

7

October 2009

Center for the Study of Weapons of Mass Destruction

# Countering Weapons of Mass Destruction: Looking Back, Looking Ahead

by Paul I. Bernstein,  
John P. Caves, Jr.,  
and W. Seth Carus

occasional paper

**Center for the Study of Weapons of Mass Destruction**  
National Defense University

Since its inception in 1994, the Center for the Study of Weapons of Mass Destruction (WMD Center) has been at the forefront of research on the implications of weapons of mass destruction for U.S. security. Originally focusing on threats to the military, the WMD Center now also applies its expertise and body of research to the challenges of homeland security. The center's mandate includes research, education, and outreach. Research focuses on understanding the security challenges posed by WMD and on fashioning effective responses thereto. The Chairman of the Joint Chiefs of Staff has designated the center as the focal point for WMD education in the joint professional military education system. Education programs, including its courses on countering WMD and consequence management, enhance awareness in the next generation of military and civilian leaders of the WMD threat as it relates to defense and homeland security policy, programs, technology, and operations. As a part of its broad outreach efforts, the WMD Center hosts annual symposia on key issues bringing together leaders and experts from the government and private sectors. Visit the center online at [www.ndu.edu/WMDCenter/](http://www.ndu.edu/WMDCenter/).

For additional information, including publication requests, please contact the Center directly at [WMDWebmaster@ndu.edu](mailto:WMDWebmaster@ndu.edu) or (202) 685-4234 or visit the Center Web site at <http://www.ndu.edu/wmdcenter/index.cfm>



**Countering Weapons of Mass Destruction:  
Looking Back, Looking Ahead**



# Countering Weapons of Mass Destruction: Looking Back, Looking Ahead

*by* Paul I. Bernstein,  
John P. Caves, Jr.,  
and W. Seth Carus

*Center for the Study of Weapons of Mass Destruction  
Occasional Paper 7*



National Defense University Press  
Washington, D.C.  
October 2009

Opinions, conclusions, and recommendations expressed or implied within are solely those of the contributors and do not necessarily represent the views of the Defense Department or any other agency of the Federal Government. Cleared for public release; distribution unlimited.

Portions of this work may be quoted or reprinted without permission, provided that a standard source credit line is included. NDU Press would appreciate a courtesy copy of reprints or reviews.

First printing, October 2009

NDU Press publications are sold by the U.S. Government Printing Office. For ordering information, call (202) 512-1800 or write to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. For the U.S. Government On-Line Bookstore go to: [http://www.access.gpo.gov/su\\_docs/sale.html](http://www.access.gpo.gov/su_docs/sale.html).

For current publications of the Institute for National Strategic Studies, consult the National Defense University Web site at: <http://www.ndu.edu>.

# Contents

Acknowledgments .....	ix
Looking Back .....	1
The Clinton Years .....	1
The Bush Combating WMD Strategy .....	5
Why Have We Not Been Attacked with WMD? .....	12
Looking Ahead .....	15
Nuclear Proliferation Challenges .....	15
Chemical and Biological Proliferation Challenges .....	28
The Obama Administration: Initial Observations .....	37
Conclusion .....	45
Notes .....	49
About the Authors .....	53





# Acknowledgments

This occasional paper from the Center for the Study of Weapons of Mass Destruction (WMD Center) at the National Defense University (NDU) examines the evolution of U.S. perceptions of the WMD threat and major responses to that threat from the Clinton administration to the first few months of the Obama administration. It also considers why our worst fears for WMD use and proliferation have not been realized and anticipates some of the major WMD challenges that lie ahead.

An important basis for the paper is the presentations and discussions conducted during the WMD Center's eighth annual symposium, *WMD Proliferation and Use: Have We Been Effective, Lucky, or Overly Concerned?* held at NDU May 7–8, 2008. While all symposium sessions were off the record and all comments delivered on a nonattribution basis, the authors wish to thank the many speakers and panelists for their contributions to that event and, hence, to this paper. In particular, the WMD Center thanks the Honorable Michael Chertoff, then Secretary of Homeland Security, and the Honorable Ellen O. Tauscher, then U.S. Representative and Chairman, Subcommittee on Strategic Forces, Committee on Armed Services, U.S. House of Representatives, for delivering the symposium's keynote addresses. The WMD Center also expresses its appreciation to the symposium's other key participants: Colonel H. David Belote, USAF, Ambassador J.D. Crouch II, Mr. Robert J. Einhorn, Ms. Jane Fletcher, Mr. Brian Green, Ms. Rebecca K.C. Hersman, Ms. Laura S.H. Holgate, Ambassador Robert G. Joseph, Ambassador Donald A. Mahley, Ms. Patricia McNerney, Dr. James N. Miller, Dr. John Mueller, Dr. Michael Nacht, Mr. Vayl Oxford, Dr. James B. Petro, Dr. Barry R. Posen, Dr. Brad Roberts, Dr. James A. Tegenelia, Dr. Tara O'Toole, Mr. Robert Walpole, and Lieutenant General Frances C. Wilson, USMC.

The authors would like to acknowledge Dr. John F. Reichart and Ambassador Greg Schulte for their helpful comments on the paper.



## Looking Back

Nearly 20 years have passed since the United States began worrying in earnest about the risks of regional weapons of mass destruction (WMD) proliferation. In the run-up to Operation *Desert Storm* in 1990, the Department of Defense (DOD) had no systematic understanding of or approach to prosecuting a regional war against an adversary armed with and prepared to use nuclear, biological, or chemical weapons. The improvisational efforts to prepare for possible Iraqi WMD use gave way after the war to a concerted effort during the Bill Clinton administration to prepare the Armed Forces to confront WMD-armed regional adversaries, while working to defuse such threats through diplomacy—coercive and otherwise. The George W. Bush administration brought to the WMD problem a different set of assumptions and beliefs that led to new areas of emphasis and new approaches, many of them shaped by the need, after the attacks of 2001, to confront more directly the threat of WMD use by violent nonstate actors. The following traces the general evolution of the countering WMD enterprise in the Clinton and Bush administrations.

### The Clinton Years

The Clinton administration saw proliferation as a growing danger, and the need to make nonproliferation a higher priority was a common theme in both formal policy statements and the President's public remarks. But proliferation was also a policy imperative to be integrated into the administration's larger vision of achieving stability through economic expansion, globalization, and democratization. The administration's first major policy statement on nonproliferation was explicit in articulating this linkage, offering three principles to guide policy:

- Our national security requires us to accord higher priority to nonproliferation and to make it an integral element of our relations with other nations.
- To strengthen U.S. economic growth, democratization abroad, and international stability, we actively seek expanded trade and technology exchange with nations, including former adversaries, that abide by global nonproliferation norms.
- We need to build a new consensus—embracing the executive and legislative branches, industry and public, and friends abroad—to

promote effective nonproliferation efforts and integrate our non-proliferation and economic goals.<sup>1</sup>

It was a core belief of the President and his advisors that security and economics were intertwined and that security and global influence were deeply dependent on continued economic vitality and accelerated engagement with the global economy. With respect to WMD, the continuing challenge was how to build a system of increasing pressures against proliferation within a world of increasingly open trade and technology. As an example, the need to balance economics and security directly influenced efforts to reshape Cold War-era export controls that were viewed as placing unfair burdens on legitimate commerce and being overly focused on former adversaries.<sup>2</sup>

Within this broad framework, Clinton administration policy demonstrated a strong commitment to traditional nonproliferation strategies as well as recognition of new WMD challenges requiring different approaches. With regard to the former, the Clinton team inherited from the administration of George H.W. Bush an agenda aimed at strengthening the international nonproliferation treaties regime. To further advance this agenda, the Clinton administration secured ratification of the Chemical Weapons Convention (CWC) and an indefinite extension of the nuclear Non-Proliferation Treaty (NPT), negotiated (but failed to secure ratification of) a Comprehensive Test Ban Treaty, and continued efforts to strengthen the Biological and Toxin Weapons Convention (BWC).<sup>3</sup>

There were also new problems to which the international treaty regime was less responsive. These demanded attention, and in the Clinton years significant effort was devoted to managing three critical proliferation challenges that promised to create serious new dangers if not contained: “loose nukes” that might emanate from the former Soviet Union, rogue state WMD programs and capabilities, and the prospect of WMD terrorism. These challenges were uniquely post-Cold War in character and were closely related. The vast Soviet enterprise—materials, technology, expertise—that during the Cold War produced countless weapons of mass destruction to be used against the United States and its allies could now plausibly become a source of WMD capability for hostile states or even terror organizations with the necessary means. Implementation of the centerpiece Nunn-Lugar legislation and its various offspring in the Departments of State and Energy for cooperative threat reduction became a major nonproliferation focus of the Clinton administration, which argued that these programs were “defense

by other means”—as valuable as many other programs in the defense budget in their contribution to managing security threats.<sup>4</sup> And in fact new DOD organizations and budget authorities were created to manage cooperative threat reduction activities.

In parallel, DOD civilian leadership sought to integrate the threat posed by WMD into all aspects of its planning and operations. While the United States and coalition forces did not confront Iraqi WMD on the battlefield in Operation *Desert Storm*, an important lesson from the war was that such weapons could be an important feature of future conflicts against motivated rogue states. The discovery in the postwar period of how aggressively Iraq had been pursuing WMD served to underscore this lesson, as did the emerging crisis over North Korea’s nuclear program. The administration hoped to deal decisively with these problems through various forms of coercive diplomacy—the Agreed Framework with North Korea and the containment strategy vis-à-vis Iraq—but prudent defense planning demanded that U.S. Armed Forces be prepared to fight these adversaries on a WMD battlefield.

It was a core belief of Secretary of Defense Les Aspin and his deputies that WMD could be a decisive obstacle to prevailing at acceptable cost in regional wars. If the keys to victory in such wars were U.S. political will to prevail and its overwhelming conventional advantage in power projection and warfighting, then it was essential to make sure these were not put at risk by a rogue state’s asymmetric WMD capability. Therefore, countering this threat needed to be a central thrust of defense planning. Thus was born the Defense Counterproliferation Initiative (DCI) in December 1993. Unveiling this initiative to a Washington, DC, audience, Aspin explicitly recognized the limitations of a strategy based solely or largely on nonproliferation treaties, export controls, and diplomacy, and characterized the DCI as “making the essential change demanded by this increased threat . . . adding the task of protection to the task of prevention.”<sup>5</sup>

The DCI motivated a number of important developments. Notable among these were:

- a series of studies and analyses to gain a stronger and more detailed understanding of the WMD technical threat and the operational impact of WMD use on the execution of war plans, focused largely on chemical and, to a lesser extent, biological threats
- a more systematic and better resourced approach to define requirements and acquire capabilities for both passive and active

defense, and the means to destroy an adversary's WMD weapons and infrastructure (widely referred to as *counterforce*)

- consolidation of all proliferation-related policy functions in the Office of the Secretary of Defense under a single Assistant Secretary, and consolidation under a single Deputy Assistant Secretary of counterproliferation and contingency/war planning functions
- development of a standalone counterproliferation concept plan as guidance to the regional commands
- creation of cooperative counterproliferation activities with allies and security partners, including major initiatives in the North Atlantic Treaty Organization, Persian Gulf region, and East Asia.

In these dimensions, the effort to integrate the WMD threat more directly into defense planning gained some traction and laid the foundation for more ambitious planning and organizational developments in the post-Clinton period. However, the avowed goal of civilian policymakers to “institutionalize counterproliferation as an organizing principle in every facet of military activity” was perhaps never a realistic one.<sup>6</sup>

The counterproliferation initiative recognized the potential for WMD terrorism, but was concerned principally with preparing for conflict with a WMD-armed state. By 1995, the combined impact of the first attack on the World Trade Center, the bombing of the Murrah Federal Office Building in Oklahoma City, and the Aum Shinrikyo sarin gas attack in Tokyo was elevating anxiety about terrorists acquiring and using unconventional weapons. Soon after, senior national security officials were speaking openly about WMD terrorism as a major concern.<sup>7</sup> At the highest level, the Clinton administration sought to put in place a framework for organizing the Federal Government's efforts to prevent and respond to acts of terrorism designed to create mass casualties or mass disruption. A Presidential Decision Directive (PDD), “U.S. Policy on Counterterrorism,” was issued in June 1995. It gave high priority to developing capabilities to counter WMD terrorism, directed a lead agency approach for responding to both domestic and overseas terror incidents, and called for coordination between crisis and consequence management agencies in resolving a WMD terrorist incident.<sup>8</sup> This framework was updated and expanded in May 1998 in PDD-62 (“Combating Terrorism”) and PDD-63 (“Critical Infrastructure Protection”). PDD-62, according to an unclassified White

House fact sheet, clarified and strengthened the roles and responsibilities of key agencies and established the Office of the National Coordinator for Security, Infrastructure Protection, and Counter-Terrorism to oversee interagency efforts.<sup>9</sup> PDD-63, which was unclassified, built on the recommendations of the President's Commission on Critical Infrastructure Protection. It established a new national-level structure to redress identified infrastructure vulnerabilities and set goals for enhanced protection.

In responding to an act of WMD terrorism, the Defense Department would have significant capabilities to contribute—though it was not clear that sufficient units, assets, and expertise existed to support a robust response to both a domestic terror event and an overseas warfighting contingency involving WMD. This possibility, even if it may have appeared remote to some, raised concerns about high demand/low density assets that continue to be heard today.

### **The Bush Combating WMD Strategy**

George W. Bush and his national security team were, by and large, skeptics with respect to traditional disarmament diplomacy and bi- and multi-lateral arms control. They believed developments in the 1990s validated this skepticism. The NPT regime had been ineffectual in confronting important cases of noncompliance, allowing rogue state nuclear programs to advance and contributing to a growing crisis of confidence in the treaty. The BWC established a useful norm, but the measures being negotiated to strengthen it could not ensure compliance and could disadvantage both biodefense activities and the commercial interests of U.S. industry. In both the nuclear and biological cases, it was not clear that cumbersome treaty-based systems could keep pace with and adapt to the increasingly dynamic processes by which advanced technologies were spreading around the globe. The Anti-Ballistic Missile (ABM) Treaty was obstructing U.S. ability to develop effective missile defenses. A new strategic relationship with Russia argued against negotiating another arms control agreement such as the Strategic Arms Reduction Treaty (START). North Korea could not be trusted to abide by the 1994 Agreed Framework, and the cooperative threat reduction (CTR) programs perhaps had outlived their usefulness.

It is difficult to say precisely what course Bush administration policy would have taken had the attacks of September 11, 2001, and the subsequent anthrax attacks not occurred. It seems clear, though, that the salient prospect of catastrophic terrorism led the President to conclude that a comprehensive campaign against WMD proliferation was imperative. The reasoning was straightforward: more proliferation only increased



the chances that WMD would fall into the hands of terrorists bent on horrific violence. In particular, the state programs of hostile proliferators could not be allowed to become a source of WMD for terrorists. Ambiguity about these programs—something that might have been tolerable before 9/11—could no longer be accepted; they needed to be rolled back or prevented from reaching their goal. It was not enough to contain and deter state proliferators. Deterrence was challenging enough and a far from certain prospect given that rogue state leaders could be high risk-takers and prone to miscalculation. But even if leaders in Baghdad, Pyongyang, and Tehran could be deterred from using their WMD against the United States or its allies, how could they be dissuaded from passing WMD knowledge and technology—and perhaps even weapons—to terror groups sharing a profoundly anti-American agenda?

Faced with this set of dangers, emphasis would now be on a proactive strategy to address the gathering threat posed by those possessing or seeking WMD—in particular, those seemingly intent on acquiring nuclear weapons capability. The 2002 *National Security Strategy of the United States of America* (NSS) put it plainly: “The United States can no longer rely solely on a reactive posture as we have in the past. . . . We must adapt the concept of imminent threat to the capabilities and objectives of today’s adversaries. . . . The United States will, if necessary, act preemptively.”<sup>10</sup> The so-called preemption strategy, rightly or wrongly, came to define for much of the world the whole of U.S. foreign and defense policy, which was widely caricatured as reckless and unilateralist. Viewed in less emotional terms, the NSS signaled an aggressive search for a stronger and more diverse set of tools with which to fight an increasingly complex problem.

The *National Strategy to Combat Weapons of Mass Destruction* (NS–CWMD), issued just 3 months later, offered a more detailed framework for developing this toolkit. The use of the term *combating WMD* reflected an effort to overcome continuing contention over the primacy to be accorded nonproliferation and counterproliferation as planning paradigms. The document outlined a comprehensive strategy in which both nonproliferation and counterproliferation were critical pillars (along with a third, consequence management). An attempt to motivate the entire U.S. Government to develop counter-WMD strategies and to demonstrate to a larger audience that U.S. strategy was balanced in its emphasis on both “active nonproliferation diplomacy” and military preparedness, the NS–CWMD made only one reference to the potential need to act preemptively and otherwise steered clear of the controversy that had accompanied the earlier NSS.

Through these early strategy documents, as well as contemporaneous and subsequent policy decisions, one can discern a number of core ideas that help to define the Bush approach to combating WMD:

- WMD are the object of strategy. No longer simply an impediment to military operations, WMD represent a systemic threat to U.S. security and therefore are now the strategic objective itself. This requires attacking the problem much closer to its source—before it confronts us as a strategic or operational threat. The emphasis must be on creating opportunities and the means to prevent proliferation and attack the proliferation process itself.
- Strengthen the international nonproliferation regime where possible, but develop a complementary framework for collaborative action outside the regime. Reforming and strengthening the international treaty regime are important, but are not enough. Equally if not more vital are new approaches outside the regime that are focused less on making and enforcing rules and more on practical cooperation with security partners aimed at building political will and operational capacity.
- The responsible exercise of sovereignty is critical. States must act on their responsibilities, not simply seek to leverage their rights in the international system. And all states with a stake in containing the WMD threat have an obligation to fight proliferation on their own territory, in the global commons, through formal collective security mechanisms, and as part of “coalitions of the willing.”<sup>11</sup>
- Deal with the “WMD world” as it is: a complex, diverse landscape. Combating WMD policy must be rooted in political reality and an objective assessment of what is possible. The United States cannot avoid distinguishing between friend and foe and between states that behave well and those that do not. States need to be treated accordingly, even if this makes it more difficult to promote universal nonproliferation principles. The character of regimes counts, and sometimes behavior is as important as rules. And as a global power, the United States cannot look at combating WMD in isolation. At times, broader regional or geopolitical goals may demand higher priority.<sup>12</sup>

In practice, Bush administration policy emphasized four major thrusts.

**Tighten the NPT.** The need to shore up the NPT regime was first articulated by the President in remarks at the National Defense University in February 2004.<sup>13</sup> Citing the progress that states such as Iran appeared to be making in developing weapons-related capabilities under cover of ostensibly peaceful nuclear programs, the President called for a “safe, orderly system to field civilian nuclear power plants without adding to the danger of weapons proliferation.” Specifically, he proposed that in return for reliable, affordable access to civilian reactor fuel, states without existing full-scale enrichment and reprocessing capabilities renounce such capabilities, and that the rules governing nuclear trade be revised accordingly. He also called for strengthening the inspection capabilities of the International Atomic Energy Agency (IAEA). The proposal to limit the further spread of enrichment and reprocessing technology recognized that the NPT “loophole” had become the center of gravity of the nuclear proliferation problem, and that new approaches to the nuclear fuel cycle were required—especially given projections of significant global growth in nuclear power. Two years later, in February 2006, the administration unveiled the Global Nuclear Energy Partnership (GNEP), an ambitious initiative to advance the goal outlined by the President. The GNEP aimed, among other things, to create a market-driven fuel services program to provide civilian reactor fuel, and to develop proliferation-resistant technologies to recycle spent fuel. While GNEP has generated some interest at the international level, significant issues have been raised about both its technical and political elements.

**Create an International Partnership Network.** Recognizing the limits to institutional reform of the nonproliferation regime and looking for more flexible tools grounded in political consensus rather than legally binding undertakings, the administration introduced a number of initiatives it hoped would be responsive to the unique challenges posed by relatively new problems, such as sophisticated WMD black markets and WMD terrorism. The goal was to create a framework for action among likeminded states.<sup>14</sup> The first of these, the Group of Eight Global Partnership against the Spread of Weapons and Materials of Mass Destruction (2002), built on existing cooperative threat reduction programs to increase Western funding for such activities. The Proliferation Security Initiative (2003), which focused on interdicting illicit trafficking in WMD, and the Global Initiative to Combat Nuclear Terrorism (2006) were often cited by administration officials as signaling a markedly new approach to international cooperation. By design, these initiatives were

organized not around large, standing bureaucracies or secretariats, but rather around a set of actionable principles, arrived at by political consensus, to enable concrete steps to reduce the WMD threat and increase the capacity of states to act.

Other initiatives, such as targeted measures directed at the financial flows that facilitate proliferation, sought to create new forms of international leverage against specific problem states. Still others, such as United Nations Security Council (UNSC) Resolution 1540 (2004), created an obligation and provided a universal framework for all states to develop the means—in physical protection, materials control, criminal law, and export, border, and financial controls—to prevent and counter proliferation activities on their own territory. Weak governance and weak laws were too easily exploited. Discovering that many countries lack established legal frameworks to deal with WMD and terrorism reinforced administration thinking, dating to 9/11 if not earlier, that national and international law needed to be made more responsive to the new threats posed by WMD and nihilistic terrorism.<sup>15</sup>

***Roll Back or Contain Rogue State Programs.*** This was undoubtedly the most contentious aspect of Bush administration policy, often exposing serious divisions among senior advisors in the search for an effective formula for tackling the rogue state problem. The 2002 National Strategy to Combat WMD had explicitly called for country-specific strategies, and in some cases, such as Iraq and Libya, policy consensus appears to have been achieved fairly easily. Consensus on the harder cases of North Korea and Iran proved far more elusive, pitting “purists” against “pragmatists” and “neocons” against “realists” in the battle for policy dominance. There were at least three approaches to rollback in the Bush years: regime change through preventive war, traditional coercive diplomacy, and what may be called “strategic cooperative disarmament.”

Preventive war to oust the Saddam Hussein regime was justified based on the gathering threat of Iraqi WMD and the belief at the highest levels of the administration that coercive diplomacy had run its course. In this sense, it was the first “counterproliferation war,” a faithful expression of the 2002 National Security Strategy, and an action that the administration hoped would signal to other rogue states the U.S. determination to act decisively against radical threats. As the United States became ensnared in Iraq, however, it seemed just as likely that these states would see Washington as less able to pursue strategies that implicitly or explicitly threatened military action—and would therefore be emboldened to resist international pressures to limit or roll back their WMD capabilities.

The case of Libya comes closest to expressing the “strategic cooperative disarmament” ideal posed by the administration in its January 2003 document, “What Does Disarmament Look Like?”<sup>16</sup> This White House paper, produced in the run-up to Operation *Iraqi Freedom*, described successful cooperative disarmament as a strategic decision made by the highest level leadership to voluntarily and transparently surrender WMD through a dedicated organizational mechanism subject to cooperative international verification. The animating thought behind this construct was that commitments made by states under duress or through coercion are not reliable and will not be honored. Put differently, coercive diplomacy built around an adversarial bargaining process will ultimately prove quixotic. Intended to set a standard for Iraqi behavior in complying with UN resolutions, this document more closely describes the process leading to Libya’s decision in December 2003 to dismantle its WMD and missile programs. Thereafter, this process was frequently touted by administration officials as a model for dealing with rogue state WMD programs.

Realistically, it was not a model that could be applied to the tougher challenges posed by a more determined North Korea and Iran. In determining how to deal with these countries, the basic choice seemed to be between confrontation and engagement (that is, negotiation). With respect to North Korea, the dominant view in the President’s first term—that we simply could not negotiate with Pyongyang—gave way in the second term to a process of “carrot and stick” diplomacy that leveraged the influence, notably, of China, but also involved other key regional players (Japan, South Korea, and Russia). This process led first to the Six-Party Agreement of September 2005 and then, in the aftermath of North Korea’s nuclear test of October 2006, the Initial Actions Agreement of February 2007. At the time President Bush left office, there was still no follow-on agreement with North Korea regarding how to verify its nuclear dismantlement activities. Thus, decisive progress remained elusive—no doubt validating for some the idea that bargaining with Pyongyang will never yield a satisfactory outcome.

Similarly, policy toward Iran evolved from a largely confrontational stance in the early years to a more traditional form of coercive diplomacy. In return for suspending enrichment and reprocessing-related activities, Western powers offered Tehran a range of economic, political, and security benefits. The alternative was to face increasing international isolation and pressure. Unwilling to talk directly to the Iranian regime absent a suspension of enrichment, Washington ceded the negotiating lead to its European allies, but did offer high-level diplomatic engagement once

meaningful progress had been made. The coercive element of this strategy emphasized UNSC sanctions (three rounds beginning in 2006) and U.S. unilateral sanctions, but also included the threat of military action to deny Iran a nuclear weapons capability. Neither the “carrots”—increasingly attractive incentives—nor the “sticks”—increasingly watered-down sanctions—were successful in moving the Iranians, who seemed intent on playing for time while expanding their capacity to produce nuclear material. By the time the Bush administration left office, many experts had concluded that Iran had accumulated enough low-enriched uranium (LEU) to support fabrication of at least one nuclear weapon if the LEU were to be enriched to weapons grade.<sup>17</sup>

**Improve Defense Preparedness.** There were few radical changes in the Bush approach to defense planning for the WMD threat. One notable exception was the strong commitment to accelerate the development and deployment of a layered ballistic missile defense (BMD) system, especially a “national missile defense” capability to provide some degree of protection to the homeland from long-range missiles that could originate from North Korea or Iran. This commitment led to abrogation of the ABM Treaty, an aggressive research, development, test, and evaluation (RDT&E) program launched in 2001, a significant increase in funding for missile defense activities, and a Presidential decision in December 2002 directing early deployment of an initial capability to defend the United States against limited missile attacks. This initial operational capability was fielded in late 2004, and while it has since improved, questions persist about its likely effectiveness.

In addition, since 2005 there has been a concerted effort to better conceptualize and organize combating WMD as a DOD mission. In January 2005, U.S. Strategic Command was designated “lead combatant commander” for combating WMD, charged with “integrating and synchronizing” all DOD activities in this area and being the principal warfighter advocate for supporting capabilities. In February 2006, the *National Military Strategy for Combating WMD* outlined major strategic objectives as well as eight military mission areas ranging from security cooperation to consequence management—including missions reflecting the growing importance of WMD interdiction and WMD elimination (the latter based on the experience of Operation *Iraqi Freedom*). In parallel, a global concept plan for combating WMD was produced as a common planning template for the regional commands. A series of capabilities-based assessments was performed to support the development and advocacy of requirements.

These and related steps were taken to create greater unity of purpose and effort within DOD, and some progress toward this goal was achieved—although concerns persist that DOD combating WMD activities remain insufficiently integrated, and that combating WMD requirements remain insufficiently competitive in the resource allocation process. In particular, U.S. Strategic Command’s mandate to integrate and synchronize has translated into less capacity to guide and direct WMD developments within the department, and thus with other departments and agencies, than those terms suggest. This situation reflects, in part, a collective inability to achieve a commonly accepted understanding of what is meant by “integrate and synchronize,” which itself may be symptomatic of regional combatant command reluctance to cede a measure of control over operational planning to a functional combatant command. It may have been unrealistic to expect that any command, at least one lacking the dedicated forces and special authorities of U.S. Special Operations Command, could exercise this kind of leadership in a specialized area over other commands and DOD components. If U.S. Strategic Command, or another DOD component, is to exercise a more effective role in coordinating and enhancing U.S. military, and interagency, operational readiness for WMD contingencies, it will need a more clearly defined writ as well as active support from the Office of the Secretary of Defense (OSD) and Joint Staff. Otherwise, the Joint Staff may need to assume this role directly.

Summing up, this initial review of the Bush strategy to contain the spread of WMD points to a mixed picture. The effort to recast U.S. strategy to rely less overall on international institutions and traditional disarmament diplomacy and more on practical cooperation with security partners led to policy innovation and a more diverse toolkit. To some degree, this has altered the dynamics of global cooperation in non- and counter-proliferation. The effort to roll back rogue state proliferation generated a variety of strategies but produced uneven results, at best.

### **Why Have We Not Been Attacked with WMD?**

A parallel set of issues grows out of the Bush administration’s efforts to harden the Nation against WMD attack, whether by a state adversary or a terror organization—or some combination of the two. Here, an important question goes to the value and cost-effectiveness of the huge investment made since 9/11 in homeland security: Why has the United States not been attacked with WMD?

There are competing explanations for why the United States has not suffered a major WMD attack. For some, this is evidence that the threat

has been overstated: “the dog that did not bite.” For others, it is some combination of luck and the impact of strategies and policies put in place over the last several years that have been effective in containing the threat and thwarting attacks. Contention over these two perspectives is almost inevitable when confronting “low probability/high consequence” challenges, as WMD terrorism is often characterized.

Those who view WMD dangers as exaggerated see both the broader terrorism threat, as well as the specific risk of WMD terrorism, as overstated. Citing various specialists, they make a number of arguments:

- The jihadist phenomenon has evolved into something inherently self-limiting and decreasingly coherent as an instrument of transnational violence. This is largely because the most committed and competent cadre has been significantly depleted and the only part of the movement that is growing is a leaderless collection of “terrorist wannabes” dispersed across cyberspace with limited, if any, operational capability.<sup>18</sup> Rather than an existential threat to the American way of life, this is a limited and manageable problem. In addition, evidence of mounting criticism within the Islamic community of al Qaeda’s extreme violence (especially against fellow Muslims) could have the effect of deterring al Qaeda from using WMD so as to avoid irreparably alienating its key constituencies. Finally, there appear to be few, if any, al Qaeda operational cells in the United States.<sup>19</sup>
- The technical obstacles to successfully planning and executing a mass casualty WMD attack remain formidable. Arguments to the contrary are the product of, as one observer suggests, sloppy thinking by analysts, the vested interests of bureaucracy and industry, and morbid fascination on the part of the media and popular culture.<sup>20</sup> Moreover, the evidence that al Qaeda is capable of overcoming these barriers has been exaggerated. The likelihood of catastrophic nuclear or biological terrorism is quite low when one considers the full range of tasks a terrorist group must successfully complete to deliver the desired effects.<sup>21</sup> Other threats, it is argued, such as natural outbreaks of infectious disease, pose a higher probability danger.
- Al Qaeda’s objective is not to destroy the United States but to instill fear and generate an overreaction that will bleed the country psychologically and economically. Unwarranted anxiety over WMD



has validated this al Qaeda strategy, leading the United States into a costly war and diverting massive sums into a set of protective policies whose overall cost-effectiveness is questionable.

- While Americans do not appear to spend a great deal of time worrying about domestic terrorism and have made few changes in their lives in response to this danger, it is nonetheless the case that terrorism and the need to wage war against it have become “fully embedded in the public consciousness.”<sup>22</sup> This prevailing consensus has fueled the growth of the homeland security enterprise, and is difficult to challenge.

By contrast, for those who believe that the consequences of successful WMD attacks against the United States are unpredictable—and potentially existential—it is simply not possible to overstate the danger, probabilities notwithstanding. The stakes are so high that worst-case planning is a prudent response. However, one need not view the threat as existential to be gravely concerned, and one need not engage in worst-case planning to make the case for substantial action across many fronts. Enough is known about the interest of radical actors in WMD and the potential consequences of well-executed attacks to warrant a significant response at all levels of government. Factor in troubling trends in areas such as nuclear energy, the life sciences, advanced chemistry, and proliferation networks, as well as the demonstrated patience with which al Qaeda plans major operations, and one can argue that the United States has not overreacted to the WMD problem, and that its investment in homeland security has been prudent—if at times inefficient.<sup>23</sup>

That is not to say that U.S. efforts to prevent, deter, defeat, and respond to WMD threats are solely responsible for the absence of a major attack. It is possible the Nation has been more lucky than effective in avoiding WMD use. In truth, it is just not possible to know all the reasons certain events have not occurred. But common sense suggests that even if aspects of the threat may have been overstated, policies and actions—imperfect as they may be—have had an impact. The challenge for decisionmakers is to assess continually which strategies, policies, and capabilities can best contribute to continued success in combating WMD, and to apply risk-based analysis to balance needed investments against other essential national security (or public health) requirements in a tight fiscal environment.

## Looking Ahead

### Nuclear Proliferation Challenges

In the 40 years since the NPT was signed, the international community's track record in managing the spread of nuclear weapons has been a good one overall. There have been successes and failures, but by controlling technology, establishing a legal-political norm against proliferation, and giving governments confidence that self-restraint is in their interest, the international nonproliferation regime has limited the spread of nuclear weapons. Today there are considerably fewer states possessing these weapons than many serious observers predicted or feared a few decades ago. However, the world is entering a period of heightened uncertainty and risk as global nuclear aspirations appear to be on the rise—exemplified not only by determined proliferators such as North Korea and Iran but also by a growing number of states that appear to be seeking to create a future nuclear option for themselves.

***Confronting “Creeping Proliferation.”*** The first eight nuclear powers were unconstrained by the NPT.<sup>24</sup> Newer nuclear aspirants are, or at least at one point were, parties to the treaty. For those determined to acquire nuclear capability, therefore, a principal challenge is simply to avoid getting caught. This means pursuing nuclear status in a way that minimizes the transparency of intent and actions. These states will either engage in treaty-compliant behavior with the intent to break out of the treaty at a later time, or undertake a covert program and hope to conceal it from international inspectors and the world. Either way, these states are likely to proceed incrementally, circuitously, and with a degree of caution, marrying technical activities that appear ambiguous to political strategies that buy time and undermine unified opposition.

Each in their own way, North Korea and Iran exemplify this model of “creeping proliferation.” Neither nation has been engaged in anything resembling a crash program to acquire nuclear weapons. North Korea began some time in the 1970s, Iran in the mid-1980s. Both proceeded under the cover of legitimate activities. Both have approached negotiating with the United States and others as a means to advance their strategic objectives at low cost. For Pyongyang, bargaining is a means to extract concessions that sustain the legitimacy of the regime while yielding as little as possible, thereby steadily raising the price for a satisfactory outcome. For Tehran, negotiations are a way to buy time for its program

to make decisive progress in mastering the technology and acquiring the materials necessary to produce nuclear weapons, should the regime choose to take this step. Thus, a process of creeping proliferation has generated a process of “creeping diplomacy”—years of diplomatic effort intended to clarify these nations’ intentions, activities, and capabilities, and to package incentives that could lead to agreed terms of limitation or rollback. This process has yielded some important but inconclusive (and now clearly endangered) progress with North Korea, but almost none with Iran. One cannot today predict with confidence that the United States and its allies will fully achieve their nonproliferation goals in these crucial cases and thereby discredit this model of proliferation.

*North Korea.* The process of disabling North Korea’s nuclear weapons production capability derailed in late 2008 over the sequencing of reciprocal actions and a U.S.-proposed plan for verifying Pyongyang’s nuclear declarations. Since then, a series of North Korean actions and statements have called into question not only the prospects for a return to negotiations, but also whether Pyongyang any longer intends to disarm.

In April 2009, the North launched a three-stage version of its long-range Taepo Dong-2 missile. In response to a UNSC statement condemning the launch, Pyongyang announced its withdrawal from the Six-Party Talks, renounced all previous agreements, expelled IAEA and U.S. monitors from the Yongbyon nuclear complex, and resumed its activity there. On May 25, North Korea conducted a second underground nuclear test and soon after renounced the 1953 armistice agreement that ended hostilities during the Korean War. In response to the test, the Security Council passed Resolution 1874, which bans all arms exports from North Korea, urges member states to inspect suspect North Korean cargoes on the high seas or at seaports and airports, and calls on states to deny financial services that could contribute to North Korea’s weapons programs.

No one outside the inner councils of the Pyongyang regime can state with certainty all the factors motivating its behavior. In part, this set of provocations may be “more of the same”—that is, the now-familiar pattern of creating a sense of crisis through belligerent posturing, intended to compel the United States and its partners back to the negotiating table and drive up the price for resuming talks and for further concessions. In this sense, the North’s actions may be seen as designed to gain the attention of the Obama administration at a time when it has been preoccupied by other pressing foreign policy concerns. In part, nuclear and missile tests may be a means of advertising the regime’s strategic wares in the WMD marketplace. They could also be tied to the internal politics of the looming North Korean

succession—perhaps the price that the military and hard-line elements have demanded for acceding to Kim Jong Il’s plan to make his youngest son his heir apparent. It is also possible that these actions are part of a deliberate process by which the regime seeks to establish itself as a permanent nuclear weapons state, no longer interested in any form of negotiations leading to verifiable denuclearization. Pyongyang has actively encouraged this reading of its intentions by telling Americans visiting as private citizens that it cannot say when it will abandon its nuclear weapons and that it seeks normalization of relations with Washington not as a *quid pro quo* for disarming but only after being recognized as a nuclear-armed state.<sup>25</sup>

Early policy statements from the Obama administration declared a willingness to normalize bilateral relations, seek a permanent peace treaty, and provide additional energy and economic assistance once verifiable disarmament has been achieved.<sup>26</sup> Thus, the issue was framed as a strategic choice facing North Korea: remain nuclear-armed or achieve normal relations with the United States—but not both. Despite Pyongyang’s provocations and its renunciation of the Six-Party Talks, the United States in late July 2009 continued to hold out hopes for the resumption of negotiations, and senior officials were suggesting that a new approach to the Six-Party Talks was likely—one that would replace the longstanding step-by-step or “action-for-action” process with a “comprehensive package” that would resolve all outstanding issues more or less at once.<sup>27</sup> At the same time, Washington made clear that it would not offer new concessions simply to return to the status quo ante; Pyongyang would be expected to return to compliance with agreements already reached through the Six-Party Talks and earlier diplomatic engagements. Moreover, the Six-Party Talks remained the only acceptable forum for resuming formal discussions on denuclearization—not the bilateral dialogue with Washington that Pyongyang continued to push for.<sup>28</sup>

Both to press the North to return to negotiations and to hedge against its refusal to do so, the Obama administration in the summer of 2009 moved to increase economic pressure on Pyongyang. In addition to the new sanctions embodied in UNSC Resolution 1874, the United States pressed for additional collective sanctions against individual North Korean companies, and took unilateral action against two companies designed to deny them access to the global financial system. In addition, the United States was actively considering relisting North Korea as a state sponsor of terrorism and seeking opportunities to enforce the interdiction provisions of Resolution 1874 so as to deny the regime its lucrative trade in arms, which by some estimates yields \$1.5 billion in annual sales.

Whether a sharpened focus on economic pressure and interdiction would bring North Korea back to the negotiating table remained to be seen. Certainly, though, these measures also reflected serious concern among senior officials that the collapse of diplomacy could lead Pyongyang to more aggressively market its nuclear materials, technology, and know-how. U.S. National Security Advisor General James Jones, USMC (Ret.), voiced this concern by stating of North Korea's nuclear capability: "The imminent threat is the proliferation of that type of technology to other countries and potentially terrorist organizations and nonstate actors." An unnamed senior official added: "The concern is not just that they have a nuclear weapon, it's what they're going to do with the technology and where it's going to go. It's very difficult to have perfect knowledge about who they're talking to or where they're sending stuff."<sup>29</sup> The danger of North Korea becoming a supplier of nuclear goods is underscored by its suspected involvement in the construction of a nuclear reactor in Syria destroyed by an Israeli airstrike in September 2007. This points to the need to prevent and deter the regime from becoming an active supplier, and to ensure it understands that it will be held accountable—and pay a heavy price—for facilitating others' acquisition of nuclear capability.

At the same time, even if diplomacy falters yet again, it will be important for the United States to reassure regional allies that it does not intend to pursue a strategy of containment and interdiction exclusively. For this reason, statements by the United States reiterating that it will never accept North Korea as a nuclear-armed state or normalize relations without verifiable disarmament are key to expressing solidarity with these allies, whose principal goal remains denuclearizing North Korea, not simply containing its ability to transfer nuclear technologies. Until such time that the ultimate goal of denuclearization can be realized, U.S. policy must also be attentive to the proliferation pressures that could be generated by North Korea's continued possession of a small stockpile of nuclear devices and some amount of separated plutonium that could be fabricated into additional devices. By moving deliberately, through words and actions, to reinforce extended deterrence relationships, Washington should be able to manage these pressures.

*Iran.* Before the political unrest triggered by Iran's disputed presidential election of June 2009, U.S. policy toward the nuclear issue had taken shape in ways that reflected both continuity with and change from the approach adopted by the Bush administration. The United States is posing the same basic choice to Iran: cooperation and integration in exchange for demonstrably limiting its nuclear potential, or

deepening political and economic isolation. And Washington remains focused on a strategy of carrot and stick diplomacy to lead Tehran to the right choice. The terms of this diplomacy have changed, however. The United States now seems determined to definitively test Iran's willingness to reach an accommodation that limits its fuel cycle activities through a time-limited diplomatic process. To do so, Washington is prepared to negotiate directly with Tehran on a bilateral basis, and has dropped as a condition for such talks that Iran suspend enrichment activities. Iran would be free to continue enriching uranium for some period of time as negotiations proceeded. Ultimately, however, Iran would be expected to suspend enrichment activities as demanded by several UNSC resolutions, at least until such time as confidence in the peaceful nature of its program is established. Initially, this could take the form of a "mutual freeze" whereby Iran suspends enrichment and additional sanctions are deferred. Presumably, this would create some breathing space that would allow the two sides to explore the possibilities of a more substantive accommodation.<sup>30</sup> To further encourage Tehran, the United States is also prepared to engage more broadly on a set of "incentives" tabled in 2006 and 2008 that address regional security issues, normalization of political and economic relations, and assistance with civil nuclear energy.<sup>31</sup>

The post-election turmoil in Iran has cast some uncertainty over prospects for direct U.S.-Iranian engagement, even under these new terms. The regime simply may be unable to make a decision on resuming negotiations in an unsettled political environment. A complicating factor could be the degree to which the regime has blamed internal unrest on outside agitation by the United Kingdom and the United States, in particular. On the other hand, Tehran might see resuming negotiations as a means to deflect international attention from its suppression of the opposition and shore up its eroded legitimacy. In July 2009, there were indications from the regime that it was preparing new negotiating proposals. For its part, the United States remained openly committed to direct dialogue, although President Obama did concede that "the prospects of bilateral engagement may have been shifted as a consequence of this post-election activity."<sup>32</sup> Still, as things stood in late July 2009, the United States, in parallel with the Group of Eight, was calling for a resumption of negotiations with the intent to take stock of progress within a few months. The message here seemed clear enough: negotiations need to begin soon, and they will not be open-ended. Tehran will need to demonstrate fairly quickly that meaningful

progress toward a suspension of enrichment and the establishment of greater transparency can be achieved. If not, additional sanctions will be considered.

This strategy is premised on the belief that diplomacy focused on the suspension of enrichment remains the approach most likely to minimize proliferation risks and need not lead inevitably to an unconstrained Iranian enrichment program.<sup>33</sup> In this view, there are still opportunities to constrain and delay this program through export controls, sanctions, targeted financial measures, and other means, possibly to include sabotage.<sup>34</sup>

In the end, it may not be possible to prevent Iran from acquiring a breakout nuclear weapons capability based on its enrichment effort, but the international community simply cannot legitimize Iran's nuclear activities in defiance of the UNSC. The risks of doing so, it is argued, are simply too great.

Thus, it follows that the best—or least bad—course of action is to sharpen both the inducements and the penalties facing Tehran as it contemplates a strategic decision to seek accommodation or continue its defiance. Stronger inducements take the form of the aforementioned incentives package, which could include discussions about security assurances regarding Iran's territorial integrity and sovereignty, recognition of Iran's regional role, and more concrete economic benefits that could be delivered quickly with the goal of improving the economic plight of the Iranian people.<sup>35</sup> Stronger penalties intended to reinforce the regime's sense of risk would take the form of "tougher sanctions"—but is this a realistic prospect? It will be a challenge indeed to convince Russia and China, in particular, but possibly other key players such as Germany and France, as well, to agree to the kinds of sanctions that might change the calculus of the Iranian leadership—for instance, curtailing significantly Iran's ability to import refined oil products, which many consider the regime's most serious economic vulnerability.<sup>36</sup> Recent reports of a \$40 billion Chinese investment in Iranian gasoline refining, if accurate, underscore the challenge of imposing "hard sanctions."<sup>37</sup> Others have argued that raising the stakes for Tehran and enhancing Western negotiating leverage also require a more determined effort toward the objective of regime change and/or a more salient threat of military action.<sup>38</sup> Whether such tactics will lead the regime to reconsider its nuclear program or redouble its efforts is not clear.

Over the last 18 months, there has been growing commentary arguing that this bargaining strategy has largely run its course and requires a basic reassessment if the international community is to find some way to

meaningfully contain the regime's nuclear potential. The premise here is that the West's current approach is destined to fail—in part because the sharply differing interests of key players make hard sanctions and other forms of cost imposition difficult to envision, but also in recognition of how Iran defines its own interests. In this view, no inducement is likely to be significant enough to outweigh Iran's desire for at least a breakout nuclear weapons capability, and “bigger sticks” only signal U.S. intent to pursue regime change and thus reinforce the rationale to possess a nuclear option. Rather, this alternative view holds that a revised strategy must acknowledge the progress Iran has already made on enrichment while negotiations have played out unproductively over several years. Insisting on “zero enrichment” on Iranian soil, it is argued, is an increasingly unrealistic position, and the principal concern now must be to gain some degree of transparency into and control over Iranian enrichment activities to ensure that diversion of these activities to manufacture nuclear weapons does not take place. Given that Iran's program is progressing, time is not on the West's side.

Proposals to move policy in this direction would allow Iran to produce its own nuclear fuel, but under highly controlled conditions.<sup>39</sup> One possibility is to impose limitations on the scope of enrichment designed to keep or delay it from reaching industrial scale, while imposing a comprehensive verification and inspection regime that includes IAEA safeguards, Additional Protocol measures, and continuous environmental sampling. Another approach is to multilateralize the enrichment enterprise in Iran so that the regime does not exercise full control over fuel cycle activities. Any number of multilateral arrangements is possible, but the basic concept is management and operation of Iranian enrichment facilities through an international consortium. The Additional Protocol and other monitoring, transparency, and confidence-building measures would be adopted. The production of highly enriched uranium and the reprocessing of plutonium would be prohibited, as would any participation by members of the Iranian military. Iran would commit itself to a program of light water reactors only.<sup>40</sup>

Approaches along these lines would effectively shift the focus of Western concern from zero enrichment to “no weaponization.” The idea is to create a barrier between a latent nuclear weapons capability and an actual one. In essence, this would redraw the redline of unacceptable Iranian behavior at the production of nuclear weapons and withdrawal from the NPT. With its “right” to enrich uranium on its soil *de facto* secured, the new test for Iran would become its willingness to accept



meaningful controls on its nuclear infrastructure and constraints on its ability to manufacture weapons. The penalty for crossing this redefined redline would need to be clearly understood by the Iranian leadership: severe economic sanctions—if not via the Security Council, then certainly through the coordinated policies of the United States, European Union, and potentially other members of the Organisation for Economic Co-operation and Development—and possibly the use of military force.<sup>41</sup> Realistically, the United States and its allies would in parallel begin to develop a tailored deterrence strategy to hedge against Iran crossing the line and achieving an operational nuclear capability.

In contemplating the basic alternatives outlined above—suspending enrichment or trading enrichment for transparency and controls to prevent weaponization—the relative risks seem clear enough.<sup>42</sup> Those arguing for maintaining current policy or some variant of it see a high degree of risk in schemes that legitimize Iranian enrichment in return for safeguards that are likely to prove ineffective in denying Iran a breakout nuclear capability. The primary risk is, in fact, increased potential for breakout resulting from greater access to technology and the accumulation of knowledge and experience, which could be applied, as well, to covert activities in unsafeguarded facilities unknown to the West. Iran is believed to have conducted work on weaponization in the past and continues to pursue technologies relevant to weaponization, even as the regime persists in denying such work and refuses to cooperate with the IAEA's investigation of the possible military dimensions of the nuclear program. Iran could resume work on weaponization at any time, and it is possible that this work could go undetected. Thus, a redline focused on weaponization could be difficult to enforce. Additional risk stems from the possibility that accepting Iranian enrichment in defiance of the UNSC would weaken any disincentives that now exist among other nations in the region to pursue indigenous fuel cycle capabilities, and more generally would undermine faith in the international nonproliferation regime.

Those arguing for acknowledging Iran's progress in enrichment and focusing on weaponization pose a different risk calculus. They believe that the key danger of continuing with the zero enrichment strategy is that Iran will make significant additional progress in enrichment through a program that faces few meaningful technical constraints and whose activities cannot effectively be verified as entirely peaceful. We will then face a long period of uncertainty about Iran's capabilities and intentions. And the longer the West waits to propose alternative or fallback approaches, the less likely the regime will be to consider them seriously

and the less effective they likely will be if adopted. Furthermore, it is argued, while there are certainly risks associated with fallback options, they are not as significant as portrayed. Moreover, the regime may conclude on its own that there is too much risk in breaking fully with the NPT by producing (and possibly testing) one or more nuclear weapons, and that Iran's requirements for security and prestige are met by achieving a breakout capability. On balance, then, this argument concludes, it is better to press the test on no weaponization. To do so may legitimize Iranian enrichment and vindicate the regime's hard-line posture and defiance of the Security Council, but failing to make an effort to impose practical constraints on Iran's potential to produce nuclear bombs will do far more damage to the nonproliferation regime and create a much sharper stimulus to regional proliferation.

*Is a "Proliferation Cascade" Inevitable—or Even Likely?* All sides of this debate express serious concerns about the implications of North Korea and Iran as de facto nuclear powers. If these states succeed in demonstrating that a nuclear aspirant can violate its obligations with impunity or use the NPT as an effective cover for a weapons program, new strains on the nonproliferation regime are certain to result. But it is difficult to predict with high confidence precisely how these strains would manifest themselves. In the worst case, there could be a broad-based loss of faith in the treaty regime and its effectiveness as a security alternative to possessing nuclear weapons, resulting in greatly heightened proliferation pressures in East Asia and the greater Middle East, and possibly even a "cascade" of nuclear proliferation. In the best case, determined, creative, and timely efforts to put in place proliferation "firebreaks" could well serve to contain these pressures.

One concern is that successful challenges by rogue states to the normative system represented by the NPT will lead important nations that years ago made a strategic choice to remain nonnuclear—on the premise that additional nuclear states would not emerge—to reconsider that choice, with dramatic impact on the thinking of other nuclear abstainers. Japan is often cited as an exemplar of such a nation, one whose expectations about the effectiveness of nonproliferation norms have not fully been met (as reflected in the way India and Pakistan have been accepted as de facto nuclear powers, and in the failure to date to put in place a comprehensive nuclear test ban treaty) and possibly would be shattered by the failure to roll back or eliminate North Korea's nuclear capability. The possibility exists that such an outcome would be taken in Tokyo as a clear demonstration of the inability of the five permanent UN

Security Council members to act collectively to meet their responsibility to defend and enforce compliance with nonproliferation norms. Were Tokyo to make the choice to move away from nonnuclear status, it would also reflect a fundamental loss of confidence in U.S. nuclear security guarantees and the will or ability of Washington to use hard power to stand up to regional nuclear challengers.

In this scenario, Tokyo's choice could reverberate in at least two ways. It could lead other pivotal nuclear abstainers who wield significant influence in the nonproliferation community to take another look at their nonnuclear status. Brazil, Egypt, Indonesia, and South Africa are states that come to mind. Within East Asia, the danger is that Japan's action would be taken as signaling the collapse of the NPT regime and the failure of a central pillar of U.S. security policy. It could then generate pressure among states in the region (Australia, South Korea, Taiwan, and others) to pursue independent nuclear capabilities and, contrary to what some strategists in the United States might hope, these pressures would reflect loss of confidence in Washington more than a desire to abet a U.S. strategy of containing China.

Thus might a process of region-wide nuclear proliferation in East Asia unfold. Yet this scenario is far from inevitable. As noted earlier, the prospects of such a development would be shaped importantly by the nature of the residual North Korean nuclear capability, assessments of the overall strength of the regime, and actions by the United States to reassure regional allies and strengthen extended deterrence relationships. This was a principal focus of concern in Tokyo and Seoul following North Korea's nuclear test in October 2006. Both governments pressed the United States to reaffirm, clarify, and strengthen nuclear security guarantees. These dialogues continue today, and this is a particularly salient issue in U.S.-Japan security discussions, reflecting Tokyo's reported interest in a more formal and substantive consultative relationship with Washington concerning the nuclear umbrella.

Nor is it clear how quickly Japan could become a nuclear weapons state if a decision was made to do so. Based on its large stocks of fissile material and advanced science and industrial infrastructure, Japan unquestionably possesses the technical prerequisites for a nuclear breakout capability. Less evident is whether Japan has the political or bureaucratic-administrative structures to quickly develop a weapons capability.<sup>43</sup> Japan also risks a rupture in relations with Washington should its pursuit of a weapons capability be detected—a likely prospect. Should the United States withdraw its nuclear security guarantee in response, Japan would

then be faced with a potentially hostile response from China, including possibly a heightened nuclear threat from Beijing. Faced with such a threat, Tokyo would then have to consider not simply a rudimentary nuclear deterrent, but a more expansive and sophisticated force designed to achieve a secure retaliatory capability against China. Would Tokyo be prepared for such a daunting undertaking? South Korea would face a different set of constraints given its current lack of enrichment or reprocessing facilities. Taiwan also lacks such facilities. Moreover, Taiwan's effort to develop reprocessing capabilities likely would be detected well before completion by the United States and possibly China as well, and could provoke a military response from Beijing.<sup>44</sup> This is not to minimize the breakout potential of any of these states, but rather to suggest that rapid, unchecked proliferation in the region may not be in the offing.

Concerns about accelerated proliferation of nuclear weapons capabilities in the Middle East are, if anything, more pronounced given widespread fears that a nuclear-capable Iran would be reinforced in its aggressive, hegemonic posture. It is not a coincidence that in the last 2 years, more than a dozen regional states have expressed interest in or intent to initiate or expand nuclear energy activities as Iran has demonstrated progress in its nuclear program. Energy security is undoubtedly a driver in this phenomenon, as is the association of *nuclear* with modernity and scientific accomplishment—but so too is a perceived need to hedge security bets as Iran gets closer to the bomb. Countries such as Algeria, Egypt, Saudi Arabia, Syria, and Turkey are often mentioned as states likely to initiate or join a regional move toward nuclear weapons capabilities, and only Turkey has stated publicly that it will not seek indigenous enrichment or reprocessing capabilities.<sup>45</sup> In each case, though, constraints and countervailing factors exist, and one could expect decisions about pursuing the nuclear option to reflect a complex cost-benefit calculus.<sup>46</sup>

Here too, then, it is important to avoid a self-fulfilling prophecy by equating the legitimate risks of a cascade with the inevitability of one occurring. It is worth noting that important Arab states have learned to live with a nuclear-armed Israel and did not react in kind to Iraq's pursuit of nuclear weapons under the Saddam Hussein regime. The Iranian threat may be fundamentally different to these countries, but they may also find that options exist to respond short of initiating their own nuclear weapons programs. Much will depend, of course, on how a nuclear-armed Iran behaves. But opportunities should exist to strengthen collective security and deterrence relationships as nations act to balance growing Iranian power through formal or informal coalitions. The Western powers have

a supporting role to play here. The challenge of deterring a nuclear Iran should not be underestimated, but neither should it be overestimated. Iran may feel regional or geopolitical trends are moving in its favor, but its power and influence are not unlimited, and its leadership is not entirely averse to risk.

***The Nuclear Latency Challenge.*** To a degree, the evident anxiety concerning nuclear cascades is healthy if it serves as a wake-up call and motivates serious thinking and wise actions to mobilize political will in the international community to strengthen the NPT, reaffirm extended deterrence relationships, and develop the means to manage the longer term proliferation risks associated with growing interest in civilian nuclear power. Steps can be taken now to counter whatever pressures may exist or may be building for accelerated nuclear proliferation in key regions. That said, there is no compelling evidence that the world is on the cusp of runaway proliferation leading in the near- or mid-term to several or many more nuclear powers. A cascade requires that strategic intent and an advanced technical capability, supported by rapid decisionmaking at the highest levels, converge at an accelerated pace in a number of countries at roughly the same time. Nuclear aspirations may indeed be rising, but what we are witnessing is less an imminent cascade and more a case of “nuclear hedging” as some states decide to keep open the nuclear option through the pursuit of civilian nuclear power.

As more states go down this path, the principal risk is one of increased *nuclear latency* over time—a growing number of states with increasing nuclear capacity and potential (in the form of knowledge, technology, and materials). By some accounts, based on projected growth in nuclear power in the Middle East (perhaps a dozen or more new power reactors), large civilian plutonium stocks are set to accumulate over the next 20 years.<sup>47</sup> Even if the full scope of current planning for nuclear power in this and other regions does not materialize, it is not too early to begin developing ways to minimize the proliferation risks inherent in the slow but steady accretion of nuclear materials and know-how. The focus should be on impeding the acquisition of the most sensitive fuel cycle technologies by states that do not already possess them (as proposed by President Bush in 2004) and significantly raising the political costs of turning a latent nuclear program into a bomb-making program (in hopes of deterring such a move).

A 2006 report by the Center for the Study of Weapons of Mass Destruction at the National Defense University summarized the latency challenge:

In a world characterized by high nuclear latency, a number of risks stand out. One is simply that there may be multiple ways for states to be considered nuclear-capable. While robust nuclear weapons programs remain the most serious proliferation danger, a range of possibilities below this threshold or level of capability must be of concern as well. So must be models of weapon development enabled by technologies and processes that might be easier to conceal and harder to detect (for example, laser enrichment). A nuclear-latent world also challenges our thinking about warning, suggesting the possibility of a significant mismatch between lead times and reaction times. Finally, careful attention must be paid to the catalytic or transformative events that could push a latent nuclear actor toward a more active or accelerated posture. Japan often is cited as a possibility in this regard, but also of concern are so-called rollback states that could, with varying degrees of ease, reconstitute their nuclear weapons programs in response to changed conditions.

These considerations have significant implications for political and technical intelligence, not least of which is the need for a sharper focus on intentions. More broadly, there needs to be a way to measure latency that is meaningful to decisionmakers and planners. Metrics may be qualitative and/or quantitative, and should strive to enable policies that can influence both intentions (for example, through incentives) and capabilities (for example, through barriers).<sup>48</sup>

Of greatest proliferation concern would be those nuclear-latent states capable of maintaining a robust civilian nuclear infrastructure and access to material that could be used to fabricate nuclear weapons. These states, if sufficiently motivated, would have greater means to transition relatively quickly from latent to actual capability. They may be characterized as “high capability hedgers.”<sup>49</sup> Managing the security challenge posed by a number of such states will require a diverse strategy that includes maintaining strong nonproliferation norms, strengthening NPT compliance rules, developing country-specific security strategies, improving capabilities for early intelligence warning of proliferation intent, tailoring export control and interdiction strategies as needed, and sustaining extended deterrence relationships to ensure that allies feel sufficiently secure to remain nonnuclear.

As we enter a period where nuclear latency and a greater overall degree of ambiguity in capabilities and intentions become the norm, it may be more difficult to define nonproliferation success and failure and to determine if the international community is winning, losing, or just

trading water. Despite our cultural inclination to declare either victories or losses, the emerging nuclear landscape will be one in which “draws” are a distinct possibility.

## **Chemical and Biological Proliferation Challenges**

*Uncertain Activity and Intent.*<sup>50</sup> In contrast to the nuclear efforts of North Korea, Iran, and perhaps Syria, no states are newly pursuing, or suspected of pursuing, *in an overt or exposed manner*, chemical or biological weapons. Unlike nuclear weapons, chemical and biological weapons are comprehensively prohibited by international conventions.<sup>51</sup> Comprehensive prohibition reflects and reinforces a strong international norm against possession as well as use. Chemical and biological weapons also are not associated with great power status or technological prowess as nuclear weapons are. There is little upside and much downside politically for a state, even one that is not a party to the chemical and/or biological weapons conventions, to openly possess or pursue such weapons, at least any that the state has not declared, disavowed, and committed to eliminate. Offensive programs are pursued covertly.

Some states nonetheless appear to find it useful for deterrence purposes that others assess that they possess chemical or even biological weapons. Syria probably is the least circumspect in concealing what is widely assessed as an active chemical weapons program intended primarily to counter Israeli military superiority, including Israel’s suspected nuclear arsenal. Saddam evidently thought it useful to perpetuate others’ suspicions that he had retained or reconstituted elements of his pre-Persian Gulf War chemical and biological weapons programs, even though those suspicions ultimately led to the deposal of his regime and his own death.

While Syria is not among the states parties to the CWC (Iraq recently acceded), being a party or signatory to the CWC or its biological counterpart, the BWC, does not necessarily constitute compliance. The United States has expressed concerns about a number of states parties’ compliance with these conventions, among them Iran, Russia, and China.<sup>52</sup> Noncompliance, however, is hard to detect and harder to prove. Chemical and biological weapons programs can be concealed within dual-use facilities and activities. Just-in-time mobilization capabilities concealed within such facilities can substitute for the more conspicuous large weapons stockpiles of earlier years. The BWC has no enforcement mechanism, and no challenge inspection has ever been requested under the CWC enforcement mechanism.

Various nonstate entities have expressed interest in and/or have been found to be actively pursuing chemical and biological weapons. Osama bin Laden has on more than one occasion justified the acquisition and employment of such weapons. U.S. forces discovered in Afghanistan a more robust al Qaeda biological weapons development effort than expected as well as a video of suspected al Qaeda testing of a chemical agent on a dog. The only confirmed uses of chemical or biological weapons since the Iran-Iraq War also have been perpetrated, or believed to have been perpetrated, by nonstate actors, including most famously the 1995 Aum Shinrikyo sarin attack on the Tokyo subway and the 2001 anthrax letters in the United States.

Chemical and biological weapons activities always have been difficult intelligence targets, and that will not change in the foreseeable future. While the interest of some terrorist entities in acquiring these types of weapons is well known, we know less about what chemical and biological weapons capabilities terrorists actually may possess than we do about what states possess. If anything, scientific/technological and industrial trends will make the collection and analysis challenges more difficult. Enabling knowledge will become more widely available, proliferation harder to detect, and use perhaps more likely.

***Chemical and Biological Latency Challenges.*** In the chemical arena, manufacturing has globalized. Production no longer is dominated by a few, mainly Western, multinational companies, but now occurs in many more facilities spread over many more countries. Growth has been particularly pronounced in Asia. Production facilities also are getting smaller and using new technologies. Individual plants used to focus on the bulk production of just a few chemicals; modern plants can economically produce a wide range. As more people in more countries are involved with chemical technology and manufacture, there will emerge inherently more scope for chemical weapons activity. It also may be harder to detect illicit activity, particularly in smaller chemical plants using new technology, at least with the means currently used by inspectors for the Organization for the Prohibition of Chemical Weapons.<sup>53</sup>

New tools, including robotics, microreactors, and ever more powerful computing capabilities, have dramatically increased the number of new chemical compounds that can be synthesized and the rate at which they can be synthesized and screened. Commercial entities are creating large libraries of new chemical compounds, some of which may be highly toxic and useful for weapons.<sup>54</sup> Nanotechnology is another rapidly developing



area that could have important implications for chemical warfare, particularly for the identification and development of new or improved dissemination techniques, building on ongoing work to use nanotechnology to improve the delivery of drugs for therapeutic purposes.<sup>55</sup> There is an increasing convergence of chemistry and biology as scientific disciplines are increasingly being applied to the search for new chemical compounds with particular effects on biological systems.<sup>56</sup>

The rapid pace of development in the biological sciences and biotechnology is making more accessible the expertise and technology to produce biological weapons and also may be enabling new types of such weapons. Organisms are available throughout the world—in nature, laboratories, and type collections. Most of the requisite expertise and equipment for biological weapons are dual-use, and much dual-use equipment is available for production, processing, and dissemination of biological agents. The commercialization of bioreactors has made it easier to produce agents. Commercial technologies, such as agricultural sprayers, dry agent production techniques, and, more recently, microencapsulation, facilitate agent dissemination.

Revolutionary insights in biology are lowering the educational threshold needed to produce a pathogen. What was once difficult is now often relatively simple. The diffusion of advanced techniques in biological sciences has made routine what was once advanced science, just as the commercialization of advanced biotechnology has made common what were once sophisticated capabilities. The number of recorded genetic sequences has increased dramatically. New classes of infectious agents have emerged, including prions, viroids, and satellite viruses/nucleic acids. The relatively new fields of synthetic biology and bioengineering already have enabled scientists to create the polio virus from scratch, and perhaps in the not so distant future will enable creation of more pathogenic viruses, such as smallpox (which no longer exists in nature), as well as the engineering of new organisms, some of which may prove conducive to weaponization.

We still do not fully understand how the rapid advances in science and technology will change the landscape for biological and chemical weapons. These emerging developments are commercially driven and promise to yield many beneficial products for mankind. Like almost all scientific and technological progress, however, the potential to do good comes with the potential to do evil, and where such potential exists, bad actors will endeavor to exploit it. The bad actors able to exploit the most technologically sophisticated developments first most likely will be

states with offensive biological and/or chemical weapons programs, but commercialization and globalization already have made the catastrophic use of biological and chemical weapons accessible to terrorists. Rapid advances in science and technology likely will accord a continuing advantage to offense over defense, as defensive responses lag the development of new forms of attack. As technical barriers decline, adversary intent will become an ever more important part of the biological and chemical threat equation. Intentions, though, traditionally have been an underserved focus area for the U.S. Intelligence Community, which historically has devoted most of its resources and time to locating and characterizing capabilities rather than the admittedly more difficult task of discerning intentions separate from or beyond what can be inferred just from an assessment of an actor's capabilities.

**Response Challenges.** These trends pose many response challenges for the United States. How does the Nation prevent chemical and biological weapons proliferation when detecting and tracking illicit programs are already hard and likely to get harder? How do we prevent such proliferation when the basic enabling capabilities are becoming accessible to more and more actors as part of the benign expansion of chemical and biological knowledge and facilities? How does the Nation prepare to defend against the possible emergence of new and unknown types of weapons agents and forms of dissemination?

**Intelligence.** Clearly, more and better intelligence about others' chemical and biological weapons-related activities would be valuable. The Intelligence Community should examine whether it is devoting the requisite effort and resources to this problem. With the policy priority currently accorded to nuclear proliferation challenges, particularly in Iran and North Korea, and the intelligence demands associated with prosecuting the ongoing wars in Iraq and Afghanistan in particular and the struggle against terrorism more generally, it is worth asking whether the relative paucity of recent intelligence about chemical and biological weapons activity by states and other actors is indicative of an actual decline in such activity or of our failure to penetrate the measures such actors have taken to hide such activity. Human sources have played a critical role in earlier major revelations of foreign chemical and biological weapons activities, dramatically impacting preceding intelligence assessments. Are our current human intelligence efforts in this area adequate?

**Technical Insights.** A broader understanding of weapons-relevant scientific and technological developments in the fields of biology and

chemistry also is important. This is needed to anticipate how cutting-edge scientific and technological developments might be exploited for weapons purposes and to make sense of intelligence that may be acquired on others' weapons-related activities. The United States can best possess this broader understanding if it remains on the forefront of chemical and biological science and technology. U.S. competitiveness in these fields depends increasingly upon the level and quality of its basic and applied research. Since the private sector drives progress in these fields today, the U.S. Government should consider how to partner with the private sector to help it remain highly competitive and cutting edge and to gain knowledge and insights needed to support robust chemical and biological defense efforts. The government can stimulate and support research through direct funding, particularly for basic research, and by shaping a business and regulatory environment conducive to industry investment, particularly in applied research. The U.S. Government should also continue its own institutes' research specifically directed at understanding how adversaries might exploit emerging chemical and biological developments for malign purposes and how to counter such dangers. The work of the Department of Homeland Security's National Biological Analysis and Countermeasures Center (NBACC) is particularly valuable in this regard; greater effort should be devoted to a counterpart effort on chemical threats.

*Compliance.* One of the challenges for conducting research intended to characterize and determine how to counter emerging or potential biological or chemical threat agents is ensuring that such classified work does not violate, and is not perceived as violating, the Nation's obligations under the BWC and CWC not to develop, produce, or possess biological or chemical weapons. Defensive research is permitted under those treaties, and that has been interpreted to permit the production, possession, and manipulation of minute quantities of agent for such purposes. Ensuring such violations do not occur is the result of a concerted series of national safeguards, including guidelines on what types of activities are allowed and prohibited; a deliberate and documented process by which scientists assess and ascertain the compliance of their proposed activities before they are undertaken; and a mechanism by which experts on the science and treaty obligations can review and authorize or prohibit any specific proposed "gray area" activities. Additionally, under the CWC, chemical facilities are subject to international inspections (there is no such provision under the BWC for biological facilities).

But such safeguards have not and will not satisfy all outside observers, some of whom have self-interested reasons for voicing suspicions.

Unrestricted access to such defensive research cannot be permitted for security reasons; for example, outsiders seeking access may do so precisely to gain insights that they can use to develop offensive capabilities and defeat the Nation's defensive countermeasures. Some therefore have argued that the Nation should not pursue defensive research because others will construe it as a cover for prohibited offensive work and will seize upon it as an excuse to pursue their own offensive programs. There will always be tension between the goals of anticipating and preparing to defend against emerging biological and chemical threats and unambiguously demonstrating full compliance with the BWC and CWC, but it would be irresponsible for the Nation not to continue its defensive programs under strict national safeguards given that the consequences of failing to prepare are potentially horrific.

*Deterrence.* Robust deterrence of chemical and biological threats is invaluable, but its cause and effect are hard to gauge. If an attack does not occur, was it because the adversary was deterred or never intended such an attack? If the adversary was deterred, was it by a threat of retaliation, by the influence of norms against the use of these types of weapons, by an expectation that it could not successfully prosecute the attack in the face of the target's defensive measures, or by some combination thereof? The United States attempts to effect deterrence by all three means.

The United States has communicated, at first implicitly but explicitly since at least 2002, that it might resort to nuclear weapons in response to any WMD use, including chemical and biological, against its territory, people, forces, or allies. Some have questioned the credibility of a nuclear response to any nonnuclear attack from the most likely foes in the post-Cold War era—rogue states and terrorists—but it must give some pause to any state adversaries that would contemplate use. Some believe that then-Secretary of State James Baker's implicit threat of a nuclear response contributed to Saddam Hussein's decision not to employ the chemical and biological weapons that he certainly did possess during the first Persian Gulf War.

Attribution capabilities are central to the credibility of such deterrence by threat of retaliation. The adversary must not believe that it can perpetrate WMD attacks anonymously. In recent years, the U.S. Government has accorded new emphasis to WMD attribution, most visibly through the establishment of the National Bioforensic Analysis Center, part of the NBACC, and the National Technical Nuclear Forensics Center, part of the Domestic Nuclear Detection Office at the Department of Homeland Security. The government also has issued classified guidance

on policy and organizational aspects of WMD attribution. As in other areas, the level of effort in attribution devoted to chemical threats lags that devoted to biological and nuclear ones. Attribution's contribution to the deterrence of chemical and biological use could be enhanced through greater efforts on chemical attribution; increased resources for modernizing and expanding technical forensics capabilities generally; and a strategic communications strategy that helps ensure adversaries understand our commitment and capacity to attribute WMD attacks.

Norms also likely play an important role in deterring or dissuading chemical and biological weapons use, as the "nuclear taboo" clearly does with regard to nuclear weapons use. The United States and other countries have been criticized for failing to uphold the norm against chemical weapons use that had been established by the 1925 Geneva Convention by tolerating, or at least expressing insufficient outrage at, Saddam's initiation of chemical weapons use during the Iran-Iraq War and his subsequent use of chemicals against elements of his own population. Those nations' response has been attributed largely to their stronger interest in maintaining Iraq as a regional bulwark against a revolutionary Iran. It certainly did not help, though, that the 1925 norm against chemical weapons use had been violated earlier by a number of other states, including by Italy against Abyssinia in 1938 and Egypt against Yemeni rebels in the 1960s. Iraq's chemical weapons use during the 1980s did, however, help spur the creation of the CWC, which renewed and strengthened the norm, especially by outlawing the possession as well as the use of such weapons. The BWC did the same for the norm against biological weapons use. There has been no confirmed state use of biological or chemical weapons since the BWC and CWC opened for signature in 1972 and 1993, respectively. The United States clearly has a strong interest in maintaining and strengthening these norms and the international conventions that underlie them.

The only known incidents of chemical and biological weapons use since the establishment of the BWC and CWC have been small-scale attacks perpetrated by nonstate actors, and these have been few. Only one series of small-scale attacks has been attributed to al Qaeda or its affiliates: al Qaeda in Iraq's joining of chlorine canisters to improvised explosive devices employed in Iraq in 2007. The impacts from the chlorine appear to have been minimal. Since some chemical and biological agents are considered readily accessible to terrorist organizations for malign purposes, it is hard to explain the paucity of chemical and biological attacks by such actors without some reference to the influence of norms.

Even terrorist organizations as ideologically inspired and ruthless as al Qaeda and its fellow travelers have political agendas and constituencies upon whom they depend for support and seek to influence. They need to be sensitive to how those constituencies will react to the nature of their attacks lest they put that support or influence at risk. Al Qaeda's deputy leader, Ayman al-Zawahiri, cautioned then-al Qaeda in Iraq leader Abu Musab al-Zarqawi against the negative impact that the latter's brutal attacks against Sunni Muslims was having on the group's support within Iraq. There have been reports of criticism directed against al Qaeda on jihadist Web sites for the violence it has perpetrated against coreligionists. Al Qaeda's leadership also has on several occasions undertaken to justify publicly its pursuit and potential use of weapons of mass destruction, including through the issuance of a fatwa to that effect. To the extent that the United States and its partners, particularly Muslim states such as Saudi Arabia and Pakistan, can strengthen the norm against WMD use among Islamic populations, the more likely it will be that jihadist terrorist entities such as al Qaeda will be self-deterred from perpetrating such attacks.

Deterrence by denial figured prominently in the Bush administration's approach to countering WMD threats of all types. Indeed, measures to defeat an attempted or actual attack have constituted the main thrust of U.S. efforts to counter biological and chemical threats since 9/11. This primarily has taken the form of passive defense and consequence management since biological and chemical agents/weapons are less susceptible to in-transit detection and interdiction than are nuclear/radiological materials/weapons with their radioactive emanations. Enhanced defeat capabilities lessen the impact of any actual biological or chemical attack and, thereby, may dissuade or deter adversaries from attempting such attacks by undermining their confidence that they could achieve their objective(s). This should pertain to terrorists as well as to state actors, as terrorists presumably do not want to be perceived by their constituencies as ineffective.

In the early 1990s, the only programs to address biological weapons threats were directed by DOD and focused on protection of military forces operating on the battlefield. In the late 1990s, however, DOD came to recognize that the chemical and biological weapons threat extended to rear areas, including facilities in the United States from which military forces were deployed. Equally important, the 1995 Aum Shinrikyo use of chemical agents in the Tokyo subway prompted efforts led by other parts of the government to protect civilian populations from chemical

and biological terrorism. These efforts accelerated after 9/11. Under the Department of Homeland Security's BioWatch program, environmental sampling capabilities have been put in place in more than 20 major U.S. cities to detect a biological attack as soon as possible after it has occurred so as to maximize the time available for treatment. It supplements disease surveillance programs supported by the Centers for Disease Control and Prevention intended to detect biological attacks through monitoring of disease outbreaks.

The Nation's preparedness to respond to biological attacks also has benefitted from making its Strategic National Stockpile more robust. Under a program managed by the Department of Health and Human Services (DHHS), medical countermeasures suitable for responding to WMD attacks and natural disasters are prepositioned around the country. There are, however, significant gaps in the availability of medical countermeasures to address many threat agents. As a result, development of new medical countermeasures has received considerable attention since 9/11.

Under the DHHS BioShield program, the Federal Government has acquired medical countermeasures and made funding available to pharmaceutical firms for advanced development and production of promising new WMD medical countermeasures that the commercial market would not be expected to finance on its own. While BioShield can and has made funding available for medical countermeasures against chemical and radiological as well as biological threats, the bulk of the funding to date has been provided for countermeasures against biological agents, such as a new anthrax vaccine. When BioShield was created, officials assumed that large pharmaceutical companies would respond to the government's requirements for medical countermeasures. This expectation proved false because the market was too small to attract serious interest by big pharmaceutical companies. The small firms that were responsive, however, often lacked both the financial resources needed to complete development of medical products and the experience in navigating the long and complicated drug approval process. In response to these problems, in 2007 a new Biomedical Advanced Research and Development Authority was created in DHHS and tasked with supporting new medical countermeasures through the full development process.

Less funding has been devoted to defeating chemical terrorism, consistent with the government's assessment that chemical attacks generally can be expected to be less consequential than biological ones (though it depends on the agent and scenario). The main thrust of post-9/11

counter-chemical efforts has been on enhancing the physical security of chemical plants, transportation modes, and storage sites. Terrorists are considered more likely to attempt to employ toxic industrial chemicals (TICs) in their planned chemical attacks than chemical warfare agents because TICs, though less potent, are far more accessible. The Strategic National Stockpile also is less likely to be effective in responding to chemical attacks than to biological ones in that the treatment window is far narrower for the former than the latter.

The military continues to invest in capabilities to defeat chemical and biological weapons use against U.S. forces, including in the areas of counterforce, detection, protection (including medical countermeasures), decontamination, and consequence management. The military also has established the nucleus of an enduring WMD elimination capability—that is, “actions taken in a hostile or uncertain environment to systematically locate, characterize, secure and disable, or destroy WMD programs and related capabilities.”<sup>57</sup> It has done this through the establishment of a Joint Elimination Coordination Element at the U.S. Army’s 20<sup>th</sup> Support Command—Chemical, Biological, Radiological, Nuclear, Explosives, which would form the core of a Joint Task Force—Elimination if an operational requirement to stand up a task force emerged.<sup>58</sup> This represents important progress in military counter-WMD capabilities, but the military, like the homeland security community, still lacks sufficient numbers of specialized WMD capabilities to handle the complex global demands of any large-scale WMD contingency that might unfold as the result of the sudden collapse or radicalization of a WMD-armed state.

Whether these defeat measures at home and for the battlefield make a significant contribution to deterrence, which is almost impossible to ascertain, their sustainment and extension clearly are important in a world where chemical and biological weapons capabilities are expected to become more accessible to a wider range of actors. If deterrence fails, the Nation will depend on these capabilities to save lives, reduce damage, and restore functionality.

### **The Obama Administration: Initial Observations**

Like its predecessor, the Obama administration has identified WMD proliferation and potential employment, and especially nuclear terrorism, as one of the most serious threats to U.S. and international security and expressed its determination to counter that threat. It is continuing and building upon many of the “combating WMD” concepts, initiatives, and programs inherited from its predecessor, particularly in the



areas of protection and response. Beyond its previously discussed reevaluation of strategies toward Iran and North Korea, the Obama administration's principal departures from the Bush administration's approach to WMD issues are its greater emphasis on traditional, treaty-based disarmament and nonproliferation, its reorientation of BMD programs, and, potentially, how it will ensure the reliability of the U.S. nuclear deterrent for as long as it is needed.<sup>59</sup> It also has made significant changes to its predecessor's organization for countering WMD, primarily in the Executive Office of the President and OSD, in an effort to improve the development and coordination of countering WMD policy.

***Nonproliferation and Disarmament.*** President Obama has embraced the vision of the global elimination of nuclear weapons and the Nation's special responsibility to lead the world in that direction that was articulated most famously by William Perry, George Schultz, Sam Nunn, and Henry Kissinger in January 2007.<sup>60</sup> Like these former senior government officials, the President concedes that achieving the actual elimination of all nuclear weapons is a difficult and long-term task, something that may not be attained in his lifetime, but contends that articulating the vision and taking practical steps toward its achievement are essential to containing and reversing the ongoing proliferation of nuclear weapons capabilities and to reducing the likelihood that such weapons will be used.

When the United States ratified the NPT in 1970, it formally undertook the obligation "to pursue negotiations in good faith on effective measures relating to . . . nuclear disarmament" as well as to the "cessation of the nuclear arms race at an early date" and on a "treaty on general and complete disarmament under strict and effective international control."<sup>61</sup> All U.S. administrations since have affirmed that obligation, so the Obama administration's stated commitment to the goal of eliminating all nuclear weapons does not actually constitute a new policy. But no U.S. administration has embraced that obligation and promised to put it at the center of U.S. nuclear weapons policy in the way that this administration has done (and without emphasizing its linkage to the accomplishment of "general and complete disarmament"). The Bush administration, in contrast, did not accept that there was a meaningful connection between managing the nuclear proliferation problem and advocating for the eventual elimination of nuclear weapons. It argued that actions to advance disarmament would not have any constraining effect on rogue states and terrorists, who present the most serious proliferation threat, and indeed would encourage these and other actors to advance their nuclear capabilities.

Advocates of the global zero vision, including the Obama administration, agree on the urgency of the nuclear proliferation problem but contend that the United States must mobilize broader and stronger international support to stop and reverse proliferation—and cannot do so unless it is seen to be committed to the goal of eliminating all existing nuclear weapons, including its own. They generally believe that the Bush administration, despite presiding over major reductions in the U.S. nuclear weapons stockpile, not only failed to convey a commitment to disarmament but also actually fostered a perception that it sought to expand the role of nuclear weapons in U.S. security policy. This largely was a result of first term proposals to develop new nuclear weapons capabilities, interpretations of major guidance documents (2001 Nuclear Posture Review, 2002 National Security Strategy), and some administration rhetoric. Although the Bush administration actually worked to reduce U.S. reliance upon nuclear weapons by integrating nonnuclear strategic capabilities (missile defenses, long-range conventional strike), and a number of administration officials eventually did endorse the global elimination vision, it never overcame the perception held by an influential segment of U.S. and international thought leaders that it lacked sufficient zeal for nuclear disarmament to be effective in defusing the world's growing nuclear dangers. The Obama administration is determined to be seen as leading the world toward the eventual elimination of nuclear weapons. Whether this will lead to more successful nonproliferation outcomes in the near term than the Bush administration was able to achieve remains to be seen.

President Obama has outlined a number of specific initiatives, some of which already are in train, to reduce nuclear dangers in the near term and establish the “building blocks” for eventual abolition. Many of these initiatives continue or build upon existing efforts, including securing vulnerable nuclear weapons–usable materials around the world, limiting the diffusion of enrichment and reprocessing capabilities by offering reliable international sources of reactor fuel, strengthening WMD interdiction capabilities, and making “durable international institutions” of existing activities such as the Proliferation Security Initiative and the Global Initiative to Combat Nuclear Terrorism. The President has committed to hosting in 2010 the first Global Summit on Nuclear Security to lend more international weight and urgency to these efforts. President Obama and Russian President Dmitry Medvedev also have committed to reach agreement to a successor to the START treaty that will further reduce both nations' nuclear weapons and delivery systems.<sup>62</sup>

Some administration nuclear initiatives depart markedly from recent policy. President Obama stated in Prague that he would immediately and aggressively seek U.S. ratification of the Comprehensive Test Ban Treaty (CTBT), which the Senate rejected in 1999 and which the Bush administration did not revisit during its tenure. The President also committed to negotiate a verifiable Fissile Material Cut-off Treaty; his predecessor had opposed as unworkable the inclusion of verification measures in such a treaty. The President further announced his intention to pursue additional nuclear weapons reductions beyond the START follow-on agreement and to engage all nuclear weapons states to that end. The Bush administration, which generally considered the negotiation of new, legally binding nuclear arms reduction agreements as unhelpful and initiated START follow-on discussions with Russia with some reluctance, did not address the possibility of negotiating deep reductions with nuclear weapons states other than Russia.

***Programs and Initiatives.*** Beyond an increased emphasis on more traditional approaches to nonproliferation, the Obama administration's emerging strategy to counter WMD threats is not so much different from its predecessor's than it is a promise to do more of it better. It has embraced the need for a robust, layered defense against WMD threats that can identify and dispose of such dangers as early and as far away from the United States as possible while also preparing for the possibility that WMD attacks nonetheless may be perpetrated. President Obama spoke in Prague of the need to break up black markets in nuclear materials and know-how, to detect and interdict materials in transit, and to use financial tools to disrupt WMD trade—all hallmarks of his predecessor's approach. As previously mentioned, he also emphasized the need to secure all vulnerable nuclear materials around the world and endorsed the Proliferation Security Initiative and Global Initiative to Combat Nuclear Terrorism. There has been no indication yet of intent to develop a replacement for the 2002 National Strategy to Combat Weapons of Mass Destruction and its framework of nonproliferation (prevention), counterproliferation (protection), and consequence management (response).

In remarks at the National Defense University on May 7, 2009, Under Secretary of Defense for Policy Michèle Flournoy characterized WMD as one of the most critical threats facing both the United States and the world. She observed that any WMD crisis could quickly "go global" and pledged an "absolute commitment" to make up for "lost time" in preparing DOD for responding to large and complex WMD events. She

identified WMD as one of the five specific security challenges for the forthcoming Quadrennial Defense Review, and delineated four strategic priorities for responding to it: increase barriers to WMD proliferation and use, develop layered and integrated WMD defenses, improve our ability to identify and mitigate emergent WMD threats, and manage WMD threats stemming from failing or failed states. Among DOD's WMD objectives are expanding cooperative threat reduction programs, strengthening legal authorities for interdiction, improving forensics and attribution capabilities, developing more effective detection, monitoring, and response networks to prepare Federal, state, and local communities for WMD crises, and forging stronger regional and global partnerships to counter WMD threats. None of this is inconsistent with the prior administration's approach, although the new team clearly feels much was left undone.

In the counterproliferation arena, the Obama administration has adopted a different approach to ballistic missile defense. Whereas the Bush administration conferred preferential status on BMD and pursued a "spiral approach" that allowed limited capabilities not yet fully proven to be deployed and then improved over time, the Obama administration seems committed to spending less overall on BMD and pursuing a more traditional approach to RDT&E. The President has stated that he will support missile defense systems that are "proven and cost-effective," and in his 2010 budget has redirected some resources from the Missile Defense Agency's budget to other defense needs and reoriented the program to emphasize more technologically mature systems. The budget caps further growth in the Ground Based Interceptor (GBI) program designed to defend against long-range missile threats and increases funding for more mature systems such as Aegis and Terminal High Altitude Area Defense designed for forward deployment to protect U.S. and coalition expeditionary forces and, where possible, allied populations. Other programs exploring more ambitious—and presumably riskier—technologies are either scaled back or terminated (such as Airborne Laser, Multiple Kill Vehicle, and Kinetic Energy Interceptor).

Additionally, funding is delayed for preparing interceptor and radar sites in Poland and the Czech Republic in support of the so-called BMD Third Site, designed to defend against long-range missile threats from Iran.<sup>63</sup> This has both technical and political dimensions. Technically, the interceptors in question are a two-stage variant of the GBI based in Alaska and California, and will require flight testing at least through 2010 before they may be ready for deployment. By not committing funding to site preparation while testing proceeds, the administration is

also sending a political signal that, while not renouncing the Third Site program, it is willing to explore alternative missile defense schemes that may be less objectionable to Russia, which sees the Third Site as a threat to its strategic interests despite U.S. assurances to the contrary. Among these alternatives is U.S.-Russian collaboration on a joint capability to defend Europe from Iranian missile threats—a capability that could build on the Third Site systems already identified or be based on other configurations. Meeting in Moscow on July 6, 2009, Presidents Obama and Medvedev issued a joint statement on missile defense issues pledging continued efforts to establish cooperation.<sup>64</sup>

It remains to be seen what program the Obama administration will adopt to ensure the continued reliability of the U.S. nuclear arsenal until such time as all nuclear weapons might be abolished. Though having committed to the vision of global zero, President Obama has pledged to maintain a safe, secure, and credible nuclear arsenal to deter adversaries and to guarantee the defense of our allies as long as others possess nuclear weapons. But he also has disavowed the development of new nuclear weapons.

In its second term, the Bush administration proposed to ensure the long-term reliability of U.S. nuclear weapons without resuming nuclear testing by building replacement nuclear warheads based on existing weapons designs but utilizing new materials and parts. Although this proposed Reliable Replacement Warhead (RRW) program explicitly disavowed giving new warheads greater military capabilities than the ones they would replace, Congress refused to fund the program. Instead, Congress deferred any major decisions regarding the future nuclear stockpile to the next administration. It established the Congressional Commission on the Strategic Posture of the United States to provide outside advice on these matters and to inform the next Nuclear Posture Review, to be submitted by early 2010 in conjunction with the 2011 budget. In March 2009, the Obama administration formally terminated the RRW program.<sup>65</sup>

The Strategic Posture Commission's report, delivered in May 2009, did not seek to resurrect RRW but made it clear that the current reliance on stockpile stewardship and life extension programs will not suffice over the long term. It explained that a spectrum of options exists for ensuring the arsenal's long-term reliability that ranges from the pure remanufacturing of existing warheads with existing components at one end to complete redesign and new production of all system components at the other. Rather than apply a single solution to the entire arsenal, it advocated

applying whatever technical option along this spectrum is most appropriate for each type of warhead and consistent with broader U.S. nuclear weapons policy:

So long as it continues to rely on nuclear deterrence, the United States requires a stockpile of nuclear weapons that are safe, secure, and reliable, and whose threatened use in military conflict would be credible. The Stockpile Stewardship Program and the Life Extension Program have been remarkably successful in refurbishing and modernizing the stockpile to meet these criteria, but cannot be counted on for the indefinite future. The Commission observes that the debate over the proposed Reliable Replacement Warhead revealed a lot of confusion about what was intended, what is needed, and what constitutes “new” and believes that, as the nation moves forward, it must be clear about what is being initiated (and what is not) as well as what makes a weapon “new” and what does not. Alternatives to stockpile stewardship and life extension involve to varying degrees the reuse and/or redesign of components and different engineering solutions. . . . As a matter of U.S. policy, the United States does not produce fissile materials and does not conduct nuclear explosive tests. Also the United States does not currently seek new weapons with new military characteristics. Within this framework, it should seek the possible benefits of improved safety, security, and reliability available to it.<sup>66</sup>

The commission’s report may provide the Obama administration with the bipartisan, expert justification that it would need to put forward a refurbishment and modernization strategy that could include the development of one or more new warheads albeit without new or additional military capabilities. This could both address concerns about the long-term reliability of the U.S. nuclear arsenal and help ensure sufficient political support for other, potentially more contentious parts of its nuclear agenda, particularly ratification of the CTBT (the only issue on which commission members could not reach consensus).

**Organization.** The Obama administration also has made some notable changes to the government’s organization for WMD matters. Within the Executive Office of the President, it established the position of WMD Coordinator. The President folded the Homeland Security Council (HSC) staff into the National Security Council (NSC) staff (renamed the National Security Staff) while maintaining both councils and the position of the Assistant to the President for Homeland Security and Counterterrorism. In 2007, Congress directed through Public Law 110–53 the

creation of the U.S. Coordinator for the Prevention of Weapons of Mass Destruction Proliferation and Terrorism to serve as the President's principal advisor on those threats, but the Bush administration chose not to implement the legislation. In December 2008, the Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism reiterated the call to establish a WMD coordinator and also called for the restructuring of the NSC and HSC. It held that nonproliferation interests were being given insufficient weight in the policymaking process when they conflicted with other interests, a problem it saw as compounded by having WMD proliferation and terrorism matters overseen by two parallel staffs—those of the NSC and HSC.<sup>67</sup>

It is not self-evident that the White House's new structure will be more efficient or effective than its predecessor's, at least as a result of the establishment of the WMD Coordinator position. Like the previous administration's NSC Senior Director for Counterproliferation Strategy, the new WMD Coordinator does not report directly to the President but through the National Security Advisor and his principal deputy. The WMD Coordinator also reports through the Assistant to the President for Homeland Security and Counterterrorism for matters under that official's purview (organizationally defined as those of the WMD Coordinator's subordinate directorate for WMD Terrorism and Threat Reduction). The Assistant to the President for Homeland Security and Counterterrorism organizationally reports to the National Security Advisor but also is the President's principal advisor, with direct and immediate access to the President, on his issues.<sup>68</sup> The consolidation of the HSC and NSC staffs may have more impact on the interagency policy development and coordination process.

Within the Defense Department, the Under Secretary of Defense for Policy has reconnected key WMD policy domains at the assistant secretary and deputy assistant secretary levels. WMD policy portfolios have been consolidated under the Assistant Secretary of Defense for Global Strategic Affairs (GSA), with the exception of those pertaining directly to homeland security, which are statutorily reserved to the Assistant Secretary of Defense for Homeland Defense. Within GSA, U.S. strategic forces and missile defense policy matters now fall under the Deputy Assistant Secretary of Defense for Nuclear and Missile Defense Policy, and all other counter-WMD policy matters (to include cooperative threat reduction) under the Deputy Assistant Secretary of Defense for Countering WMD. In the previous administration, WMD responsibilities were divided between three assistant secretaries and a larger number of deputy assis-

tant secretaries. Those responsibilities also were joined with unrelated ones, such as in the case of one deputy assistant secretary with responsibility for both counternarcotics and counterproliferation. Thus, a stronger organizational foundation may now exist to promote improved unity of effort within OSD and, thereby, in DOD as a whole. Realizing this payoff, though, may require reversing reductions made in the last administration in the number of staff, especially those with WMD expertise, assigned to WMD policy issues, particularly within OSD and the Joint Staff. It also will require the new administration's defense team to resolve the earlier discussed issues associated with the 2005 assignment to U.S. Strategic Command of the mission to integrate and synchronize the department's combating WMD activities.

## Conclusion

During the National Defense University Center for the Study of Weapons of Mass Destruction's May 2008 symposium, one panel endeavored to forecast the saliency of WMD issues for the new administration that would assume office the following January. It anticipated that WMD issues would be less salient than for the Bush administration. Iraq and Afghanistan would preoccupy the new administration. Iran would remain a major challenge but for much more than its nuclear program and would be the subject of a more holistic, and less nuclear-centric, approach. The North Korean nuclear program hopefully would remain off the front burner with continuing, if painful, progress in implementing the agreed denuclearization "action plan." Counter-WMD programs would lose ground in an intensified competition for resources in a deficit-constrained Federal budget. And this was well before the trough of the financial crisis.

Yet the Obama administration, like its post-Cold War predecessors, has placed WMD among its top national security priorities. North Korea and Iran remain front and center in U.S. strategic and regional security policy. The President's defense policy team has pledged to make up for lost time in developing the capacity to prevent and manage large-scale WMD crises. Significant organizational changes have been made to facilitate the achievement of the administration's counter-WMD goals. Perhaps most prominently, President Obama's ambitious nuclear agenda—to include his embrace of global zero—is explicitly an effort to strengthen international efforts to limit the further proliferation of nuclear weapons.

It is somewhat remarkable that WMD has remained so prominent among U.S. threats when no WMD have been used (or are known to have



been used) against U.S. forces since 1918, and the few known cases of nonstate actor WMD employment within or against the United States in modern history resulted in only a handful of fatalities. Just the prospect of their strange and horrific consequences and the worrisome nature of some of the actors who possess or seek them is enough to hold the attention of the Nation's leadership. Never have weapons so seldom used commanded such attention for so long. It is one of the more notable continuities across the post-Cold War administrations.

The balance of concern among the various types of WMD threats has shifted over time, though. "Loose nukes" emanating from the former Soviet Union predominated in the immediate post-Cold War period. With the rise of the perceived military threat from rogue states such as Iraq, Iran, and North Korea in the 1990s, chemical weapons threats moved to the forefront of U.S. military planning for WMD, with increasing attention later that decade and early the next to the biological threat that such states might also pose. By 2004, though, nuclear had overshadowed chemical and biological among perceived rogue state WMD threats as it became apparent that the Agreed Framework had not reined in North Korea's nuclear ambitions and that Iran's nuclear program extended far beyond the Bushehr reactor; both these programs continue to advance. But the prospect of WMD terrorism, possibly abetted by WMD-capable rogue states, became and remains the greatest perceived WMD threat to the Nation after the September 11, 2001, terrorist attacks and subsequent anthrax letters. Nuclear and biological terrorism are the principal focus of that concern today because their assessed worst-case consequences exceed those of chemical or radiological terrorism, but the balance could shift toward chemical or radiological threats if a major terrorist incident involving one or both of those types of weapons, which tend to be more accessible, occurred.

Over the past two decades, the priority accorded to the WMD threat, in its varying forms, has resulted in greater U.S. capacity to prevent WMD proliferation and to protect and respond to potential WMD employment. CTR programs were established, expanded, and refined to stabilize and reduce the danger of WMD capabilities emanating from the former Soviet Union. Beginning in the 1990s, the U.S. military rationalized and expanded its chemical and biological defense efforts to defeat traditional threats of these types posed by rogue states. Increasingly, it is investing in understanding and mitigating nontraditional chemical and biological threats that already exist and could become more salient. The Nation responded to the

post-9/11 WMD terrorism threat with new concepts, institutions, and infrastructure for homeland security and whole-of-government cooperation. Large sums have been invested in WMD terrorism prevention and response, primarily for nuclear and biological terrorism, as manifested in programs such as the global nuclear detection architecture, BioWatch, and BioShield. New mechanisms for international cooperation against WMD were established through agreements, resolutions, initiatives, and programs such as the CWC, UNSC Resolution 1540, Proliferation Security Initiative, Global Partnership against the Spread of Weapons and Materials of Mass Destruction, and creative use of financial sanctions. This is an important legacy upon which the Obama administration can build.

These investments and other efforts likely have been effective, at least to some extent, in preventing our worst WMD fears from being realized. But it is not possible to determine to what extent this has been the result of luck—that we have avoided worse outcomes despite ourselves—or even to what extent we may have been overly concerned about this threat and devoted more time and treasure to it than was required. Given the potential consequences of underestimating and thereby leaving the door unnecessarily open to the use of WMD, the prudent thing is to continue to accord high priority to countering such an inherently dangerous constellation of weapons.

Much remains to be done to counter the WMD threat as it exists today and as it is likely to evolve in the future, despite the progress made to date. One major task is to enhance the Nation's capacity to prevent and manage large-scale WMD crises, which could emerge at any time. That should be achievable with sufficient political will and resources. A less tractable but no less important task will be resolving the proliferation challenges posed by Iran's and North Korea's nuclear programs, which include not only the direct dangers associated with those nations' possession of nuclear weapons capabilities but also the impact that could have on the larger nonproliferation regime. The Obama administration will test whether a new U.S. President unburdened with his predecessor's image problems and demonstrating leadership toward the long-term goal of global nuclear disarmament can sufficiently change the international context for proliferation to resolve these challenges and strengthen the nonproliferation regime.

Finally, the Nation must prepare for the evolving WMD threats of tomorrow. The continuing progress of science and technology can be expected to present opportunities to develop new and even more

troublesome means of perpetrating mass destruction. The Nation will need to invest in anticipating and preparing to preempt or counter such developments as it strives to ensure that our worst fears about the proliferation and use of WMD remain unfulfilled.

## Notes

<sup>1</sup> The White House, “Fact Sheet: Nonproliferation and Export Control Policy,” September 27, 1993. In addition to stating these principles, this document outlines policy objectives regarding the proliferation of nuclear, biological, and chemical weapons, missile proliferation, fissile material, export controls, regional nonproliferation initiatives, military planning and doctrine, and conventional arms transfers.

<sup>2</sup> In 1996, the Coordinating Committee on Export Control was replaced with the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies.

<sup>3</sup> See Bradley H. Roberts, “Nonproliferation Challenges Old and New,” The Counterproliferation Papers, Future Warfare Series No. 24, U.S. Air Force Counterproliferation Center, August 2004.

<sup>4</sup> The Nunn-Lugar legislation is officially known as the Soviet Nuclear Threat Reduction Act. It was enacted in November 1991. The Department of Defense (DOD) was designated executive agent for the cooperative threat reduction program created by the act.

<sup>5</sup> Remarks by the Honorable Les Aspin, Secretary of Defense, National Academy of Sciences Committee on International Security and Arms Control, December 7, 1993. The Defense Counterproliferation Initiative grew out of the Bottom-Up Review (September 1993), a comprehensive review of strategy and forces that reoriented defense planning away from Cold War assumptions toward a focus on major regional contingencies. The Bottom-Up Review cited the proliferation of nuclear and other WMD as the most urgent of the new dangers facing the Nation after the Cold War.

<sup>6</sup> This objective was articulated in Office of the Secretary of Defense (OSD), “Proliferation: Threat and Response,” November 1997, 61.

<sup>7</sup> See, for example, Ashton B. Carter, “Counterproliferation Initiative: Managing Three Crises,” prepared remarks to the Conference on Nuclear, Biological, and Chemical Weapons Proliferation, May 23, 1996. The two other crises referred to are war and the dissolution of the Soviet Union.

<sup>8</sup> OSD, “Proliferation: Threat and Response,” 74.

<sup>9</sup> The White House, “Fact Sheet: Combating Terrorism—Presidential Decision Directive 62,” May 22, 1998.

<sup>10</sup> The White House, *The National Security Strategy of the United States of America* (Washington, DC: The White House, September 2002), 15.

<sup>11</sup> For an elaboration of this idea, see Jofi Joseph, “The Exercise of National Sovereignty: The Bush Administration’s Approach to Combating Weapons of Mass Destruction,” *Nonproliferation Review* 12, no. 2 (July 2005), 373–387.

<sup>12</sup> In her remarks on “Transformational Diplomacy” at Georgetown University on January 18, 2006, Secretary of State Condoleezza Rice stated that “the fundamental character of regimes now matters more than the international distribution of power.”

<sup>13</sup> Remarks by President George W. Bush on Weapons of Mass Destruction Proliferation, National Defense University, February 11, 2004.

<sup>14</sup> In May 2008, National Security Advisor Stephen J. Hadley outlined six proliferation challenges, several of which are a principal focus of the international partnership strategy discussed here. Offered late in the administration’s term in office, this may be viewed as an effort retrospectively to articulate a framework or organizing construct for the various elements of administration policy. Stephen J. Hadley, remarks at the Proliferation Security Initiative Fifth Anniversary Senior Level Meeting, May 28, 2008.

<sup>15</sup> For a detailed treatment of these and other initiatives, see Paul I. Bernstein, *International Partnerships to Combat Weapons of Mass Destruction*, Center for the Study of Weapons of Mass Destruction Occasional Paper 6 (Washington, DC: National Defense University Press, May 2008). For a recent discussion of the international law dimension, see Michael Chertoff, “The Responsibility to Contain,” *Foreign Affairs* (January-February 2009), 130–147.

<sup>16</sup> The White House, “What Does Disarmament Look Like?” January 2003.

<sup>17</sup> William J. Broad and David E. Sanger, “Iran Said to Have Nuclear Fuel for One Weapon,” *The New York Times*, November 20, 2008.

<sup>18</sup> See David Ignatius, “The Fading Jihadists,” *The Washington Post*, February 28, 2008, A17. Ignatius summarizes the recent work of Marc Sageman, a major proponent of the “leaderless jihad” hypothesis.

<sup>19</sup> This hypothesis is explored in John Mueller, *Overblown: How Politicians and the Terrorism Industry Inflate National Security Threats, and Why We Believe Them* (New York: Free Press, 2006), 179–182.

<sup>20</sup> See Ehud Sprinzak, "On Not Overstating the Problem," in *Hype or Reality?—The "New Terrorism" and Mass Casualty Attacks*, ed. Bradley H. Roberts (Alexandria, VA: The Chemical and Biological Arms Control Institute, 2000), 3–16.

<sup>21</sup> For an attempt to catalogue the technical and operational challenges to a successful act of nuclear terrorism and calculate the probability of success, see John Mueller, "The Atomic Terrorist: Assessing the Likelihood," prepared for presentation at the Program on International Security Policy, University of Chicago, January 15, 2008, available at <<http://psweb.sbs.ohio-state.edu/faculty/jmueller/overblown.html>>. In this paper, Mueller suggests 20 specific tasks that an "atomic terrorist" must successfully complete in what he labels the most likely scenario: construction of a weapon using stolen fissile material.

<sup>22</sup> John Mueller, "Terrorphobia: Our False Sense of Insecurity," *The American Interest* 3, no. 5 (May-June 2008), 7.

<sup>23</sup> By one account, the United States spends roughly one-half of one percent of gross domestic product on homeland security. See James J. Carafano, "Securing the Home Front," *The Journal of International Security Affairs*, no. 12 (Spring 2007), 54.

<sup>24</sup> The United States, Russia, United Kingdom, France, and China are recognized by the Nuclear Non-Proliferation Treaty (NPT) as nuclear weapons states. Israel, India, and Pakistan are not party to the NPT and are often referred to as de facto nuclear weapons states.

<sup>25</sup> See "North Korea's Dangerous Game," *International Institute for Strategic Studies Strategic Comments* 15, issue 5 (June 2009).

<sup>26</sup> Secretary of State Hillary Rodham Clinton, "U.S.-Asia Relations: Indispensable to our Future," remarks at The Asia Society, February 13, 2009.

<sup>27</sup> See "Washington, Seoul Seek New Way to Disarm North," *The Japan Times*, July 22, 2009, 4.

<sup>28</sup> See Choe Sang-Hun, "N. Korea Says It's Open to Dialogue," *The New York Times*, July 28, 2009.

<sup>29</sup> "U.S. Officials Worry About North Korean Proliferation," *Global Security Newswire*, May 28, 2009.

<sup>30</sup> See "The President's Inbox: The Greater Middle East," transcript of panel discussion hosted by the Council on Foreign Relations, January 23, 2009, available at <[www.cfr.org/publication/18382/presidents\\_inbox.html](http://www.cfr.org/publication/18382/presidents_inbox.html)>. This is a variant on the earlier "freeze for freeze" proposal offered by European Union negotiators in June 2008, whereby Iran would refrain from installing new centrifuges and the Western powers would refrain from taking any new action in the United Nations Security Council. This proposal never gained traction due to Iranian objections.

<sup>31</sup> See "What Now for Obama's Iran Policy?" *International Institute for Strategic Studies Strategic Comments* 15, issue 5 (June 2009).

<sup>32</sup> "Time Running Out for Iran to Join Nuclear Talks, Clinton Warns," *Global Security Newswire*, July 15, 2009.

<sup>33</sup> For a notable articulation of this perspective, see Mark Fitzpatrick, *The Iranian Nuclear Crisis: Avoiding Worst Case Outcomes*, Adelphi Paper 398 (London: International Institute for Strategic Studies, 2008).

<sup>34</sup> There are media reports of covert operations intended to sabotage Iran's nuclear infrastructure. See David E. Sanger, "U.S. Rejected Aid for Israeli Raid on Iranian Nuclear Site," *The New York Times*, January 11, 2009.

<sup>35</sup> See Kelly Campbell, "Analyzing Iran's Domestic Political Landscape," United States Institute for Peace Briefing, May 2008; and David Albright and Jacqueline Shire, "Better Carrots, Not Centrifuges: Why Iran Must Halt Enrichment and How the U.S. Can Make it Happen," Institute for Science and International Security, July 10, 2006. In the revised incentives package tabled in June 2008, the United States took a step in this direction by expressing its willingness to reaffirm its obligations under the United Nations Charter to refrain from the threat or use of force.

<sup>36</sup> See "Iranian Nuclear Work Threatens Region, Says Israeli Official," *Global Security Newswire*, January 6, 2009.

<sup>37</sup> "Iranian Election Seen Undermining U.S. Attempts at Outreach," *Global Security Newswire*, July 16, 2009.

<sup>38</sup> See Daniel R. Coats and Charles S. Robb, "Stopping a Nuclear Tehran," *The Washington Post*, October 23, 2008; and John R. Bolton, "Obama Promises Bush III on Iran," *The Wall Street Journal*, January 2, 2009.

<sup>39</sup> See, for example, Geoffrey Forden and John Thomson, "Iran as a Pioneer Case for Multi-lateral Nuclear Arrangements," Science, Technology and Global Security Working Group, Massachu-

setts Institute of Technology, 2007; Matthew Bunn, "Constraining Iran's Nuclear Program: Assessing Options and Risks," briefing dated November 15, 2007; William Luers, Thomas R. Pickering, and Jim Walsh, "A Solution for the U.S.-Iran Nuclear Standoff," *New York Review of Books* 55, no. 4 (March 20, 2008); James Miller, Christine Parthemore, and Kurt M. Campbell, "The Case for Game-Changing Diplomacy with Iran," Center for a New American Security Policy Brief, September 2008.

<sup>40</sup> In late July, Secretary of State Hillary Rodham Clinton appeared to rule out the possibility of Iran producing its own nuclear fuel through a closed nuclear fuel cycle, even under strict international controls and inspection regimes. She suggested that options short of this were possible, but was not specific. See transcript, *Meet the Press*, NBC News, July 26, 2009.

<sup>41</sup> Fitzpatrick, 84. See also Jean-Louis Gergorin, "Iran: Breaking the Deadlock," *Survival* 51, no. 3 (June-July 2009), 23.

<sup>42</sup> Risk criteria are suggested in Fitzpatrick: risk of diversion of nuclear materials and knowledge, risk of clandestine development, risk of NPT breakout, and risk of stimulating regional proliferation.

<sup>43</sup> International Security Advisory Board, 11.

<sup>44</sup> *Ibid.*, 11–12. See also Rebecca K.C. Hersman and Robert Peters, "Nuclear U-Turns: Learning from South Korean and Taiwanese Rollback," *Nonproliferation Review* 13, no. 3 (November 2006).

<sup>45</sup> Fitzpatrick, 72.

<sup>46</sup> International Security Advisory Board, 12–13.

<sup>47</sup> David Albright and Andrea Scheel, "Unprecedented Projected Nuclear Growth in the Middle East: Now Is the Time to Create Effective Barriers to Proliferation," Institute for Science and International Security, November 12, 2008. This report estimates that regional civil nuclear plutonium production could total more than 13,000 kilograms, or 13 tons, by 2020, and nearly 45 tons by 2030. Manufacturing a nuclear weapon requires only about 8 kilograms of plutonium, so these quantities are significant. Plutonium for weapons would have to be separated from irradiated reactor fuel.

<sup>48</sup> Paul I. Bernstein, John P. Caves, and John F. Reichart, *The Future Nuclear Landscape*, Center for the Study of Weapons of Mass Destruction Occasional Paper 5 (Washington, DC: National Defense University Press, April 2007), 1–2.

<sup>49</sup> This is term used in ongoing research on this topic by the Center for the Study of Weapons of Mass Destruction. This work has identified Argentina, Brazil, Japan, Kazakhstan, South Africa, and South Korea as high-capability hedgers.

<sup>50</sup> Much of this subsection and the following one on Proliferating Capabilities originally was published in *Global Strategic Assessment 2009: America's Security Role in a Changing World*, ed. Patrick M. Cronin (Washington, DC: National Defense University Press, 2009).

<sup>51</sup> Most states are members of the CWC and BWC. Only seven states have not acceded to the CWC (though two are signatories), while 35 have not acceded to the BWC (of which 15 are signatories). Most of those that have not even signed the BWC are small African or Pacific island states.

<sup>52</sup> For example, see Department of State, "Adherence to and Compliance with Arms Control, Nonproliferation, and Disarmament Agreements and Commitments," August 2005, available at <[www.state.gov/documents/organization/52113.pdf](http://www.state.gov/documents/organization/52113.pdf)>.

<sup>53</sup> As the Director General, Organization for the Prohibition of Chemical Weapons, noted in his Opening Statement to the Second Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention:

important changes are taking place. The layout, design, and characteristics of plant sites are under continued review by industry. Very importantly, globalization is bringing about a massive redistribution and regional migration of chemical production and trade in the world. In parallel with these movements, there has been an exponential growth in the number of declared Other Chemical Production Facilities (OCPFs). . . . Due to their technological features . . . a number of [these facilities] could easily and quickly be reconfigured for the production of chemical weapons. . . . This is all the more pertinent in view of the evolving threat posed by terrorism.

See <[www.opcw.org/docs/csp/rc2/en/rc2dg02\(e\).pdf](http://www.opcw.org/docs/csp/rc2/en/rc2dg02(e).pdf)>.

<sup>54</sup> As noted in the February 2008 Report of the Scientific Advisory Board on Developments in Science and Technology for the Second Special Session of the Conference of the States Parties to

Review the Operation of the Chemical Weapons Convention (Second Review Conference), “New biologically active molecules are being discovered at an unprecedented rate. The tools for such techniques are becoming widely available and could be selectively targeted at toxic materials.” See <[www.opcw.org/documents-reports/conference-of-the-states-parties/second-review-conference/?tx\\_damfrontend\\_pi1%5Bpointer%5D=1](http://www.opcw.org/documents-reports/conference-of-the-states-parties/second-review-conference/?tx_damfrontend_pi1%5Bpointer%5D=1)>.

<sup>55</sup> *Ibid.*, 11.

<sup>56</sup> Alexander Kelle noted in his introduction to a 2006 report on preventing the misuse of 21<sup>st</sup>-century chemistry, “The chemistry of the 21<sup>st</sup> Century is a far cry from the one of the 1980s. . . . The new chemistry is utilizing other scientific disciplines and technologies to a much higher degree in its quest for new chemical compounds. Alexander Kelle, “Introduction,” *The Changing Scientific and Technological Basis of the CBW Proliferation Problem*, report (edited by Alexander Kelle) of the workshop on “Preventing the Misuse of 21<sup>st</sup>-Century Chemistry: State of the Art of Drug Development and Delivery, and Selected Enabling Technologies,” Belfast, Ireland, January 13–14, 2006, available at <[www.opcw.org/docs/csp/rc2/en/rc2dg01\(e\).pdf](http://www.opcw.org/docs/csp/rc2/en/rc2dg01(e).pdf)>.

<sup>57</sup> Joint Staff, Joint Publication 3–40, *Combating Weapons of Mass Destruction* (Washington, DC: The Joint Staff, June 10, 2009), xv.

<sup>58</sup> For a more in depth discussion of WMD elimination capabilities and challenges, see Center for the Study of Weapons of Mass Destruction, *Are We Prepared? Four WMD Crises that Could Transform U.S. Security* (Washington, DC: National Defense University Press, 2009), appendix A.

<sup>59</sup> This section’s description of the Obama administration’s approach to WMD issues is drawn primarily from President Obama’s speech in Prague on April 5, 2009, available at <[www.whitehouse.gov/the\\_press\\_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered](http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered)>, and from Under Secretary of Defense for Policy Michèle Flournoy’s remarks at National Defense University on May 7, 2009 (unpublished).

<sup>60</sup> George Schultz, William Perry, Henry Kissinger, and Sam Nunn, “A World Free of Nuclear Weapons,” *The Wall Street Journal*, January 4, 2007, A15.

<sup>61</sup> The full text of Article VI of the NPT reads, “Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control.”

<sup>62</sup> The White House, “Fact Sheet: The Joint Understanding for the START Follow-on Treaty,” July 6, 2009.

<sup>63</sup> Jim Talent and Mackenzie Eaglen, “Obama’s 2010 Defense Budget: Top Five Worst Choices for National Security,” June 15, 2009, Heritage Foundation Web Memo no. 2486, available at <[www.heritage.org/research/nationalsecurity/wm2486.cfm](http://www.heritage.org/research/nationalsecurity/wm2486.cfm)>.

<sup>64</sup> Joint Statement by Dmitry A. Medvedev, President of the Russian Federation, and Barack Obama, President of the United States of America, on Missile Defense Issues, July 6, 2009.

<sup>65</sup> *America’s Strategic Posture: The Final Report of the Congressional Commission on the Strategic Posture of the United States* (Washington, DC: United States Institute of Peace Press, 2009), 41.

<sup>66</sup> *Ibid.*, xvii–xviii.

<sup>67</sup> *World at Risk, The Report of the Commission on the Prevention of WMD Proliferation and Terrorism* (New York: First Vintage Books Edition, December 2008), xxiv–xxv. The commission recommended that the “President . . . create a more efficient and effective policy coordination structure by designating a White House principal advisor for WMD proliferation and terrorism and restructuring the National Security Council and Homeland Security Council”

<sup>68</sup> Memorandum from Mark W. Lippert, Deputy Assistant to the President, Deputy National Security Advisor, National Security Council Chief of Staff, and Acting Executive Secretary, Subject: Integrated National Security Staff (NSS), June 24, 2009.

# About the Authors

*Paul I. Bernstein* is a Vice President with Science Applications International Corporation (SAIC) in McLean, Virginia. He specializes in analysis and project management in the areas of weapons proliferation, strategic forces policy, and regional security, and works with the Office of the Secretary of Defense, Defense Threat Reduction Agency, U.S. Strategic Command, National Defense University, and the Department of State on a range of policy, planning, and professional military education activities. Mr. Bernstein is a member of the Combating WMD Panel of the Department of Defense Threat Reduction Advisory Committee, has supported development of key DOD combating WMD strategy and concept documents, and is a regular guest lecturer on WMD issues at senior Service war colleges. He developed the programs of instruction for the Proliferation, Terrorism, and Response Course at the Defense Nuclear Weapons School and the WMD elective taught at the Army War College Center for Strategic Leadership. In the strategic forces area, Mr. Bernstein is engaged in a number of efforts to examine the future nuclear landscape and future directions for U.S. nuclear policy, deterrence strategy, and missile defense. He is author most recently of “Combating WMD Collaboratively,” *Joint Force Quarterly* (Issue 51, 4<sup>th</sup> Quarter 2008); *International Partnerships to Combat Weapons of Mass Destruction*, Center for the Study of Weapons of Mass Destruction Occasional Paper 6 (Washington, DC: National Defense University Press, May 2008); “Shaping the Nuclear Landscape,” *Joint Force Quarterly* (Issue 46, 3<sup>d</sup> Quarter 2007); *The Future Nuclear Landscape*, Center for the Study of Weapons of Mass Destruction Occasional Paper 5 (Washington, DC: National Defense University Press, April 2007); and “Weapons of Mass Destruction: A Primer,” prepared for the Comparative Strategic Cultures Curriculum *Assessing Strategic Culture as a Methodological Approach to Understanding WMD Decision Making by States and Non-State Actors*, October 2006. Mr. Bernstein is a member of the International Institute for Strategic Studies.

*John P. Caves, Jr.*, is a Senior Research Fellow in the Center for the Study of Weapons of Mass Destruction (WMD Center) at the National Defense University (NDU), where his work has focused on nuclear and chemical threats. Prior to joining the WMD Center in October 2003, he served as Deputy Director for Counterproliferation Policy in the Office of the Secretary of Defense (OSD). In that capacity, he played an active role in preparing U.S. forces for biological and chemical weapons threats



in the Persian Gulf region and Korea. Among his other assignments during 17 years with OSD were Country Director, Office of European Policy, and Deputy Director for Plans, Defense Security Assistance Agency. Mr. Caves holds a Master of Public Affairs degree from Princeton University, a Master of Science degree from the National War College, and a Bachelor of Arts degree from Boston College. He received the Secretary of Defense Medal for Meritorious Civilian Service and the Bronze Palm thereto; he also received the Secretary of Defense Medal for Exceptional Civilian Service. Mr. Caves is the author of “Globalization and WMD Proliferation Networks: The Policy Landscape,” *Globalization and WMD Proliferation: Terrorism, Transnational Networks and International Security*, ed. James A. Russell and James J. Wirtz (New York: Routledge, 2008); co-author of “Russia’s Cold War Perspective on Missile Defense in Europe” (Paris: Fondation pour la Recherche Stratégique, May 2007); and co-author of *The Future Nuclear Landscape* (Washington, DC: National Defense University Press, April 2007).

W. Seth Carus is a Distinguished Research Professor at NDU and the Deputy Director of the WMD Center. He has been at NDU since 1997. From 2001 to 2003, Dr. Carus was detailed to the Office of the Vice President as the senior advisor to the Vice President for biodefense. During that period he also served on the staff of the National Preparedness Review and worked with the Office of Homeland Security while it was being established after 9/11. Before joining NDU, Dr. Carus was a research analyst at the Center for Naval Analyses. From 1991 to 1994, he was a member of the policy planning staff in the Under Secretary of Defense for Policy at OSD. Before joining the government, he was a research fellow at the Washington Institute for Near East Policy. He has a Ph.D. from The Johns Hopkins University. He is author of *Defining “Weapons of Mass Destruction,”* Center for the Study of Weapons of Mass Destruction Occasional Paper 4 (Washington, DC: National Defense University Press, 2006), and co-authored with James B. Petro, “Biological Threat Characterization Research: A Critical Component of National Biodefense,” *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science* 3, no. 4 (2005), 295–308.

DR. JOHN F. REICHART

*Director*

STAFF

DR. W. SETH CARUS

*Deputy Director, Distinguished Research Fellow*

AMBASSADOR LINTON F. BROOKS

*Distinguished Research Fellow*

MR. KENNETH P. RAPUANO

*Distinguished Research Fellow*

MR. JOHN P. CAVES, JR.

*Senior Research Fellow*

DR. DAVID A. COOPER

*Senior Research Fellow*

MR. RICHARD A. LOVE, ESQ.

*Senior Research Fellow, Professor*

AMBASSADOR GREGORY L. SCHULTE

*Senior Visiting Fellow*

MR. FORREST E. WALLER, JR.

*Senior Research Fellow*

DR. ERIN R. MAHAN

*Associate Research Fellow*

MS. NATASHA E. BAJEMA

*Research Associate*

MR. M. CREIGHTON HOTTINGER

*Research Associate*

MR. ROBERT J. PETERS

*Research Associate*

DR. M. SHANE SMITH

*Research Associate*

MS. MEGAN DONOHUE

*Research Assistant*

MS. AMANDA N. DUCASSE

*Research Assistant*

MS. HEATHER VILLENA

*Research Assistant*

ONS OF MASS DESTRUCTION CENTER FOR  
MASS DESTRUCTION CENTER FOR THE STUD  
STUDY OF WEAPONS OF MASS DESTRUCTI  
OR THE STUDY OF WEAPONS OF MASS DEST  
STRUCTION CENTER FOR THE STUDY OF WE  
CENTER FOR THE STUDY OF WEAPONS OF M  
OF MASS DESTRUCTION CENTER FOR THE  
OF WEAPONS OF MASS DESTRUCTION CEN



Center for the Study of Weapons of Mass Destruction  
National Defense University  
Washington, D.C.