids and decoys.

The overall reaction by Chinese experts to the *NPR* suggests that the concern with the development of advanced conventional weaponry like Conventional Prompt Global Strike relates not only to their standalone military effectiveness and ability to hold at risk targets that were previously covered by nuclear weapons but also to their implications for further U.S. nuclear reductions.⁴⁹ The view of Chinese analysts seems to imply that numerical reductions in strategic nuclear forces that take place concurrently with advances in arenas like conventional strategic strike “have the potential to negate one another in a cost/benefit analysis.”⁵⁰ Consequently, the cuts mandated by New START are not likely to diminish China’s security concerns about U.S. strategic forces.⁵¹ The replacement of nuclear weapons with advanced conventional strike is also viewed by China as a mechanism through which the United States can maintain its ability to project force into the region.⁵²

In sum, the pace of China’s nuclear modernization program thus far appears more consistent with ensuring a credible second-strike capability than with laying the foun-

46. Thomas Fingar, “Worrying about Washington,” *Nonproliferation Review* 18 (2011): 58; Lora Saalman, *China and the U.S. Nuclear Posture Review* (Washington, D.C.: Carnegie Endowment for International Peace, 2011), 13, 15-16, 22-26.

47. Acton, *Deterrence*, 47.

48. Buckley, “China Military Paper Spells Out Nuclear Arms Stance.”

49. Fingar, “Worrying about Washington,” 59.

50. Saalman, *China and the U.S. Nuclear Posture Review*, 13.

51. *Ibid.*, 15-16.

52. Lo, “Russia, China, and the United States,” 29; Saalman, *China and the U.S. Nuclear Posture Review*, 22; “China Reaffirms ‘No First Use’ Deterrent Policy,” *Global Security Newswire*, March 31, 2011, http://gsn.nti.org/siteservices/print_friendly.php?ID=nw_20110331_5221.

dations to race to numerical parity. Perhaps more important, accepting the claim that China will be prompted to build up its nuclear arsenal once the size of U.S. and Russian strategic forces fall below a certain threshold implies a rather sudden Chinese emphasis on absolute differences between the nuclear arsenals of potential adversaries. Given China's rationale for maintaining and upgrading the modest arsenal it possesses, mathematical parity seems to matter little to China in comparison with the emphasis placed on maintaining credible second-strike forces. Chinese reactions to the fixation of some U.S. analysts and policymakers on the opportunity for a "sprint to parity" offered by U.S.-Russian nuclear arsenal reductions highlight this point. To many Chinese experts, an expansion of their country's nuclear forces is more likely to result from the "unswerving pursuit of deterrence substitutes" that they believe the United States is demonstrating through advances in conventional strategic strike capabilities than from the absolute nuclear balance.⁵³ If anything, "nuclear perpetuation" is based more on the future deployments of U.S. ballistic missile defenses and nonnuclear strike systems than quantitative adjustments of U.S. and Russian nuclear forces.⁵⁴

Greater Ambitions?

The presumption that China will "sprint to parity" with the United States and Russia, if the two countries negotiate arms control agreements that further reduce the size of their strategic forces, seems to be contradicted by the publicly estimated technical and strategic details surrounding China's current nuclear forces and ongoing modernization program. China's nuclear force upgrades appear to emphasize qualitative improvements to ensure a credible second-strike capability rather than quantitative increases in warhead numbers.

Furthermore, the United States and Russia have been engaged in bilateral nuclear reductions for decades, during which time China has likely controlled the financial and technological resources to subsidize an ambitious numerical buildup; yet its nuclear arsenal has not expanded beyond a minimum deterrent capability of a few hundred warheads. China has seemed to refrain from a number of efforts that would have enabled it to pursue more ambitious nuclear weapons capabilities if its leadership had strongly desired numerical parity—increased procurement of nuclear-capable ballistic missiles, development of multiple independently targetable reentry vehicle (MIRVed) missiles, and further production of fissile material.

The high rates of economic growth and defense spending in China in the 1960s, 1970s, and 1990s likely could have enabled a sizable Chinese nuclear weapons expansion; yet, throughout the decades, China has taken a gradual approach to the development of its nuclear capabilities.⁵⁵ China has historically taken longer periods of time to develop, test, and deploy new nuclear weapons systems than the United States or Russia have on similar programs. Even after a system has been certified for deploy-

53. Saalman, *China and the U.S. Nuclear Posture Review*, 26.

54. *Ibid.*, 28.

55. Fravel and Medeiros, "China's Search," 73–75.

ment, the pace of subsequent production and fielding of that system has been notably slow; technical experts attribute this to Chinese nuclear weapons procurement practices, which are characterized by small-batch manufacturing and modest, steady modification programs.⁵⁶ For example, it is believed that China is still introducing modifications to its DF-4 and DF-5A ballistic missiles, whose systems are based on designs dating back to the 1960s.⁵⁷

The extent to which the length of this process is due to technical difficulties encountered during the development process is unclear; however, it seems unlikely that China's manufacturing base is the issue. After all, the modest pace of China's nuclear-capable ballistic missile upgrade program is at variance with the speed of conventionally equipped short-range and medium-range ballistic missile (SRBM and MRBM) production in recent years.⁵⁸ The Department of Defense reports that the rocket motor manufacturing and final assembly facilities associated with these missile classes has resulted in the capacity for "surge production."⁵⁹ This situation has likely contributed to growth in China's nonnuclear SRBM and MRBM forces since the 1990s, which have swelled from a few hundred to an estimated 1,500 today.⁶⁰ This comparison implies that the slow pace of China's long-range delivery vehicle expansion could conceivably be interpreted as a deliberate decision on behalf of the Chinese leadership.

Although China is not currently believed to deploy MIRVed missiles, this lack of information does not necessarily imply that it does not possess the ability to place multiple warheads on its missiles. There are two essential capabilities that must be considered: China's ability to miniaturize reliable nuclear warhead designs so that multiple devices can be mounted on top of one or more of its strategic delivery vehicles, and the ability of Chinese delivery vehicles to carry and detonate multiple nuclear warheads at their designated targets.

Before signing the Comprehensive Test Ban Treaty (CTBT) in 1996, China completed a series of tests on its smallest warhead. The warhead was reportedly slated to arm the DF-31, a long-range missile also undergoing development at the time. According to estimates by the National Air and Space Intelligence Center, the lighter-weight reentry vehicle that was the focus of the final test series had a mass of 470 kilograms. Although this is likely to exceed the payload capacity for China's newer, solid-fueled ICBMs like the DF-31 and DF-31A, fielding this warhead would not necessarily require the development of a new missile or the testing of a new warhead (which would now receive harsh criticism given China's signature on the CTBT).⁶¹ Because the DF-5A can carry a substantially larger payload than the DF-31 and DF-31A, as inferred from the comparatively

56. Norris and Kristensen, "Chinese Nuclear Forces"; Kulacki, "China's Nuclear Arsenal," 4.

57. Kulacki, "China's Nuclear Arsenal," 4.

58. Fravel and Medeiros, "China's Search," 82; U.S. Department of Defense, *Military and Security Developments*, 44.

59. U.S. Department of Defense, *Military and Security Developments*, 44.

60. Fravel and Medeiros, "China's Search," 82.

61. Lewis, "Ambiguous Arsenal," 57; Kulacki reports that the maximum deliverable payload of DF-31 and DF-31A is approximately 500 kilograms; Kulacki, "China's Nuclear Arsenal," 5.

higher yield of the warheads it reportedly carries, there is a possibility that this older, liquid-fueled missile could carry multiple warheads based on the last design China tested. If U.S. suspicions that China is developing a new road-mobile, MIRV-capable ICBM prove correct, this delivery system could potentially offer another option for deploying the lighter-weight reentry vehicle tested by China in the mid-1990s.

Chinese media sources have purportedly described flight tests in the last few years of China's older, liquid-fueled missiles, the DF-4 and DF-5A, that include more than one reentry vehicle along with penetration aids designed to counter ballistic missile defenses.⁶² These reports suggest that China may be testing the capacity of its delivery vehicles—one type of which is normally used to target the United States and Russia—to carry and detonate multiple nuclear warheads at their designated targets.

China has also not manufactured enough fissile material for a more ambitious nuclear weapons force, despite its resources for doing so. It purportedly halted fissile material production in 1990. Recent estimates that take into account the operating history of its military uranium enrichment and plutonium production facilities, along with the material consumed in nuclear weapons tests, conclude that China's current stockpiles total approximately 12 to 20 tons of highly enriched uranium (HEU) and 1.3 to 2.3 tons of weapons-grade plutonium (Pu).⁶³ Assuming that China uses a traditional two-stage nuclear warhead design involving Pu primary and HEU secondary components, back-of-the-envelope calculations suggest that this stockpile likely suffices for about 300 to 500 additional nuclear warheads.⁶⁴ Because much of this material is probably used to hedge against unforeseen technological failures in warhead designs, these stocks do not give China considerable quantities of surplus material beyond that which would be needed to replace its 240-strong active warhead stockpile. What is more, a recent analysis of China's warhead handling and storage system found no clear evidence that its nuclear warhead stockpile was expanding; thus, if China does want to build a larger arsenal, it would probably require more than its current stocks of fissile material.⁶⁵

An (albeit cursory) review of the financial and technological resources that China has had at its disposal suggests that a nuclear buildup would have been within its means at several points in the past. That its nuclear arsenal did not expand beyond a force of a few hundred warheads implies that its leadership felt a smaller force was sufficient to meet its national security requirements. Moreover, because the United States and Russia have been reducing their numerical advantage in nuclear weapons over China for decades, in accordance with bilateral arms control agreements, it is possible that the "bar

62. Kulacki, "China's Nuclear Arsenal," 2.

63. International Panel on Fissile Materials, *Global Fissile Material Report 2010* (Princeton, N.J.: Program on Science and Global Security, 2010), 98; China's HEU is believed to contain 90 percent uranium-235, and its weapons-grade Pu is believed to contain 94 percent Pu-239; *ibid.*, 185.

64. These calculations assume that a conservative design of a two-stage, medium-yield weapon would require 25 kilograms of HEU and 4 kilograms of weapons-grade Pu.

65. Mark A. Stokes, "China's Nuclear Warhead Storage and Handling System," Project 2049 Institute, March 2010, 12.

has been lowered” for achieving mathematical equivalence for longer than is typically thought. China’s lack of interest in exploiting these opportunities suggests that numerical parity with U.S. and Russian nuclear arsenals is not something sought in the near or long term.

Implications and Recommendations for U.S. Policy

Although the review of Chinese strategic forces given in this paper suggests that the prospect of a Chinese “sprint to parity” may be improbable, the combination of continued uncertainty regarding China’s plans to upgrade its nuclear forces with a decreasing U.S.-Russian numerical advantage over China is likely to encourage worst-case assumptions regarding China’s intentions and capabilities. Accordingly, there may be a few steps that the United States could take to foster a better understanding of evolving Chinese strategic forces, safeguard U.S. interests, and possibly prevent this issue from having a significant impact on the feasibility of further reductions in U.S. and Russian nuclear arsenals.

Monitor Potential Leading Indicators

Current details about China’s nuclear modernization program do not imply that an ambitious nuclear buildup is taking place; however, a few potentially observable leading indicators might suggest that China could be shifting away from a policy of credible minimum deterrence and toward one that would require a set of strategic forces that could more closely rival the capabilities of the United States and Russia. Monitoring these facets of China’s nuclear forces would require substantial surveillance but would provide conservative military planners with some warning that China’s nuclear upgrades might be aimed at achieving more than moderate qualitative improvements in the survivability of China’s nuclear deterrent.

One indicator might be the resumption of operations at China’s military uranium enrichment and Pu production facilities. As noted above, China’s stockpiles of HEU and weapons-grade Pu are estimated to constitute sufficient fissile material for roughly 300 to 500 two-stage, medium-yield nuclear warheads. However, most of this material is likely retained to hedge against the possibility of unanticipated systemic faults in deployed Chinese warheads; if technical failure eliminated the effectiveness of an entire class of warheads, China could use these fissile material stocks to fashion replacements for the associated delivery vehicles. To meet the needs of a larger ballistic missile arsenal, China will likely need to restart its military uranium enrichment and plutonium production facilities so that it can concurrently equip an augmented ballistic missile inventory with nuclear warheads and continue to safeguard its strategic forces against unforeseen technological failure.

Another signal that China may want to enable an increase in the size of its strategic forces would be further development of MIRVed delivery vehicles that are capable of carrying more than a single warhead. In addition to increasing the target coverage for a given missile, MIRVed missiles can increase the chance of penetrating ballistic missile

defenses because they increase the number of warheads that missile defense interceptors must target. The appearance of this capability seems to hinge on the future evolution of two Chinese systems. The first is the DF-5A, China's long-range, silo-based missile that has historically been used to hold targets in the United States and Russia at risk. Because the maximum deliverable payload capacity of this system is estimated to be around 3,000 kilograms, it could probably deliver several smaller warheads to intercontinental ranges.⁶⁶ China may also have tested this missile with multiple dummy warheads and penetration aids.⁶⁷ The second, potentially MIRV-able system is the new road-mobile ICBM that may currently be under development. This delivery vehicle is rumored to carry more than 10 warheads.⁶⁸

A third indication of important shifts in Chinese nuclear weapons policy could be research and development work for early warning capabilities. Early warning systems are designed primarily to detect incoming missiles before they reach their targets; identifying an incoming strike early can permit sound assessment of the source and scale of the attack, which in turn should determine the appropriate level of response.⁶⁹ Such systems also enable "launch under attack" alert configurations, which can increase the likelihood that a country could implement a retaliatory strike against an aggressor before the impact of the first attack. China does not currently possess such a system; the warning time given to countries that deploy such capabilities would presumably be inadequate for Chinese decisionmakers because nuclear delivery vehicles are kept demated from their respective warheads (under peacetime conditions, at least). As long as China lacks an early warning capability, a nuclear arsenal that rivals that size of the United States and Russia would be somewhat senseless because Chinese decisionmakers and military planners would be unable to detect an incoming first strike. Consequently, early warning systems could be viewed as a "sprint to parity."

A related type of force development that might signal a changing Chinese approach to nuclear weapons would be modifications of China's alert posture. As mentioned above, Chinese nuclear warheads are believed to be stored separately from their delivery systems, obscuring the time frame in which China could launch a retaliatory strike against an aggressor who attacks with nuclear weapons. A change in this policy that decreases the length of time it would take for China to load its nuclear warheads on their associated delivery vehicles in preparation for a counterattack would demonstrate China's willingness to increase the operational readiness of its strategic forces. If complemented by an early warning system, such an employment policy shift would also increase the survivability of China's nuclear forces, for they could be launched more quickly in the event of an attack. Consequently, this type of policy modification might imply that China is aiming to achieve a nuclear arsenal more capable of assuring that it could impose unacceptable damage on an attacker.

66. Kulacki, "China's Nuclear Arsenal," 1.

67. *Ibid.*, 2.

68. Chang, "START-ing."

69. Pavel Podvig, "History and the Current Status of the Russian Early Warning System," *Science and Global Security* 10 (2002): 22.

Finally, official statements by members of the Chinese government that suggest growing divergence from positions on exercising restraint and arms racing—stances which have remained relatively consistent for the past 50 years—would also likely be a useful leading indicator. Many Chinese experts question whether the Obama administration will be able to deliver on the rhetoric contained in the *NPR*;⁷⁰ this is only one example of the importance that China ascribes to matching words with deeds. A “sprint to parity” could likely be manifested first in declaratory policy.

Maintaining a Robust Stockpile of Nuclear Warheads

One way in which the United States arguably negates the perceived advantages of a prospective Chinese “sprint to parity” is through its stockpile of nondeployed nuclear warheads—often referred to as the reserve force. In addition to acting as a hedge against the possibility of a technical failure of a warhead type, this stockpile, comprising a couple thousand warheads, also safeguards U.S. nuclear forces against “geopolitical reversals” that would require the additional deployment of U.S. nuclear warheads.⁷¹ Ensuring the long-term safety, security, and reliability of the reserve force preserves the U.S. ability to reconstitute elements of its strategic forces, if necessary, through “uploading” non-deployed warheads back onto delivery vehicles. A robust stockpile could impress upon potential peer competitors like China that any advantages perceived to accompany the deployment of augmented capabilities would be fleeting. It would also enable the United States to respond to the preliminary “sprint to parity” warning signals outlined above, or to similar variants, in a timely and efficient manner. In the 2010 *NPR*, the Obama administration directed the U.S. government to devote considerable resources to sustaining the stockpile through continued life extension programs and the refurbishment of the critical infrastructure to support such programs.⁷² Congress has appeared to endorse the idea with its provision of funding for the Uranium Processing Facility at the Y-12 National Security Complex and the Chemistry and Metallurgy Research Replacement-Nuclear Facility at Los Alamos National Laboratory.

Building Deeper Confidence in the U.S.-Sino Nuclear Deterrent Relationship

Finally, some of the concern regarding a Chinese “sprint to parity” might be driven by a lack of common understanding about the U.S.-Sino deterrent relationship as the numerical advantage of U.S. nuclear forces over the Chinese nuclear arsenal decreases. The 2010 *NPR* called for “maintaining a stable strategic relationship” with China.⁷³ Yet ex-

70. Saalman, *China and the U.S. Nuclear Posture Review*, 9.

71. Robert S. Norris and Hans M. Kristensen, “U.S. Nuclear Forces,” *Bulletin of the Atomic Scientists* 66 (May–June 2010): 57; Jay Solomon, “U.S. Declares Size of Nuclear Arsenal,” *Wall Street Journal*, May 4, 2010, <http://online.wsj.com/article/SB10001424052748704342604575222121497753864.html>; U.S. Department of Defense, *Nuclear Matters Handbook* (Washington, D.C.: Office of the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs, 2011), 37.

72. U.S. Department of Defense, *Nuclear Posture Review Report*, 37–43.

73. *Ibid.*, 6.

perts who have examined China's parsing of the *NPR* have concluded that many Chinese experts are unsure if and how the concept of "strategic stability" applies to the U.S.-Sino relationship, and what the implications of such a relationship might be for U.S. military capabilities.⁷⁴ Relations based on strategic stability that imply a deterrent relationship premised on the notion of "mutual vulnerability" seem to represent a palatable opportunity from the Chinese perspective; however, such a relationship would require the United States to limit military capabilities like ballistic missile defenses and advanced conventional strike.⁷⁵ So far, the United States has refused to acknowledge this type of deterrent relationship with China, which has led some Chinese experts to conclude that the U.S. conception of strategic stability is equivalent to China's acceptance of "U.S. hegemony" and "force projection capabilities and policies."⁷⁶

Without a more clearly defined nuclear deterrent relationship, opportunities for signal misinterpretation increase. For example, because the United States has declined to recognize a mutually vulnerable relationship with China, this may be perceived by the Chinese as an indication that the United States will develop capabilities like advanced conventional strike and ballistic missile defenses—technologies that the Chinese believe threaten the viability of their deterrent—free from restraint, in turn providing a justification for Chinese programs like the nuclear modernization effort. Conversely, the United States' application of historically U.S.-Russian-specific concepts like strategic stability to the U.S.-Sino deterrent relationship is problematic because the lack of transparency on the Chinese side is likely to foster a sense of unpredictability and therefore instability, prompting worst-case assumptions like the "sprint to parity" scenario.

Moreover, U.S.-Sino engagement in confidence-building measures (CBMs) could enable both parties to improve their understanding of each country's reliance on its strategic capabilities and thus help to decrease the chances for potentially destabilizing signal misapprehension.⁷⁷ CBMs that focus on aspects of U.S. forces that China finds worrisome (e.g., ballistic missile defenses and advanced conventional weaponry) and on disconcerting facets of Chinese nuclear capabilities from the U.S. perspective (the pace of its nuclear modernization program) may particularly help to reduce mistrust between the two countries. Such measures will likely require more than theoretical discussions to assuage concerns and will need to be perceived as yielding equitable benefits for each side. They could focus on bringing together U.S. and Chinese technical experts or members of the military.⁷⁸ Substantively, one possible approach might be to initialize a CBM based on data exchanges regarding specific attributes and capabilities of systems that each country would like clarified. Sharing such information could potentially give the United States and China better means to ground their threat assessments on authentic data rather than worst-case assumptions. A more intrusive set of CBMs could involve

74. Saalman, *China and the U.S. Nuclear Posture Review*, 7.

75. *Ibid.*, 8, 10, 14.

76. *Ibid.*, 7.

77. Linton F. Brooks, "Looking to the Future: The Post–New START World and Potential Sino-U.S. Confidence-Building Measures," forthcoming.

78. *Ibid.*

invitations to observe military exercises or operational procedures.⁷⁹ All these measures could facilitate a more comprehensive understanding of how particular capabilities fit into both U.S. and Chinese approaches to nuclear deterrence. As the margin between the size of U.S. and Chinese nuclear forces shrinks, such clarifications will become increasingly important.

Conclusion

The paucity of convincing technical, strategic, and historical evidence for the prospect of a Chinese “sprint to parity” implies that this notion should be invoked with caution, particularly by policymakers involved in decisions related to nuclear arms control. It overstates the scope of the Chinese nuclear modernization program, which is likely aimed at introducing moderate, qualitative changes in order to ensure a modest and credible second-strike capability. It also presupposes a Chinese emphasis on absolute differences between the nuclear arsenals of potential adversaries, which—given China’s fundamentally unique position that the role of nuclear weapons is solely to deter a nuclear attack, and that a small arsenal of nuclear weapons is sufficient to threaten unacceptable damage—seems inappropriate. Looking ahead, if a lack of insight into Chinese capabilities becomes an acute obstacle for deeper U.S.-Russian nuclear reductions, U.S. interests would seem to be better served now by activities that may eventually enhance the United States’ understanding of China’s intentions, rather than assuming an unproven concept today that could likely decrease the chances for reaching such an understanding in the future.

79. Ibid.

The Rarotonga and Pelindaba Treaties: Advancing U.S. Nonproliferation Goals Globally

Grant Schneider

On May 3, 2010, at the opening of the Nuclear Non-Proliferation Treaty (NPT) Review Conference in New York, Secretary of State Hillary Rodham Clinton announced that the United States would submit the protocols of the South Pacific Nuclear-Free-Zone Treaty (Treaty of Rarotonga) and the African Nuclear-Weapon-Free-Zone Treaty (Pelindaba Treaty) to the United States Senate for ratification. This announcement, coupled with other initiatives brought forth by the United States, was instrumental in the success of the 2010 NPT Review Conference. The United States selectively signed the protocols of both treaties in 1996 but failed to ratify them. These two treaties, to paraphrase, collectively fore swear the research, development, manufacture, stockpiling, acquisition, possession, or control over any nuclear explosive device by any means. Along with their counterparts in Latin America, Central Asia, and Southeast Asia, these two treaties are success stories of the nonproliferation regime in the midst of fears about Iran, North Korea, and other proliferators. As with other nuclear-weapons-free-zone treaties, these treaties call on the five nuclear powers under the NPT to ratify the protocols governing nuclear material and infrastructure in their respective zones. Both treaties include substantial and important negative security assurances from the nuclear weapon states to states that are party to the zones. This paper outlines the numerous arguments for ratification as well as the benefits the United States stands to reap in the event of ratification. The paper discusses the benefits of ratification in four key areas: strengthening international safeguards, benefits to the NPT, the positive impact on the “hard cases,” and reducing the salience of nuclear weapons. Because there is little understanding and interest in nuclear weapon-free zones in the U.S. Congress, it is my hope that this paper will provide a succinct and informative resource for those involved in the Senate advice and consent process when debate begins.

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The Context

On May 2, 2011—one year after Secretary of State Hillary Clinton’s speech at the opening of the 2010 Nuclear Non-Proliferation Treaty Review Conference, announcing that the United States would submit the protocols of the South Pacific Nuclear-Free-Zone Treaty (Treaty of Rarotonga) and the African Nuclear-Weapon-Free-Zone Treaty (Pelindaba Treaty) to the U.S. Senate for ratification—the Obama administration announced the submission of the protocols of these two treaties for advice and consent of the U.S. Senate.¹ The treaty protocols, which were signed by President Bill Clinton in 1996, are an important tool in reducing the threats posed by nuclear weapons and proliferation. The protocols’ ratification is part of the administration’s efforts to achieve the second objective of its own 2010 *Nuclear Posture Review Report*: reducing the role of nuclear weapons in U.S. national security.²

The protocols will not require changes in U.S. law and do not run counter to current declaratory policy. Most fundamentally, the protocols applicable to the nuclear weapon states (NWSs) strengthen U.S. and global nonproliferation efforts by crosshatching existing efforts and institutions to ensure the success of the nuclear nonproliferation regime. The ratification of the protocols does so by recognizing the important efforts of non-nuclear weapon states in reducing the dangers of nuclear weapons. Currently, the United States is the only NWS yet to ratify the Pelindaba protocols. In the case of the Rarotonga Treaty, there is a less uniform ratification progress among the other NWSs. This paper discusses how the ratification of these protocols will advance efforts to limit nuclear proliferation globally.

Pelindaba and Rarotonga, along with their counterparts in Southeast Asia, Central Asia and Latin America, represent successes of the nonproliferation regime. Notably, the nuclear-weapons-free zones are homegrown efforts and contribute to and help sustain the nonproliferation regime. Pelindaba and Rarotonga are no exception. Both treaties were born out of the scars of nuclear testing and, in the case of the African zone, South Africa’s successful effort to build a small nuclear arsenal. Unlike many aspects of the nonproliferation regime that are coercive and/or initiated by NWSs, these treaties demonstrate that the states that are party to them recognize that regional nuclear disarmament is in their national security interest. Although the United States and other NWSs were involved and consulted during the writing and negotiation of the treaties, the impetus for creating the zones came from the respective regions. The impetus came not only from past experiences in their respective regions with the effects of nuclear weapons testing but also from their rejection of the nuclear arms race that occurred during the Cold War between the United States and Russia.

1. For Clinton’s speech, see “Secretary Clinton’s Remarks at NPT Review Conference,” May 3, 2011, <http://www.america.gov/st/texttrans-english/2010/May/20100504083001bpuh7.084292e-02.html>.

2. U.S. Department of Defense, *Nuclear Posture Review Report*, 2010, iii, <http://www.defense.gov/npr/docs/2010%20Nuclear%20Posture%20Review%20Report.pdf>.

The protocols created for signature and ratification by the NWSs and others create an opportunity for them to show their support for the significant diplomatic and non-proliferation successes that these regional treaties represent.³ The protocols are legally binding and represent an important part of the nuclear-weapons-free zone treaties. It is in this context that the United States gained significant goodwill among the non-NWSs by announcing its intention to ratify the protocols during the NPT Review Conference of 2010. Without this step, and others, achieving a final document would have been more difficult, if not impossible. Yet the United States would further build on the nonproliferation regime, advance its interests, and increase its security by taking the final step and ratifying the protocols in order to make a more lasting signal of support and recognition of the work of these states to stop the spread of nuclear weapons around the globe.

The African Nuclear-Weapon-Free-Zone Treaty

The African Nuclear-Weapon-Free-Zone Treaty, signed in 1996 at Pelindaba, South Africa, the site of the former South African nuclear weapons program, created a zone free of nuclear weapons that includes the entire African continent as well as numerous islands and archipelagos off the coast of Africa.⁴ The Pelindaba Treaty, as it is known, entered into force on July 15, 2009, with the ratification of the 28th state party. Pelindaba contains provisions that ban all nuclear-weapons-related activities from development to use, while also promoting important nuclear security and safeguards initiatives that are the bedrock of the nuclear nonproliferation regime. The treaty creates an African Commission on Nuclear Energy to serve as a forum for facilitating the obligations of ratifying states required under the treaty, including exchanging information, arranging consultations, and reviewing the application of safeguards. The zone's ratification highlights a unique milestone in nonproliferation efforts: the verified dismantlement of two nuclear weapons programs (one that yielded a small arsenal of nuclear weapons). Concomitantly, Africa has endured nuclear testing on its soil by foreign powers, including France and, arguably, others.⁵ It is in this context that the leaders of African nations took the important step of moving beyond the region's nuclear past, both in terms of testing and proliferation.

Although the United States is not and cannot be a party to the Pelindaba Treaty itself, there are three protocols attached to it that are open for signature and ratification by the five nuclear powers under the NPT. Ratification would legally bind the United States to the letter and spirit of the three protocols. The protocols allow the NWSs to demonstrate their support for the actions taken by the region to promote and support the nonprolifera-

3. In some cases, due to the regions' colonial pasts, non-nuclear weapon states, such as Spain in the case of the African zone, are called upon to ratify specific protocols of the treaty.

4. "African Nuclear Weapons-Free Zone Treaty (Pelindaba Treaty)," http://www.africa-union.org/root/au/documents/treaties/Text/African_Nuclear_Weapon.pdf.

5. Julien Peyron, "Four Decades of French Nuclear Testing," March 24, 2009, <http://www.france24.com/en/20090324-four-decades-french-nuclear-tests-atomic-bomb-gerboise-bleue-algeria-polynesia>. See also Jeffrey Richardson, "The Vela Incident," *National Security Archive Electronic Briefing Book No. 190*, May 5, 2006, <http://www.gwu.edu/~nsarchiv/NSAEBB/NSAEBB190/index.htm>.

tion regime. The participation and commitment of the NWSs is and will be required to ensure participation from African nations in nonproliferation efforts. Protocol I obliges the NWSs (the United Kingdom, China, France, Russia, and the United States) not to threaten or use nuclear weapons against any party to the treaty. This negative nuclear security assurance is a standard protocol in numerous nuclear-weapons-free zone treaties that allows for ratifying states to increase their security by forswearing nuclear weapons.

By ratifying this protocol, the United States and the other NWSs recognize the decision of the ratifying states to uphold their treaty obligations under the NPT and reward the effort by ensuring that nuclear threats are never wielded. Protocol II requires parties to abstain from testing a nuclear device anywhere within the treaty zone. This protocol strengthens the norm against testing nuclear weapons within the zone. Finally, Protocol III calls upon states to ensure they do not violate any provision of the treaty within the zone. It is important to note that this protocol would not limit the U.S. military from calling at ports, even with nuclear weapons aboard, because the treaty text leaves such decisions to the discretion of the host country. This provision preserves the sovereignty of each nation to decide on its own accord whether or not it would allow such a vessel to call at its port or land at its airport.

The South Pacific Nuclear-Free-Zone Treaty

The Rarotonga Treaty was signed, as its name suggests, in the capital of the Cook Islands in August of 1985.⁶ It entered into force the following year, in December 1986. It has since been ratified by all states that are party to the treaty. The zone includes Australia, New Zealand, and 11 South Pacific states. The treaty bans nuclear weapons activities, including testing and development. Rarotonga, similar to Pelindaba, was conceived in the context of a long history of nuclear weapons testing by foreign powers. The United States and France tested nuclear weapons in the South Pacific. As no state in the region has attempted to develop nuclear weapons, the main impetus for the treaty was to ensure that environmental disasters resulting from nuclear testing and nuclear dumping do not occur in the region. In addition, South Pacific countries such as New Zealand have a long history of promoting the norm of nonproliferation, which has manifested itself in the successful ratification and implementation of the Rarotonga Treaty. Comparable the Pelindaba Treaty, the South Pacific Zone creates a Consultative Committee that can meet from time to time to facilitate the activities and obligations outlined under the treaty.

Similar to Pelindaba, the Rarotonga Treaty contains three protocols for signature by the NWSs. France and the United Kingdom have ratified all three protocols, while Russia and China have ratified Protocols II and III but not I.⁷ Protocol I obliges ratifying states to uphold the prohibitions on territories within the zone that any state controls.

6. "South Pacific Nuclear Free Zone Treaty (Treaty of Rarotonga)," http://www.nuclearfiles.org/menu/library/treaties/nuclear-free-zones/trty_rarotonga-south-pacific-nuclear-free_1986-12-11.htm.

7. Center for Nonproliferation Studies, "South Pacific Nuclear-Free Zone Treaty," May 5, 2011, http://www.nti.org/e_research/official_docs/inventory/pdfs/spnfz.pdf.

With regard to the United States, this includes only American Samoa and Jarvis Island.⁸ In other words, if the United States were to ratify the treaty, it would be obligated when operating in these two areas to uphold the tenets of the treaty and to ensure that no banned nuclear activities are undertaken. Given that the United States does not have significant military installations in either of these areas, this protocol effectively places no limits on the U.S. military to protect and defend the United States and its allies. Guam, notably, is not within the treaty zone, and ratification of the protocols would have no effect on U.S. military actions therein. Protocol II creates legally binding negative nuclear assurances for the states that are party to the treaty, similar to the Pelindaba Treaty. Protocol III is concerned with ensuring that the NWSs agree to forgo nuclear testing within the region. Although the United States and France have forgone nuclear testing, this would be an important signal to the region that the United States is willing to enter into a legally binding agreement on the matter.

In short, the protocols of the Rarotonga Treaty are already consistent with U.S. nuclear policy. Although ratification would assume a higher level of permanence and commitment, the protocols do not bind the United States or other NWSs in a way that could conceivably render their security in jeopardy; nor would the treaties limit any foreseeable action that the United States might need to take to protect its interests or security or those of its allies. Indeed, the treaty will not require the United States to make posture changes; nor will it allow any inspections of nuclear facilities or amend existing agreements with allies. The potential benefits of the protocols, if ratified, far outweigh any drawbacks.

Strengthening Safeguards

The norm of nuclear nonproliferation and adherence to international agreements governing the safeguarding of nuclear material and facilities is undergirded by the NPT but further supported by crosshatching agreements, United Nations Security Council resolutions, and treaties such as nuclear-weapons-free-zone treaties. Although there is very little in either treaty that is new in terms of limits on nuclear activities, the treaties buttress the nonproliferation regime by enshrining the principles of the NPT in a regional dynamic. Within the regional context, states that are party to the treaties are further bound by their agreements with their regional partners to follow and execute established nonproliferation norms. Though most states within the two zones discussed here may not have the ambition or the capability to successfully pursue nuclear weapons, some are important sources of material, know-how, and technology relevant to nuclear weapons programs. Efforts to increase safeguards and further limit the spread of material and technology are worthwhile and certainly are an important goal of U.S. nonproliferation policy. These treaties help achieve this by crosshatching states' commitments to implement safeguards.

The United States is no doubt more successful in strengthening safeguards globally when it has the support of as many states as possible. To obtain this support, the United

8. Ibid.

States must also recognize the nonproliferation goals of other states. This quid pro quo requires the United States to give up very little while gaining increased support for the safeguards regime. Clearly, the two regions examined here found a consensus on a set of nonproliferation actions that they saw as necessary for their security. By recognizing this, the United States can enlist the support of these states when needed for other nonproliferation efforts by supporting their regional disarmament interests in the form of ratifying the protocols of the treaties. In doing so, the United States will be able to point to provisions in the treaties' texts that are aligned with its goals and interests. When endeavoring to secure the support of another state, having legally binding language to support one's argument is certainly helpful.

Although the benefits of ratification of the protocols may be difficult to quantify, there is no doubt that the issue of recognition is important to a significant number of non-NWSs.⁹ Ratifying the protocols is a no-cost action that the United States can take to demonstrate its interest in working with non-NWSs to limit nuclear proliferation. No doubt, without the help of non-NWSs, the United States would find it very difficult to limit the spread of nuclear material and technology globally. For example, the African zone is home to two of the top five uranium producers in the world: Niger and Namibia.¹⁰ Though there is not great concern that Africa's uranium will end up in the hands of potential proliferators, this treaty serves as a bulwark to ensure that the material never does. According to the treaty, ratifying states agree to not aid, in any way, potential proliferators and are required to implement the safeguards of the International Atomic Energy Agency for all relevant facilities. Surely the United States would have a stronger argument for increasing safeguards at facilities, if need be, having recognized the Pelindaba Treaty through the ratification of its protocols, given that it legally binds ratifying states to ensure that the facilities are properly safeguarded.

In addition, South Africa maintains a significant peaceful nuclear infrastructure and has a checkered past as a waypoint for dual-use items destined for proliferators, leaving aside its own proliferation history. Indeed, the Pelindaba Treaty prohibits ratifying states from engaging in nuclear trade with states without a comprehensive safeguards agreement. This condition is an important driver of a stronger safeguards regime that would advance U.S. nonproliferation efforts around the globe. With U.S. support and ratification of nuclear-weapons-free-zone treaties, provisions such as this give the United States yet another argument to advance its own nonproliferation objectives in reaching agreement on safeguarding facilities both within the region and globally, as such actions usually require multilateral support. In essence, these treaties supplement U.S. multilateral efforts to strengthen safeguards globally, a key tenet of the 2010 Nuclear Posture

9. As is the case in many review conference documents, paragraph 103 of the 2010 NPT Review Conference Final Document urges nuclear weapon states to ratify the accompanying protocols of all nuclear-weapons-free-zone treaties. See "Final Document," 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, 2010, http://www.un.org/ga/search/view_doc.asp?symbol=NPT/CONF.2010/50%20%28VOL.I%29.

10. "World Uranium Mining," World Nuclear Association, September 2011, <http://www.world-nuclear.org/info/inf23.html>.

Review.¹¹ As mentioned above, these provisions give nonproliferation a regional as well as global foundation, strengthening the ability of the international community to limit nuclear proliferation.

Finally, the Pelindaba Treaty has provisions that have proved important to nuclear security, a threat that President Obama declared to be one of the greatest to U.S. national security.¹² Notably, a number of states that are party to the two zones were in attendance. The key objective of the nuclear summit is to ensure the protection and lockdown of all fissile material within four years. South Africa, having been the victim of an assault on one of its most sensitive nuclear facilities containing fissile material, is acutely aware of the threats this type of material poses.¹³ Indeed, other countries, such as the Democratic Republic of the Congo, also hold stocks of highly enriched uranium and other dangerous nuclear material vulnerable to theft. The Pelindaba Treaty contains a provision calling on states to “maintain the highest standards of security and effective physical protection of nuclear materials, facilities and equipment to prevent theft or unauthorized use and handling.”¹⁴ In other words, the United States would most certainly find greater receptivity in ensuring the physical protection of this material by arguing that the states also have obligations under their regional treaty. To advance this argument, the United States must ratify the protocols, lest it look hypocritical. Without U.S. leadership and technical assistance, it is unlikely that adequate measures will be taken in these regions to address the threat. These treaties, once ratified, will give the United States increased opportunities to build a stronger multilateral coalition to address the threat of nuclear security.

Benefits for the NPT Review Process

Ratification of nuclear-weapons-free-zone protocols by the NWSs has been a perennial issue at each review conference since the signing of the Treaty of Tlatelolco. As mentioned above, in the 2010 NPT Review Conference’s Final Document, the NWSs were urged to ratify the protocols outstanding on *all* nuclear-weapons-free-zone treaties. Consistently, large numbers of non-NWSs have noted their interest in NWSs recognizing their efforts to prevent nuclear proliferation and strengthen safeguards. Although the NPT Review Conference process has many moving parts and competing narratives, there is no doubt that a demonstration of support for the protocols would strengthen the United States’ hand in dealing with non-NWSs, considering the salience of the issue in the last few decades. Ratifying the protocols is an essential part of achieving a Final Document in the interest of the United States; doing so is a no-cost way of getting there. Though a final document at the end of a review conference is not in and of itself beneficial, the support of all nations, not just the NWSs, is required to uphold and strengthen

11. U.S. Department of Defense, *Nuclear Posture Review Report*, 9.

12. Barack Obama, “Speech at the Nuclear Security Summit, April 2010,” April 13, 2010, <http://www.cfr.org/proliferation/obamas-speech-nuclear-security-summit-april-2010/p21889>.

13. Michael Wines, “Break-In at Nuclear Site Baffles South Africa,” *New York Times*, November 15, 2007, <http://www.nytimes.com/2007/11/15/world/africa/15joburg.html>.

14. “African Nuclear Weapon –Free Zone Treaty,” Article 10.

the global nuclear nonproliferation regime, and a Final Document coming out of NPT Review Conference is one demonstration that the regime is working. Without support from the non-NWSs, the nonproliferation regime would be far less effective, to the detriment of U.S. national security. Demonstrating, in good faith, an effort to recognize the important work of the zones has benefits beyond the NPT Review Conferences; it creates momentum for increased support for the United States' other nonproliferation goals.

Impact on the Hard Cases

Given the history of nuclear proliferation on the African continent, the Pelindaba Treaty is a success story in both the nonproliferation and disarmament areas. With the denuclearization of South Africa and the dismantlement of Libya's burgeoning nuclear program, the Pelindaba Treaty marked the reversal of the views of two states that at one point believed that nuclear weapons were essential to their security. Indeed, before their dismantlement, it was widely believed that Libya and South Africa were also hard cases.¹⁵ Surely the work of nations within Africa to enact a nuclear-weapons-free zone contributed to the success of these disarmament efforts. Although not the whole story, rejection of nuclear weapons by a large majority of African nations is an important sign to those within the region that have nuclear ambitions that their actions will not be looked upon kindly by the NWSs or by their neighbors. The legally binding zone increases the political cost of proliferation on the continent and also increases the ability to detect would-be proliferators.

It would be wise for the United States to show support for these efforts by ratifying the protocols. The Pelindaba Treaty's success shows that nuclear-weapons-free zones should not simply be attempted in regions where no nuclear weapons exist, but can be an aspiration in regions where they do exist, such as the Middle East and South Asia. The Pelindaba experience shows that regional disarmament is possible in regions where nuclear arsenals also exist. This fact is an important one that is overlooked by the standard argument that nuclear-weapons-free zones are only applicable in regions where states have already made the decision not to proliferate. Certainly, Africa's experience can serve as an example to other regions.

The treaties also support efforts to halt the ability of proliferators to obtain material, technology, and know-how to further their nuclear programs. South Africa, it is now widely known, was a key transit state that Pakistan used in order to acquire sensitive technology for its weapons program.¹⁶ The same is true for Libya; A. Q. Khan took advantage of key loopholes in its export controls to proliferate by way of South Africa

15. Note that in parts of this paper, the benefits of ratification of the South Pacific Nuclear-Free Zone protocols is not discussed in depth as compared with the African Zone because there is a more salient history of proliferation and potential benefits in the case of Africa as opposed to the South Pacific. Although the zone may be less important than Africa in global nonproliferation efforts, there are still substantial and similar benefits to ratifying the Rarotonga protocols.

16. For greater detail on South Africa as a waypoint for sensitive fuel cycle technologies destined for proliferators, see David Albright, *Peddling Peril: How the Secret Nuclear Trade Arms America's Enemies* (New York: Free Press, 2010).

and other countries. Now, codified by national and international law, Pelindaba has made it more difficult for countries such as Iran and North Korea to procure items that were more easily attainable in the past through third-party states. This is not to say that South Africa was complicit in these trades, but that the necessary legal and law enforcement framework was not in place at the time. Pelindaba is one of many institutions that supports and requires all ratifying states to ensure that they are not unknowingly or knowingly serving as a transit point for sensitive nuclear technology.

Although the Pelindaba Treaty may not be solely responsible for the closing of these loopholes, there is no doubt this effort will strengthen U.S. national security by making it more difficult for countries such as Iran and North Korea to acquire the technologies needed to support their nuclear programs. This point should be recognized throughout the process of ratification. In contrast, the Rarotonga Treaty is less focused on addressing the illicit nuclear trade, because the region does not have nearly the same scope of resources, technology, and know-how. Regardless, with the ratification of the protocols, the United States is able to further advance its nonproliferation goals by recognizing the efforts of other countries in stopping proliferation. This situation, in turn, will increase the United States' ability to obtain support from key nations to isolate proliferators.

Negative Security Assurances Bound by International Law

The *Nuclear Posture Review Report* of 2010 updated U.S. negative security assurance policy by moving away from the policy of holding out the threat of nuclear retaliation in response to a biological or chemical attack from nuclear as well as non-NWSs. The previous policy of calculated ambiguity did not run parallel to the principles set forth in Protocols I and II of the Pelindaba and Rarotonga treaties, respectively. Currently, however, the policy is aligned with the principles of the two treaties:

The role of U.S. nuclear weapons to deter and respond to non-nuclear attacks—conventional, biological, or chemical—has declined significantly. The United States will continue to reduce the role of nuclear weapons in deterring non-nuclear attack. To that end, the United States is now prepared to strengthen its long-standing “negative security assurance” by declaring that the United States will not use or threaten to use nuclear weapons against non-nuclear weapons states that are party to the Nuclear Non-Proliferation Treaty (NPT) and in compliance with their nuclear non-proliferation obligations.¹⁷

This statement represents an important declaratory policy change, which allows the United States to ratify the protocols without having its declaratory policy conflict with its treaty obligations. The codification of this policy, bound by international law, will further allow the United States to attain greater international support for its nonproliferation goals by assuring non-NWSs in good standing with the NPT that they will never be threatened with nuclear weapons by the United States. In essence, this is yet another way

17. U.S. Department of Defense, *Nuclear Posture Review Report*, viii.

that the United States can easily, and at no cost, increase support for nonproliferation objectives among the many nonaligned states.

Ratifying the protocols would also decrease the salience and envisioned uses of nuclear weapons in U.S. national security policy without risk to U.S. national security, a key requirement of U.S. policy that spans both Democratic and Republican presidential administrations. By forswearing nuclear threats and their use in these areas, the United States strengthens the argument that nuclear-weapons-free-zone parties have made: Nuclear weapons are not necessary for ensuring the security of non-NWSs. Forcefully supporting this argument by ratifying the protocols can only strengthen this argument.

Opposition

Opposition to the Pelindaba and Rarotonga treaties is focused on two implications that would, it is argued, harm U.S. national security in the event of ratification. Although the Senate has not yet begun to debate the merits of the protocols, this paper outlines the reaction of those who oppose ratification to the initial announcement to send the protocols to the floor of the U.S. Senate. First, Senator John Kyl (R-Ariz.), in a statement posted soon after the Obama administration announced its plan to send the treaties to the Senate for advice and consent, expressed worry that ratification would “limit the instances in which the President would use nuclear weapons to defend the United States and its allies from attack.”¹⁸

Yet, in this case, limiting the situations in which the president will use nuclear weapons enhances the United States’ security, not the opposite. Implicit in this criticism is the idea that such a policy has negative implications for the United States’ ability to defend itself and calls into question its policy of extended deterrence. In other words, Kyl and others argue that we cannot ratify such a protocol without going against our commitments to allies. Yet it is impossible to imagine a situation in which the United States would need to use nuclear weapons in these regions. Certainly there has been no public concern raised by U.S. allies with regard to these protocols. If there had been, it likely would have been noted by Senator Kyl in his statement or come out after Secretary Clinton’s initial statement. Indeed, two NATO allies—France and the United Kingdom, both nuclear powers—have already signed on to the treaties’ negative nuclear security assurance protocols as well others.

The issue here boils down to whether or not one would rather hold out the opportunity to threaten or use nuclear weapons in Africa or the South Pacific or reap the benefits of these regions’ increased support for the United States’ nonproliferation agenda while also strengthening the nonproliferation regime globally. Indeed, there is also a knee-jerk reaction to binding the United States to international laws in some quarters, lest the United States then find itself in a position where it must make the choice between upholding

18. Jon Kyl, “Kyl Statement Regarding African and South Pacific Nuclear Weapon Free Zone Treaties,” May 5, 2011, http://kyl.senate.gov/record_print.cfm?id=332731.

the law and protecting its interests or security. Although there are certainly treaties where this is arguably so, the protocols of these two treaties are not among them.

In the context of these protocols, it is important to recognize that the U.S. nuclear arsenal and policies governing it do not exist in a vacuum. Instead, in order to limit the nuclear proliferation that threatens the United States and its allies, the United States must accept limits on its own forces where and when it is advantageous to do so. These limits will in no way affect the president's ability to defend the United States and its allies. Yet even those most opposed to ratification would most likely concede that the United States would find some political benefit among the ratifying states. Therefore, as this paper has made clear, ratification will yield benefits to U.S. proliferation goals but does not require the United States to change its policies, move its forces, or rethink its agreements with allies in order to do so.

Second, many argue that the Pelindaba and Rarotonga treaties do nothing to stop key NWSs, such as North Korea and Iran, from proliferating.¹⁹ Indeed, some of the benefits of ratification are not easily observable. But by supporting a global norm of nonproliferation by ratifying the protocols, one can only be furthering the goal of promoting adherence to the NPT and the broader nonproliferation regime. It is easy to forget that the nonproliferation regime, imperfect as it may be, was created by numerous small steps over the past 50 years. The ratification of these protocols is a step the United States should take. Doing so will, in the long run, further isolate proliferators while also altering the cost/benefit calculus of states weighing the merits of proliferation. Even so, there are still concrete measures, discussed in this paper, that do affect the ability of North Korea and Iran to proliferate. Parties to these treaties are legally obligated to decline any offer by North Korea, for example, to buy nuclear material or technology until it has satisfied its obligations under the NPT. As the United States pursues its policies of isolating proliferators such as Iran and North Korea, a broad coalition will be required for success, and ratifying the protocols of these two treaties—which cover more than 60 states, or nearly a third of all states in the world—is a step in the right direction.

Conclusion

The United States has a national security rationale for ratifying the protocols of the Pelindaba and Rarotonga treaties; the principles enshrined within the protocols are aligned with U.S. policies as well as the United States' interest in stopping nuclear proliferation around the globe. The potential cooperation and goodwill gained from ratifying the protocols, as well as the recognition that the United States would bring to the treaties, is an important step in the right direction as the United States continues to ensure its safety and security as well as those of its allies. Although these treaties are not quantum leaps in turning the clock back on current proliferators, because we do not know who may be on the list in the future, erecting barriers to future proliferation at no cost to the United States can only be in its interest. In many ways, it is hard to see why such an uncontro-

19. Ibid.

versial set of provisions would encounter any opposition at all. Indeed, the simple fact that no state that is party to a nuclear-weapons-free-zone treaty has ever proliferated strongly suggests that the United States should be in the business of supporting these types of treaties.

Contextualizing and Engaging Russian Nuclear Policy

Alejandro M. Sueldo

Drawing upon interviews with experts, this paper examines the role that nuclear weapons play in Russia's foreign and defense policy, with a particular focus on their relation to arms control; the NATO ballistic missile defense system; Russian military reform; and the role of NATO, Iran, the United States, and China. The paper concludes that for the foreseeable future, Russia will continue to depend on its nuclear weapons for its real and perceived status and security. And Russia will thus be reluctant to engage in further strategic arms reductions and talks on tactical nuclear arms control, particularly without greater clarity with regard to the near-term U.S. political climate, and greater assurances both that China will not reach for strategic parity and that NATO missile defense will not threaten Russia. This paper also finds that nuclear weapons will likely play a greater role in a reformed Russian military and that reductions in Russia's tactical nuclear weapons arsenal will largely depend on greater assurances regarding China's nuclear forces, greater transparency with respect to the U.S. program for a prompt global strike, and efforts to revive talks on conventional forces in Europe. The paper also discusses how to engage Russian nuclear policy and concludes with an examination of latent challenges and promising opportunities.

Russian Nuclear Weapons: Doctrine and Prestige

Russia's international status has been largely based upon three pillars: (1) its permanent seat on the UN Security Council; (2) hydrocarbon prices; and (3) its sizable nuclear

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force. The effectiveness of the first two pillars is waning, however. The first pillar ebbs and flows with the advent of crises and is challenged by efforts to expand the council. The future of the second pillar largely depends on hydrocarbons' mainly European consumers. Therefore, the third pillar, Russia's nuclear weapons, play the predominant role in sustaining its prestige and power in the international sphere and remain the only military component that still makes it a global power. Accordingly, nuclear issues, and particularly arms control, remain a valued aspect of Russian foreign policy because for relatively little expense, Russia's nuclear forces support the country's status as a great power, provide a deterrent to other major powers, enable it to maintain moderately sized conventional forces, and allow it to be in this respect an equal partner with other powers, especially the United States.¹ In this sense, because Russia needs nuclear weapons to maintain its status, it is reluctant to cut the size and capabilities of its strategic nuclear force and is sensitive to any potential devaluation of its force by the United States and NATO ballistic missile defense systems. Though Russian nuclear policy is very much driven by status, Moscow also aims to achieve more tangible security objectives through its nuclear weapons.

Russia is also reluctant to cut its nuclear force because nuclear arms play a major role in its national security. Per its new 2010 defense doctrine, nuclear weapons are important in the prevention of nuclear war and military conflicts that use conventional assets in regional and large-scale wars.² But, unlike the old 2000 doctrine, the 2010 doctrine scales back the threshold for using nuclear weapons from critical situations to when the "very existence" of Russia is under threat. Therefore, because Russian defense doctrine does not embrace a "no first-use" policy, it is possible that if an attack were to threaten Russia's existence or vital interests, it would be inclined to use nuclear arms to deter or repel such an attack. This is "seen as a means of deterring or dissuading states that might attack Russia with conventional armed forces, [and] an expression of concern that similar escalation might take place elsewhere."³ The new doctrine, however, does not define a clear role for tactical nuclear weapons, and devotes less attention to nuclear weapons than to conventional forces—likely reflecting a greater focus on Russia's ongoing conventional military reform.

The importance given to nuclear weapons, however, distracts Russia's military leadership from paying more attention to nontraditional security challenges, such as internal unrest and regional Islamic extremism. Furthermore, this emphasis on nuclear weapons also undermines concerted efforts to reduce the level of nuclear confrontation with the

1. Ruslan Pukhov, "Why Missile Defense Talks Will Fail," *Moscow Times*, May 27, 2011, <http://www.themoscowtimes.com/opinion/article/why-missile-defense-talks-will-fail/437644.html>.

2. "Military Doctrine of the Russian Federation," February 5, 2010, http://news.kremlin.ru/ref_notes/461.

3. Nikolai Sokov, "The New, 2010 Russian Military Doctrine: The Nuclear Angle," James Martin Center for Nonproliferation Studies, February 5, 2010, http://cns.miis.edu/stories/100205_russian_nuclear_doctrine.htm.

West at a time when the need for nuclear weapons as a deterrent is declining. Russian nuclear weapons thus largely remain a key foreign policy tool, whether used as a threatening mantra or a bargaining chip through which to engage global powers (i.e., the United States and NATO). Indeed, the role nuclear weapons play also induces Russia to pursue unnecessary weapons—such as its proposed heavy, liquid-fueled, multiple independently targetable reentry vehicle (MIRVed) intercontinental ballistic missile purportedly capable of evading the United States–led missile defense—in seeking to maintain the credibility of its deterrent and the associated political and security leverage.

Arms Control

Historically, arms control was perceived as a means to avoid the serious threat of nuclear war. Today, however, this is largely not the case. The threat of nuclear war between the United States and Russia is very low, and interest in arms control to reduce tensions is thus lower in U.S. and Russian priorities. Therefore, interest in pursuing arms control lies elsewhere. New START offers an example: The United States and Russia wanted the treaty and its resulting benefits. The leadership of presidents Obama and Medvedev in its negotiation, and the exclusion of problematic issues that would have delayed its completion, are indicative of this.

Although much has been written and debated on the merits of New START, as evinced by the varying opinions of experts, this issue is outside of the scope of this paper. This paper is more concerned with how arms control efforts, including New START, affect U.S.-Russian relations and drive Russian nuclear policy. At a time when Russia is not a relatively high priority for the United States, New START was a low-hanging fruit that the United States could use to reengage with Russia on a familiar footing after a lull in arms control talks and years of tense relations. The treaty is also easy to explain publicly and does not affect other sensitive aspects of the bilateral relationship. Russia, however, sought to extract greater concessions from the United States, such as by linking offensive-defensive systems. Even so, New START allows Russia and the United States to showcase their leadership in nuclear disarmament while meeting their Nuclear Non-Proliferation Treaty (NPT) Article VI obligations. New START's April 2010 signing before the May 2010 NPT Review Conference underscored this effort. The treaty also prevented the collapse of the strategic arms control regime and fostered the environment and trust needed for engaging Russia on other key bilateral issues.

For the United States, New START helped President Barack Obama distinguish himself from the years of tense U.S.-Russian relations during President George W. Bush's administration by producing a relatively quick win for bilateral ties. The treaty also helped garner Russian cooperation on, among other issues, Afghanistan and the American military presence in Kyrgyzstan, at a time when Russia was quite skeptical about NATO–International Security Assistance Force operations in Afghanistan and was becoming concerned with what will happen after their gradual withdrawal in coming years. The treaty was also important to help President Dmitry Medvedev secure a key foreign policy accomplishment. This helped strengthen Russian political and foreign

policy actors, such as Medvedev, who support improved ties with the United States, and helped differentiate them from more recalcitrant, America-weary Russian leaders, such as Prime Minister Vladimir Putin. For Obama, New START was also key to promoting his Prague agenda, and thus represented an early step in a long-term arms control process that envisions the inclusion of other nuclear states, namely, China. More immediately, it was important for the United States that the verification and transparency of Russia's nuclear forces continue following the expiration of the original START.

In Russia, arms control is valued more for its political significance. Just as nuclear weapons give Russia status, their reduction—at least notionally—also helps Russia maintain its status as a partner with and global power vis-à-vis the United States. The ability to engage the United States and the prestige this yield for Russia is a key reason why Russia seeks nuclear disarmament treaties with the United States. It is also important for Russia to maintain approximate parity of strategic weapons with the United States. New START preserved this by setting legally binding caps on the number of warheads and delivery vehicles.

For Russia, the disarmament and verification procedures of New START do not conflict with the role that nuclear weapons play in Russian national security policy. The treaty's easy ratification by the Russian Duma is indicative of this. Indeed, New START afforded Moscow political cover for a strategic force reduction process that would occur independently of the treaty, given the obsolescence and decommissioning of Russia's older weapons and the inability of Russia's aged military-industrial complex to make up for reductions.⁴ The treaty also gives U.S. and Russian planners predictability by setting limits on warheads and delivery vehicles. Therefore, through boundary-setting, transparency, and confidence-building measures, the treaty allows for planning without needing to resort to worst-case scenarios, such as a rapid build-up in nuclear forces, which are more costly in the long term and foster suspicion of covert production or cheating.

Russia's Armed Forces

Nuclear weapons play an ever more important role in Russia's national security and its global status because of its degrading conventional armed forces and their relative inferiority to those of the United States, NATO, and China. Indeed, Russia's political-military

4. As of February 5, 2011, Russia had already cut its nuclear arsenal below the level required in New START: 1,537 deployed strategic nuclear warheads, just under the 1,550 ceiling it is obliged to reach by 2018, while the United States has 1,800. Each also agreed to limit its ICBM launchers, submarine-launched ballistic missile (SLBM) launchers, and heavy bombers to 800, deployed or not. The United States has 1,124 of these and Russia has 865. Finally, each committed to deploy no more than 700 ICBMs, SLBMs, and heavy bombers. The United States has 882 of these and Russia has 521. Thus, Russia has met two of the treaty's limits seven years early and is able to make further reductions. For a comprehensive discussion, see: U.S. State Department, "New START Treaty Aggregate Numbers of Strategic Offensive Arms," Bureau of Arms Control, Verification and Compliance, June 1, 2011, <http://www.state.gov/t/avc/rls/164722.htm>.

leadership is under no illusion that its conventional forces are very capable.⁵ Therefore, the Russian leadership attaches particular importance to the country's nuclear forces and thus allocates significant resources to maintaining them. However, this important role that Russia gives its nuclear weapons comes into tension with its deteriorating ability to develop new systems, which largely is due to the serious human resources and technological inadequacies of its military-industrial complex.

Military Reform

The ambitious and long-overdue military reform led by Russian defense minister Anatoliy Serdyukov represents a marked rejection of the doctrine of mass mobilization that dominated the globe throughout the Cold War and that currently characterizes Russia's armed forces.⁶ Indeed, the proposed reform, and accordingly Russia's resource allocation, reflects Russia's growing concern for internal and regional threats rather than a mass war with NATO. Budget realities, however, compel Russia to base its defense "on the cheap," by paying too much attention to the modernization of its nuclear deterrent and not enough to its conventional armed forces. In this sense, its dependence on its nuclear weapons for real and perceived prestige, power, and security diverts resources and attention from pressing and more challenging threats, such as terrorism, that do not require such expensive, high-technology responses. At the same time, enduring archaic views of the West in Russia, especially among its military leadership, still cloud its reform—as evinced by the planned deployment of brigades to its western and southern joint strategic commands, notwithstanding its improved relations with Europe. Although what will ultimately emerge from this reform is still unclear, experts agree that Russia's conventional armed forces will remain relatively inferior. Therefore, presumably, Russia will guard against powers through nuclear weapons, which in turn will retard its inclination to make reductions.

It is as yet unclear what official role nuclear weapons will play in a reformed Russian military. Experts assert, however, that an improvement in the quality of Russia's military will likely *not* result in a notable reduction in the role nuclear weapons play in the country's foreign and military policy. Indeed, some experts argue that their role will increase because, over time, the country's reformed conventional forces will be more capable of addressing pressing domestic and regional threats but will be even more inferior in size and quality to American, NATO, and Chinese forces. Therefore, Russia will depend on its intercontinental ballistic missiles (ICBMs) (i.e., its Topol-M missiles) to deter the

5. Alexander Golts, "Once Bitten, Twice Backward," *Moscow Times*, March 22, 2011, <http://www.themoscowtimes.com/opinion/article/once-bitten-twice-backward/433467.html>.

6. Of particular importance, the reform envisions a notable drawdown of ground forces to make them leaner and more expeditionary. Structurally, Russia will shift on the macro level from five military districts to three operational strategic commands, and at the micro level from a centric to a brigade structure. In this regard, there will be a move from a conscripted, large tank division-based army to a largely volunteer one with noncommissioned officers bridging the leadership link between rank and file. For a comprehensive discussion on Russia's military reform, see Ruslan Pukhov, ed., *The New Russian Army* (Moscow: Center for the Analysis of Strategies and Technologies, 2010), http://www.cast.ru/files/New_Russian_Army_sm.pdf.

other global powers, in great part because the reliability of its existing and developing submarine-launched ballistic missiles and bomber systems is increasingly questionable.

It is, however, important to differentiate between the roles played by tactical and strategic nuclear weapons in Russian nuclear policy. As long as Russia abides by its treaty obligations and continues to engage in reduction processes, the number of its strategic nuclear weapons is likely to decrease. A possible exception to this would be the development and deployment of the proposed heavy, liquid-fueled, MIRVed ballistic missile, which would indicate that strategic weapons are becoming more important. Russian tactical nuclear weapons, however, will likely play a greater role in deterring regional conflicts in the near future. But Russia's leadership recognizes that tactical nuclear weapons are not an adequate response to conventional attacks, and thus the country's military reform is also focused on developing nonnuclear systems that are a more credible deterrent and repellent force to conventional aggression.

Russia's Threat Perceptions

The United States and NATO: Familiar Enemies

Institutionally, NATO remains the main threat to Russia. This is reflected in comments by Russian military analysts and in technical journals, military exercises (e.g., Zapad), and in certain military deployments (e.g., Iskander missiles in Kaliningrad). This stance, however, contradicts Russian national security doctrine, which only posits NATO *expansion* as a threat. Experts argue, however, that in addition to lingering distrust, hawkish elements within Russia's military exaggerate perceived threats, such as U.S. missile defense and a prompt U.S. global strike, so that they can benefit from lucrative defense contracts for military programs, such as the proposed heavy, liquid-fueled ballistic missile, which are inadequate for tackling pressing threats. Furthermore, in its 2010 defense doctrine, Russia has added the deterrence of high-precision conventional arms to the mission of its strategic forces. This indicates that it will likely follow the United States in arming its own strategic-delivery vehicles with conventional warheads. Experts assert, however, that privately, a spectrum of Russian leaders recognize that war with NATO is unlikely, and indeed would be disastrous. This contradiction in perception and policy is driven by a Russian recognition that NATO remains a familiar enemy through which to garner domestic support, and is a more predictable and easier-to-explain threat. But uncertainty as to United States-led missile defense and NATO's relations with former Soviet states continues to foster distrust within Russia.

Russia is particularly concerned with conventional precision weapons and the counterforce potential they pose against its nuclear forces. These sentiments are particularly focused on the U.S. "Prompt Global Strike" program, which would give America the capability for a prompt and long-range strike on objects in any part of the world. But this Russian rationale is faulty because precision weapons need long preparation and attack times and require many missiles to damage nuclear forces.⁷ Furthermore, defenses

7. E. Miasnikov, "Long-Range Precision-Guided Conventional Weapons: Implications for

would have to first be neutralized, and of course there is the risk of nuclear escalation as a result of such an attack.⁸ But because Russia sees these weapons as a hypothetical threat, they will remain a hindrance to arms control.

Although it is unclear where Russian leaders stand on NATO–Russian relations, experts assert that Russia is increasingly inclined toward greater cooperation. First, Russia’s military reform, which is driven by its civilian leadership and is designed to address non-NATO contingencies, indicates that NATO is not viewed in practice as a preeminent threat by its leadership. These trends also call into question Russian assertions in public that NATO is a threat. Second, President Medvedev—by far more of a pragmatist than Prime Minister Putin—is not willing to stake Russia’s reputation and ties with the West on issues, such as Afghanistan, that are of key interest to both NATO and Russia. Third, cooperation is also driven by Russia’s recognition that its ability to influence European affairs is waning, and thus it risks being sidelined if it does not engage with other powers.

In the coming years, the international community should expect to see Russia continue its confrontational policy toward NATO because doing so helps garner domestic support, justify military programs, and challenge Western influence in former Soviet states. It is particularly important, however, that China’s rise and a plethora of pressing threats south of Russia’s border are increasingly pushing Russia’s attention eastward.

Iran: Hedging Bets

Russia does not view Iran, even a nuclear-armed Iran, as a real threat. Indeed, though it recognizes that trends are worrisome, Russia does not perceive an imminent threat from Iran (or North Korea), and thus it discounts the need for an elaborate missile defense system. Iran does not yet possess the missile range capabilities sufficient to threaten Russia. Even if Iran were to possess a nuclear weapon, as many experts foresee, Russia would use its nuclear deterrent and its historic ties with Iran to ameliorate any possible threat. In this regard, Russian experts draw parallels to Russia’s relationship with Pakistan, India, and North Korea, countries that possess nuclear weapons capable of reaching Russian territory but that in practice pose no real threat to Russia because it could obliterate them with its existing nuclear force.

Russia’s effort to maintain predictable and constructive ties with Iran drive its seemingly bipolar policy toward Iran. On the one hand, Russian political and bureaucratic leaders keen on showcasing international cooperation and building ties with Europe and America support efforts to constrain the Iranian nuclear threat. Wavering Russian cooperation on Iran’s Bushehr plant and its decision to not sell Iran the S-300 air defense system are both indicative of this sentiment. But this support is largely driven by a Russian interest in being recognized as a global leader and is used by Russia as a bargaining chip to leverage the West. Likewise, Iran uses the decision to enrich its uranium in Russia as a means to stall the Five-Parties-plus-One talks and advance its nuclear program.

Strategic Balance, Arms Control and Non-Proliferation,” International Comm. on Nuclear Non-Proliferation and Disarmament, 2009, http://ogos.dfat.gov.au/research/Miasnikov_Long_Range_Missiles-0921.pdf.

8. Ibid.

On the other hand, the reality of an impending nuclear Iran, along with the dominance of Russian leaders skeptical of the purported threat Iran poses, drives a Russian policy that seeks to maintain constructive ties with Iran. This hedging policy is driven by the idea that Russia prefers and has more to gain from a friendly, nuclear-armed Iran than one that is resentful because of Russian support for international efforts to constrain its nuclear program. In other words, though Russia does not want a nuclear Iran to become a threat, it recognizes that it could. Furthermore, this policy is also driven by three important factors: (1) Russia's military-industrial complex seeks to gain economically from ties with Iran; (2) Russia's political class, which is focused on America and will do anything to keep the United States in control, views Iran and North Korea as key to "checking" U.S. interests in their regions; and (3) much like the West, Russia recognizes that short of a military strike, it can do little to seriously curtail Iran's nuclear program.

Russia will continue to strike a balance between paying lip service to Western concerns regarding Iran and tempering Western efforts to constrain Iran's nuclear program. As Iran develops its own nuclear arsenal, Russia will remain a key conduit between the West and Iran, in part because this role gives Russia greater status internationally and makes the West depend on Russia, for issues such as UN Security Council sanctions. But as Iran accedes to the "nuclear club" and begins to move out from under Russia's political and military-industrial umbrella, Russia will increasingly depend on the political capital it has built with Iran over the years and its superior conventional and nuclear forces to protect against a possible Iranian threat.

China: Russia's Paper Tiger

Russia is increasingly focused on establishing its footprint in Asia, particularly in light of China's rise and Russia's interest in attracting investment in its Far East. This focus also reflects Russia's thus-far unsuccessful attempts to assert itself on Eurasian security issues. Although Russia does not publicly define China as a threat for fear of antagonizing it, in reality, China is perceived as a genuine concern by Russia's political and military leaders. Experts view the possibility of conflict with China as an open question. In addition to historical distrust toward Asians and China especially, Russia perceives China as an unpredictable country and is worried about its technological dominance, superior conventional forces, and demographic and economic expansion. Russia's saber-rattling in the Far East, though purportedly directed at Japan—a relatively weak target that boasts the protection of the United States—is in practice largely aimed at serving as a subtle signal from Moscow to Beijing. Along with Chinese socioeconomic encroachments (e.g., migrational and economic expansion) into Russia's sparsely populated yet resource-rich Siberia, Russia fears that China will, among other threats, use its superior armed forces to revive claims for bordering territory, de facto occupy Russian land, or cut off the trans-Siberian railroad. Therefore, in addition to being insecure about living next to a rising power, Russia ultimately views China's capabilities, rather than its intentions, as a threat.

Nevertheless, though there is no consensus on how these trends will evolve, experts agree that a military conflict with China is highly unlikely to occur in the foreseeable

future. This is because both Russia and China have much to lose and little to gain from a military confrontation, China is able to obtain needed resources elsewhere, and the nature of the Chinese threat cannot be dealt with by armed force. However, though the probability of nuclear war is a matter of guesswork, given Russia's conventional military inferiority, if its key interests were to be threatened, Russia might be inclined to use tactical nuclear weapons first, even though this would be met with a reciprocal Chinese reaction—and particularly if Russia had not yet deployed its own precision conventional weapons, which are more effective and destructive than imprecise conventional systems and offer a more credible and less escalatory deterrent than nuclear weapons.

Further strategic arms reductions by Russia will be constrained by its fear that China may be induced to achieve strategic parity. China could, over time, produce and deploy warheads and delivery vehicles sufficient to match Russia's strategic nuclear force. This possibility is worrisome to Moscow, not only because of the psychological impact it would have on Russia's insecurities regarding its Far East but also because at parity, Russia's nuclear deterrent force loses credibility in relation to the greater counterstrike potential of China's nuclear deterrent. Of particular concern to Moscow is Beijing's ability to deploy a greater number of long-range nuclear weapons that could threaten western Russia. Doing so, however, would violate China's NPT Article IV obligations and be met with a backlash from nuclear states that feel threatened.

Russian calls to engage other nuclear states in arms control implicitly refer to China. But Russia does not fully understand how to engage China on arms control and needs the United States to be involved to provide pressure to induce China to cooperate and political cover if efforts fail. Yet it appears that the Kremlin has so far avoided dialogue with Washington on this issue, either because of its mistrust of the United States or to avoid provoking Beijing. This seems shortsighted because Russia's future role as a second-tier global power will depend on its ability to find the right balance between the United States and China. Nonetheless, engaging China on arms control is not yet practical given the disparity in the size and type of their nuclear arsenals. However, without legal and political assurances from China, Russia will be reluctant to engage in strategic arms talks that would breach the psychological barrier of 1,000 warheads. Although it is unlikely that China will in the near future engage the United States and/or Russia in a binding legal framework, concerns would be ameliorated if China were transparent about the size and type of its existing and planned nuclear forces. It could also publicly state that it does not intend to increase the size of its arsenal, provided that the United States and Russia continue to reduce their nuclear forces and show that their missile defense systems do not undermine China's nuclear arsenal.

Although missile defense and precision conventional systems are of concern to Russia, real and perceived threats associated with China drive much of the uncertainty among Russian leaders as to the future of their country's nuclear policy. Because it is concerned with a sudden expansion of China's nuclear capabilities, Russia reserves the option of using its nuclear force to maintain its superiority and counterforce capability in relation to China. In this regard, Russian fears of China also remain an impediment to efforts to control and reduce Russian tactical nuclear weapons.

Russian Tactical Nuclear Weapons

Russia has made important strides to meet its 1991 and 1992 pledges to reduce the number of its tactical nuclear weapons and store a large part of its arsenal.⁹ But the lack of a binding, verifiable treaty has meant that reliable data are not available on the number of tactical warheads that Russia has, would need to destroy, put in central storage, or could continue to deploy.¹⁰

Tactical nuclear weapons, also referred to as nonstrategic nuclear forces (NSNFs), however, play an uncertain role in Russian national security because its 2010 doctrine leaves unclear how Russia would use NSNF. Experts assert that Russian reluctance to define their role or engage in reduction talks is largely driven by the belief that Russia may need to use its NSNFs to counter a potential Chinese aggression. In this sense, Russia's NSNFs compensate for Russia's inferior conventional force capabilities. In practice, however, Russia does not have a clear idea of why it needs NSNFs. The configuration of its 5,000-strong NSNFs (largely in western Russia) and their type (mainly for air or missile defense) do not reflect a true concern for a Chinese aggression.

Russia thus uses the perceived Chinese threat as a justification for maintaining sizable NSNFs. Indeed, experts argue that a comprehensive discussion in Russia on China is relatively nonexistent today, in part because Russia's NSNFs provide artificial assurances that China will not be a threat. Although it is unclear how Russia is exactly hedging against a Chinese threat, at a minimum, the number, type, and location of Russia's NSNFs indicate that they are more about political leverage than real military concerns.

9. The distinction between strategic and nonstrategic nuclear weapons reflects the military definition of, on the one hand, a strategic mission and, on the other hand, the tactical use of nuclear weapons. A strategic mission is directed against one or more of a selected series of enemy targets with the purpose of progressive destruction and disintegration of the enemy's war-making capacity and will to make war. Strategic operations are designed to have a long-range rather than immediate effect on the enemy and its military forces. In contrast, the tactical use of nuclear weapons is defined as "the use of nuclear weapons by land, sea, or air forces against opposing forces, supporting installations or facilities, in support of operations that contribute to the accomplishment of a military mission of limited scope, or in support of the military commanders' scheme of maneuver, usually limited to the area of military operations." For further discussion, see Amy F. Woolf, "Nonstrategic Nuclear Weapons," Congressional Research Service, February 2, 2011, <http://www.fas.org/sgp/crs/nuke/RL32572.pdf>.

10. In 1991, U.S. president George H. W. Bush and Soviet president Mikhail Gorbachev, and in 1992 Bush and Russian president Boris Yeltsin, made parallel but unilateral pledges—collectively known as the Presidential Nuclear Initiatives—to reduce the number of their tactical nuclear weapons and store the large part of their arsenals (but this was not defined). The initiatives only indicated the proportion of warheads to be eliminated. Washington, however, did not accept a Soviet proposal to negotiate a legally binding, verifiable treaty. For years the United States and Russia updated one another, and other countries, on the progress of reductions, but the last time Moscow formally reported on the status was in 2004. However, in a report distributed at the 2005 NPT Review Conference, Russia declared that it had reduced its tactical nuclear weapons to one-fourth of 1991 numbers. For further discussion, see "Reducing Tactical Nuclear Weapons in Europe," *Survival* 52 (2010): 75–96.

NSNFs cannot realistically be used against China. Indeed, if China is a threat, the nature of this threat, which largely takes the form of migrational expansion in Russia's Far East, cannot be dealt with by NSNFs.

Tactical nuclear weapons are further misunderstood in Russian thinking, in that they are also seen as a counterbalance to NATO, and, specifically, U.S. precision conventional weapons like those for a prompt global strike. Experts argue that Russia believes that use of its NSNFs to counter such capabilities would not necessarily lead to nuclear war, as is the case with strategic weapons. But as experts assert, the United States could not feasibly use a prompt global strike against Russia because a nuclear strike could be a likely response to such an attack. Indeed, there is no real military threat from the United States, NATO, or China that would require the use of tactical nuclear weapons. Thus, though symbolically NSNFs act as a counterbalance, in practice they are not. In this sense, Russian NSNFs have no military utility or deterrent value. Therefore, in practice, Russia's NSNFs are a means to keep an equal footing with the United States and are used as a bargaining chip for future discussions on arms reductions with the United States and other powers.

Missile Defense

The United States views several initiatives as means to reduce its reliance on nuclear weapons—including ballistic missile defense (BMD); command, control, and communications improvements; and precision conventional systems.¹¹ Russian experts assert that BMD also aims to achieve an important political goal: to unite NATO and demonstrate that the Euro-Atlantic bond is stronger than ever.¹² But BMD has provided anti-United States / NATO elements inside Russia with an external target to exploit for domestic politics, as occurred with the issue of NATO expansion, and a means to justify the development of new weapons.¹³ Because Russia's nuclear weapons are the only military component that still makes it a superpower on a par with the United States, Russia is very sensitive to any possibility of devaluing their role.¹⁴ At the same time, however, progress on BMD cooperation with Russia is the key issue for moving ahead with U.S.-Russian nuclear reductions and the broader United States / NATO–Russia relationship. Indeed, BMD is a test case for United States / NATO–Russia ties, and will in many respects determine much of what will follow. Likewise, cooperation with Russia is important to establishing a framework for what is likely going to be needed for a framework

11. Command, control, and communications refers to the ability of military commanders to direct forces.

12. Alexander Golts, "Bluster and the Ballot Box," *Moscow Times*, May 31, 2011, <http://new.themoscowtimes.com/opinion/article/bluster-and-the-ballot-box/437838.html>.

13. *Ibid.*

14. Alexander Golts, "The Boogeyman the Kremlin Loves to Hate," *Moscow Times*, February 9, 2011, <http://www.themoscowtimes.com/opinion/article/the-boogeyman-the-kremlin-loves-to-hate/430570.html>.

with China, which is concerned about BMD because it knows that even a modest BMD system could neutralize a country's nuclear capability.¹⁵

Russia privately recognizes that BMD, as planned, does not currently pose a challenge to Russia because (1) the ranges of planned interceptors are too far and too short and their number is too few to undermine Russia's strategic land-based nuclear missiles, and much less its submarine-launched ballistic missiles; and (2) technological and economic factors make it very difficult for the United States to create a missile defense system that could protect all U.S. territory in the event of a massive nuclear attack.¹⁶ Further, even if the United States builds an effective BMD system, neither the United States nor Russia will launch a nuclear attack against the other because there is no reason to do so and because it would lead to nuclear war. Although the technology and number of the SM-3 Block IIB interceptors of Phase IV of the European Phased Adaptive Approach, which most concern the Kremlin, could evolve with time, Russia must be receptive to U.S. information exchange, transparency, and trust-building initiatives on capabilities to ameliorate its concerns.

Much of Russia's opposition to United States-led BMD is therefore driven by political posturing, with two main aspects. First, Russia perceives that its influence in European affairs is limited and that BMD establishes a precedent by sidelining Russia on a pivotal European security issue. Hence Russia's insistence on engaging on BMD and European security reform while demanding binding assurances that BMD will not threaten Russia is an unrealistic request given U.S. domestic political realities. What Russia's leaders must recognize, however, is that they will be able to do little if the United States decides to move forward on BMD, with or without Russian cooperation. Indeed, Russian threats of an arms race at Europe's doorstep are empty because it would be politically regressive; insignificant, given that nuclear weapons could never be feasibly used against the West; and difficult to pursue with Russia's limited military-industrial capacity.¹⁷ Second, Russia, and particularly portions of its military, inflate the threat posed by BMD—especially in pivotal election years such as the current one—because (1) the electorate is best mobilized when the Kremlin can create the image of an enemy, and (2) it presents a familiar enemy that is superior in all respects and is perceived as ignoring Russia as insignificant.¹⁸ In this sense, BMD is widely used domestically to argue that Russia is threatened and encircled and that its capabilities are constrained.

15. Jorge Benitez, "Déjà Vu: Russia, US at Odds over Missile Defense," Atlantic Council, February 18, 2011, <http://www.acus.org/natosource/deja-vu-russia-us-odds-over-missile-defense>.

16. Ruslan Pukhov, "Why Missile Defense Talks Will Fail," *Moscow Times*, May 27, 2011, <http://www.themoscowtimes.com/opinion/article/why-missile-defense-talks-will-fail/437644.html>.

17. According to Defense Minister Anatoly Serdyukov, Russia can attain the 700 limit for nuclear delivery vehicles imposed by the New START only in 2028, and even this will be difficult to attain. Today, the United States has twice as many delivery vehicles as Russia. With this huge gap, which Russia will find difficult to close, Russia's threats of an "arms race" can hardly be treated seriously. See Alexander Golts, "Bluster and Ballot Box," *Moscow Times*, May 31, 2011, <http://new.themoscowtimes.com/opinion/article/bluster-and-the-ballot-box/437838.html>.

18. Ibid.

Prospects for BMD Cooperation

BMD cooperation with Russia is worth trying. Although it is unclear if this is technically possible, there remain difficult political issues and lingering distrust to be resolved. NATO has little faith in the ability of Russia's missile defense system—which is limited to an outdated installation in the Moscow region—to shoot down missiles that travel over Russian territory.¹⁹ Russia's missile defense system is designed for incoming enemy missiles that arc through space toward Moscow with the aim of intercepting a first strike and giving its leadership time to reach safe command centers.²⁰ Thus, Moscow's idea of "sectoral missile defense" is a nonstarter because NATO and Russian missile defense systems are currently incompatible.²¹ Therefore, the most Russia can hope for is separate but coordinated BMD systems whereby Russia's radar installations—such as the one in Gabala, Azerbaijan (which demonstrates better detection characteristics)—would detect Iranian launches while NATO would detect and intercept missiles flying toward Europe. Russia, however, is far behind on interception capabilities, given that its S-500 interceptor missile system currently in development is still far from ready. These BMD systems, however, would not be integrated. Any notion that Russia would have shared command is militarily impractical and politically unpalatable for NATO members.²²

Although experts are skeptical as to the success of BMD cooperation, they argue that it is nonetheless important to seek to create some form of long-term framework so as to show that it is not targeted at undermining Russia's nuclear deterrent.²³ What is promising is that decisive voices among Russia's leadership appear to support cooperation, for now. Thus, the Kremlin has likely accepted that the best way to deal with Phases III and IV is to be involved in BMD, at least as a means to have real or even the perception of input in its development.

The way forward is to build trust through practical cooperation while leaving some larger ideological disagreements to be resolved later, when suspicions have been assuaged.²⁴ Technical cooperation helps surf the ebbs and flows of subjective estimates of

19. Alexander Golts, "The Boogeyman the Kremlin Loves to Hate," *Moscow Times*, February 9, 2011, <http://www.themoscowtimes.com/opinion/article/the-boogeyman-the-kremlin-loves-to-hate/430570.html>.

20. Ibid.

21. NATO would be responsible for defending against Russian-bound missiles that travel over its territory, and Russia would be responsible for NATO-bound missiles that travel over its territory.

22. Simon Shuster, "Moscow Wants a Finger on Europe's Nuclear Shield," *Time*, May 24, 2011, <http://www.time.com/time/world/article/0,8599,2073757,00.html>.

23. Benefits from NATO-Russia BMD cooperation: It could strengthen transparency into U.S. and NATO BMD motives and plans; enhance regional stability; dissuade states from proliferating; deploying, and using ballistic missiles; leverage technological strengths; and build strategic NATO-Russia partnership against common weapons of mass destruction threats. In addition to influencing BMD through cooperation, Russia could also face genuine threats from rogue states and could benefit from BMD technology sharing. For further discussion, see Oksana Antonenko, "Prospects for NATO-Russia Missile Defense Cooperation," Valdai Club, May 26, 2011.

24. Ibid.

future capabilities, mercurial bilateral relations, and respective electoral cycles. But to advance, NATO and Russia must also first reconcile the purpose of a cooperative BMD arrangement, beyond just a single third-party threat. In this regard, a lack of political will and bureaucratic inertia remain the greatest hurdles.

First, shared efforts on a threat assessment on Iran, a joint data exchange center, and joint BMD exercises are important building blocks.²⁵ Second, the dispute over what cooperative BMD system to build might be resolved by allowing each side to defend its own territory, but with allowances for double protection for some countries near the boundary.²⁶ Third, it should be agreed on at the highest levels that BMD Phase IV will deploy in light of the progress of Iran's nuclear weapons program. This is important because Russia is most concerned by Phase IV, in part because it is yet not clear how exactly it will develop in terms of technical specifications. Such initiatives are important for building confidence, reducing tensions associated with BMD deployment, inducing wider cooperation such as with a follow-on to New START or efforts to contain Iran, and helping to counter those in Russia who inflate the BMD threat and seek unnecessary responses such as the new heavy, liquid-fueled ballistic missile.

It would be a lost opportunity if Russia did not take part in some arrangement. Indeed, experts assert that some form of BMD cooperation could have a transformative effect on United States / NATO–Russia relations. But Russian demands for joint BMD and binding U.S. guarantees that BMD will never potentially threaten Russia are a non-starter. At the core, cooperation must satiate Russia's desire to be viewed as an equal partner with the United States and NATO. Indeed, experts posit that, among the members of the Russia's leadership, interest in real BMD cooperation and Western concerns for Iran's nuclear program are secondary to their interest in Russia being recognized as a power with which to be reckoned. Although it is not yet clear how BMD will evolve or how Russia will respond, it is likely that Russia will strike a balance between being viewed as an equal and opposing BMD as long as possible in order to gain concessions in exchange for its support on this issue that is so important to the West.

Conclusion: Challenges and Opportunities

Notwithstanding a radical shift, current international security conditions are conducive to further cooperation with Russia on nuclear disarmament. Russia is serious about its commitment to disarmament, but in modest steps. Russia will spin out disarmament

25. One idea is a NATO-Russia center to integrate and assess data from their early warning radars and space sensors. Present technology allows this to be done virtually with an electronic link between Russian and NATO command posts. A center manned jointly by personnel working side by side as well as joint training exercises and tests in the missile defense area will increase transparency about BMD and trust between Russia and NATO. Longer term, NATO and Russia could develop a joint protocol to guide respective officers in their separate decisions on launching missile interceptors. See Madeleine Albright and Igor Ivanov, "Moving Ahead on Reducing Nuclear Arms," *New York Times*, April 6, 2011.

26. Antonenko, "Prospects."

talks for as long as possible, so as to maximize their political benefit, but will never completely disarm. This is largely because nuclear arms are the key to its “seat” at the great powers’ table, and because it will have nuclear weapons not only as long as other states do but also to compensate for the glaring inadequacies of its conventional forces. In this sense, a credible deterrent will also remain Russia’s insurance policy against aggression from a conventionally superior foe.

Russia will also be a participant in the process of working toward nuclear disarmament not because it necessarily supports its aims but rather because it represents an opportunity to showcase its role as a major nuclear power and because disarmament is in line with its treaty obligations, military-industrial capacity, and force obsolescence. Its support for nuclear disarmament will also induce emerging nuclear states, such as China, to keep their arsenals at respectable levels and incentivize other states to not build their own nuclear weapons. At the same time, there is still room for significant but equal U.S.-Russian strategic nuclear weapons reductions. China offers a vivid example: It has a relatively small nuclear force, and no country thinks about launching a nuclear strike against it.²⁷ In this sense, experts posit that Russia will, over time, become similar to a hybrid of France and China—a more predictable second-tier power with a much smaller nuclear arsenal but that does not abide by foreign prerogatives. And even when Russia has fewer nuclear weapons, its interests will still receive attention and consideration.

Further strategic arms reductions below New START levels will be especially difficult and will depend on U.S. and Russian concessions and collaboration that will likely not be advanced until a second Obama term or until a new U.S. president is elected.²⁸ Efforts, however, will be hindered by members of the U.S. Congress who oppose arms control, portions of Russia’s military who undermine ties by misrepresenting BMD, and Russian fears that its deterrent will no longer suffice against China’s nuclear arsenal. Although Russia has called on engaging other nuclear states—implicitly referring to China—in arms control, this concept is not yet practical, given that it would complicate U.S.-Russian reduction efforts. Furthermore, it is not yet feasible given differing security needs and the disparate sizes and types of their nuclear arsenals. Experts argue that engaging China eventually on arms control will be beneficial and is likely to begin within a decade following further U.S. and Russian force obsolescence and treaty-induced reductions.

Talks on a U.S.-Russian nonstrategic nuclear forces reduction treaty would be the logical next step. But the United States and Russia will need to (1) define what weapons are nonstrategic (this should not be a major hurdle given existing definitions under the Intermediate-Range Nuclear Forces Treaty and START); (2) exchange data on the number, type, and location of existing weapons and those eliminated since each country

27. Y. Bazhanov, “When Fewer Nuclear Arms Means More Security,” *Moscow Times*, February 17, 2011, <http://www.themoscowtimes.com/opinion/article/when-fewer-nuclear-arms-means-more-security/431169.html>.

28. For further discussion, see Micah Zenko, “Toward Deeper Reductions in U.S. and Russian Nuclear Weapons,” Council on Foreign Relations, November 2010, http://i.cfr.org/content/publications/attachments/US-Russia_Nuclear_CSR57.pdf.

announced in 1991 and 1992 that it would take unilateral steps to destroy thousands of NSNFs; and (3) discuss how to store such arms with a view to design an effective verification regime.²⁹ Both sides also need to reduce the number of stored warheads (their “hedge”), which are much more than those needed as replacements in case of cheating or failure in deployed warheads.³⁰ Progress on limiting conventional forces in Europe would facilitate NSNF talks, because if the United States and Russia can agree that their nuclear and military forces do not threaten one another, they will be more inclined to limit them. Meaningful progress, however, will require trade-offs between U.S. and Russian concessions, including the withdrawal of the small number of U.S. tactical weapons remaining in Europe.³¹ The United States should also encourage Russia’s military reforms and efforts to develop effective conventional weapons to reduce Russian dependence on nuclear weapons to deter regional threats and less probable NATO threats.

The window for BMD cooperation, and thus the litmus test for the future of U.S.-Russian nuclear cooperation, is closing. Fortuitously, the leaderships in both countries are sincerely interested in making progress, but important political impediments remain. From a security perspective, Russia does not need or necessarily want BMD. Hence, cooperation should aim at ameliorating Russia’s concerns with BMD and satiating its need to be viewed as a global power and partner of the United States. Cooperation would radically change the nature of United States / NATO–Russia relations, but is a difficult endeavor. But this is precisely what is needed—to move away from the still-adversarial relationship toward a more cooperative one. Although there are well-grounded reservations about BMD’s effectiveness, institutionalized and substantive cooperation in this field would help transform ties to one of combating common threats, including emerging missile states.³² Experts argue that as the stronger partner with a superior military, the United States can afford to be more accommodating to Russian concerns, especially regarding BMD. This approach is in line with historical U.S. efforts to break the inertia of negative trends in ties, such as the current “reset” policy.

BMD cooperation would also encourage Russia to reduce the role and size of its strategic forces and ameliorate its inclination to develop more advanced penetrating capabilities, such as the heavy, liquid-fueled MIRVed missile. This missile, which has no other military rationale and will likely be plagued with development problems, will be seen as a Cold War–like challenge to the West and will inhibit further discussion on other pressing issues. And it is important that it will further complicate arms control negotiations and make further reductions of strategic arsenals more difficult.³³ In particular, a

29. Albright and Ivanov, “Moving Ahead.” See also Brookings Institution, “Salvaging the Conventional Armed Forces in Europe Treaty Regime: Options for Washington,” March 2010, http://www.brookings.edu/~media/Files/rc/papers/2010/03_armed_forces_europe_treaty/03_armed_forces_europe_treaty.pdf.

30. “The Next Arms Treaties,” *New York Times*, December 31, 2010, <http://www.nytimes.com/2011/01/01/opinion/01sat1.html>.

31. “Reducing Tactical Nuclear Weapons.”

32. Simon Saradzhyan, “A Silver Bullet for the Reset,” *Moscow Times*, March 28, 2011, <http://www.themoscowtimes.com/mobile/article/433956.html>.

33. Pavel Podvig, “Russia’s Nuclear Forces: Between Disarmament and Modernization,”

new Russian MIRVed ICBM program would raise questions in the United States, which is moving toward de-MIRVing its land-based ballistic missiles, and could be seen as a destabilizing development in the strategic relationship.³⁴ Conversely, in Russia, it is de-MIRVing that is often seen as a threat to stability, because it gives the United States the capacity to quickly increase the number of warheads carried by its ballistic missiles (i.e., its upload potential).³⁵

In conclusion, it would behoove NATO and the United States to consult and be more transparent with Russia on all sensitive aspects of their relationships, such as conventional prompt global strike capabilities, so as to assuage Russia's need to be seen as an equal to the United States and counter those both inside and outside Russia who seek to undermine relations. Though the United States and NATO do not have to consult Russia or take its concerns into account—and indeed they often do not—it ultimately serves their interests to do so.

Proliferation Papers, no. 37, Spring 2011, 11.

34. Ibid.

35. Ibid.

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